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Young Adult Sexual Behavior in South Africa: How Important is Parental Social Support?

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Abstract

Risky sexual behavior exposes young adults to poor reproductive health outcomes. Parental social support is associated with reduced incidence of risky sexual behavior, but this association has not been adequately investigated in South Africa. We used data from Waves 1 and 3 of the Cape Area Panel Study (a longitudinal study of adolescents and young adults aged 14-22 years and living in the Cape Town metropolitan area) to investigate the associations between parental social support and young adult risky sexual behavior in South Africa. We conducted multivariable logistic regression analyses to assess whether lack of specific categories of parental social supports at wave 1 (baseline) are associated with higher risky sexual behaviors by young adults at wave 3 (follow-up). We found that young adults who never ate meals with their mothers and those who never discussed personal matters with their fathers had increased risks of multiple sexual partnerships. Also, young adults who never got pocket money or money for gifts from their mothers had increased risk to engage in unprotected sex during their first sexual encounter. Our findings suggest that eating family meals, discussing personal matters with youth, and providing them with pocket money, may protect young adults in South Africa from risky sexual behavior. *(Afr J Reprod Health 2020; 24[1]: 35-52).*

Keywords: Young Adults, Sexual Debut, Multiple Partners, Unprotected Sex, Parents, and Social Support, South Africa

Résumé

Un comportement sexuel à risque expose les jeunes adultes à de mauvais résultats en matière de santé de la reproduction. Le soutien social des parents est associé à une incidence réduite des comportements sexuels à risque, mais cette association n'a pas été suffisamment étudiée en Afrique du Sud. Nous avons utilisé les données des Vagues 1 et 3 de la Cape Area Panel Study (une étude longitudinale sur les adolescents et les jeunes adultes âgés de 14 ans -22 ans) et résidant dans la région métropolitaine du Cap) pour enquêter sur les associations entre le soutien social des parents et les comportements sexuels à risque des jeunes adultes en Afrique du Sud. Nous avons effectué des analyses de régression logistique multivariable pour évaluer si le manque de catégories spécifiques de soutien social parental à la vague 1 (ligne de base) est associé à des comportements sexuels à risque plus élevés chez les jeunes adultes à la vague 3 (suivi). Nous avons constaté que les jeunes adultes qui n'ont jamais mangé les repas avec leurs mères et ceux qui n'avaient jamais discuté de problèmes personnels avec leurs pères présentaient des risques accrus de partenariats sexuels multiples. De plus, les jeunes adultes qui n'avaient jamais reçu d'argent de poche pour les cadeaux de leurs mères avaient un risque accru d'avoir des relations sexuelles non protégées lors de leur première relation sexuelle. Nos résultats suggèrent que manger des repas en famille, discuter des questions personnelles avec les jeunes et leur fournir de l'argent de poche peut protéger les jeunes adultes en Afrique du Sud contre les comportements sexuels à risque. *(Afr J Reprod Health 2020; 24[1]: 35-52).*

Mots-clés: Jeunes adultes, début sexuel, partenaires multiples, relations sexuelles non protégées, parents et soutien social, Afrique du Sud

Introduction

Young adult engagement in risky sexual behavior, such as early sexual debut before age 16, multiple sexual partners or unprotected sex is a major public health issue. It has been shown that early onset sexual debut is the most critical sexual behavior, since young adults who initiate sexual

activity at younger ages are more likely than those who do not, to engage in other risky sexual behaviors and are also disproportionately affected by poor reproductive health outcomes[1-4]. Multiple studies in Sub-Saharan Africa consistently found significant associations between early sexual debut and HIV infection[5], while studies in South Africa noted that, among other factors, multiple sexual partnerships and sexual debut before 16 years were strong predictors of HIV acquisition[6]. A nationally representative survey of young people in South Africa showed that 7.8% of women and 17.8% of men aged 15 to 24 years had had sexual intercourse by age 15[7,8]. Some studies found a 13% prevalence of multiple sexual partnerships among young people in South Africa[9,10]. In South Africa, the proportion of young men who reported using condoms at the last sexual encounter decreased from 85% in 2008 to 68% in 2012[11].

Rates of new HIV infections remain the highest in Sub-Saharan Africa especially among adolescents age 15 -24 years despite reductions in global HIV prevalence[12]. South Africa has the largest HIV epidemic in the world with over 270, 000 new HIV infections in 2016, representing 15% of global new infections for that year, and over a quarter of these new infections occurred among those aged 15-24 years especially females[13]. These troubling statistics call for better understanding of the psychosocial and behavioral determinants of adolescent risky sexual behaviors in SSA in general and South Africa in particular to inform the design of culturally appropriate sexual and reproductive health interventions for this group, over and above the comprehensive interventions for the population at large.

Several factors work across multiple levels of influence, interact in a complex manner to shape young adult sexual behavior[14]. Consequently, a proper articulation and understanding of the determinants of young adult risky sexual behaviors require a multisystem perspective. For this study, we were guided by Bronfenbrenner's social-ecological theory. The social-ecological models of health behavior postulate that multiple levels of contextual factors influence health behavior, at the same time these factors interact with each other across levels[15-17]. The family is the most influential microsystem within the social-ecological framework of child development[18]. Parents play critical roles in the sexual socialization and sex role development of children that last well into adulthood[19,20]. Sex roles are a set of behavioral expectations that parents hold about the attributes, characteristics, and behaviors appropriate for their children by their gender. Parents shape their children's sexual awareness and adult sex roles by emphasizing their behavioral expectations and values, shared cultural beliefs and codes of conduct regarding sexual behaviors and expressions. Parents do this through implicit and explicit messages, role modeling, and actions[19,21]. Parental social support and connectedness are the most critical processes through which parents influence the social development (e.g., self-concept and self-esteem) of their children[22].

Studies on theories of risky sexual behavior have shown that parental social support or connectedness impacts young adults' sexual behavior by its influences on mediators such as young adults' attitudes and beliefs towards sexual behavior, mental health, impulse control, academic and prosocial activities, substance use, and affiliation with sexually active peers[23,24]. Young adults with unsupportive parents, compared to those with supportive parents, were more likely to report substance use and depressed mood, which in turn are associated with affiliation with sexually active friends, permissive sexual attitudes and risky sexual behaviors[24]. It has been theorized that poor parental connectedness creates a void that is filled by more intensive association with sexually active friends. At the same time, young adults that lack parental closeness and warmth would be more susceptible to influences by peers on sexual activity[24]. Finally, supportive parental relationships provide young adults with a sense of belonging and self-worth, opportunities to develop interpersonal prosocial skills and self-regulation, and modify their beliefs and attitudes to sexual behavior[24,25].

Several studies have investigated the impact of different parenting processes such as parental monitoring and supervision, parental communication and parenting styles, on young

adults' involvement in risky sexual behaviors[26]. Some studies have found an inverse association between parental supervision alone[27-30] or between parental supervision combined with communication[31-33] and young adult risk sexual behaviors. However, most of these studies were conducted in developed nations and were mostly cross-sectional studies. Few studies have explored the protective effects of family connectedness and parental social support on young adult risky sexual behaviors[25,34-38]. Even fewer studies were conducted in Sub-Saharan Africa on the relationship between parental communication and parental monitoring and young adult risky sexual behaviors. Most of these studies showed mixed findings[31,39-41]. Empirical evidence, however, suggests that direct parental involvement in the sexual socialization of children has been minimal in most SSA countries[39]. Only one study, to our knowledge, has explored the longitudinal association between parental social support and young adult risky sexual behaviors in South Africa[42].

There are still major knowledge gaps in the association between parental social support and young adult risky sexual behavior, especially in SSA. These gaps are due to the mixed findings from the limited number of studies in SSA on this important association. Also, very few studies explored the differential effects of maternal vs. paternal support, or the type of parental support (e.g. emotional, appraisal, and instrumental support) on young adults' risky sexual behavior. The previous studies that have explored the differential maternal and paternal influences on sexual behavior yielded heterogeneous findings[43]. Hence, it is unclear which of the parental support is more likely to impact young adults' sexual behavior.

To address these gaps, we conducted a study utilizing a panel data (2002 – 2005) of 4,121 young adults in South Africa, aged 14 – 22 years to investigate the associations between parental social support (maternal and paternal) and young adults' risky sexual behavior in South Africa. We investigated the following: (1) if lack of specific categories of parental social support (i.e., emotional, appraisal and instrumental supports)[42] are associated with risky sexual behaviors by young adults, (2) whether there are differential impacts of maternal vs. paternal support on young adults' risky sexual behaviors. We hypothesize that young adults who received no social support from their parents would be more likely to engage in risky sexual behaviors compared to those that received some support. Informed by the research literature, we also hypothesize that maternal social support would be more protective of engagement in risky sexual behaviors among male adolescents compared to paternal support; and that paternal support would be more protective for female adolescents (i.e., cross-gender effects)[40,43-46].

Methods

Data Collection

This study uses data from Wave 1 (2002) and Wave 3 (2005) of the Cape Area Panel Study (CAPS) young adult questionnaire, a longitudinal study of adolescents and young adults aged 14-22 years and living in the Cape Town metropolitan area. Eligibility criteria for the young adult sample include being a member of a randomly selected household in the selected enumeration areas, and at least 14 years old at the time of interview. The sampling design, methods and population characteristics of CAPS have been discussed in detail elsewhere[42,47-54]. CAPS used a stratified multistage sampling design to select the participants for the study, first selecting enumeration areas (EA) used in the 1996 South African Census as the primary sampling units (PSUs) and then using households within each EA as the secondary sampling units. The design also used population characteristics of enumeration areas to oversample Black and White participants to generate an approximately equal sample of each racial and ethnic group (Black African, White, and Colored/Biracial). Overall, 4,752 participants were surveyed in 2002 (wave 1), and follow-up data were available for 3,536 (74.4%) in 2005 (wave 3). Wave 2 (2003/2004) does not have data on risky sexual behaviors and parental support which are the primary variables of interest in this present study. The eligible analytic sample for the current

analysis included 2,542 respondents who had not initiated sexual activity at baseline in 2002 (wave 1). The Harvard T. H. Chan School of Public Health IRB committee reviewed and approved the exempt status of our research.

Dependent variables

The wave 3 of the CAPS included items about sexual activity. The respondents were asked if they have ever had sex. Those who responded "yes" to this question were asked some follow-up questions that included: (1.) *"At what age did you first have sexual intercourse, meaning full penetration?"* We dichotomized the age at first sex into "early sexual debut" if age at first sex was before 16 years and "non-early sexual debut" if age at first sex is at or after 16 years. Different investigators have defined early sexual debut as sexual intercourse at or before age 14[55,56], at or before age 16[57], at or before age 18[4]. In this study, we defined early sexual debut as sex before age 16, based on the strong association between sex before this age and negative health and psychosocial outcomes[3,58,59], and statistical distribution of age at first intercourse in South Africa[5,60,61]. Also, because prior studies in other places such as France[62], Sweden[63], Finland[64] and the Britain[65] adopted this criterion. (2.) *"The very first time you had sex, did you or the other person use any methods to prevent pregnancy or sexually transmitted disease?"* Each respondent's answer to this question was coded as "1" if he/she answered "no" (unprotected sex) and "0" if he/she answered "yes" (protected sex). (3.) *"With how many different people have you had sexual intercourse in your whole life?"* We also dichotomized each respondent's answer into "multiple sexual partnerships" if the response was two or more partners and "monogamous sexual partnership" if the response was one partner[49].

Independent variables

Five items were included in the CAPS survey to capture the different domains (emotional, appraisal and instrumental) of parental social support. Each item on both maternal and paternal support has a set of eight response categories for frequency of occurrence of each type of social support ranging from daily or almost daily to once a week to once or twice a year to never. We constructed dichotomous values of "never" versus "ever" from these eight responses. Each respondent's answers to each question on maternal and paternal supports were coded as "1" if he/she answered "never" and "0" if he/she answered "ever." All the independent variables used in our analyses were measured at wave 1 (2002) to ensure that they preceded young adult risky sexual behaviors at wave 3 (2005). Young adults who had initiated sexual activity at wave 1 were excluded from our analytic sample.

Maternal social support

Maternal social support was assessed by asking the following questions: (1) how often has your mother spent time with just you in the past 12 months? (2) How often has your mother discussed personal matters with you in the past 12 months? (3) How often has your mother eaten meals with you over the past 12 months? (4) How often has your mother given you pocket money or money for gifts, clothes in the past 12 months? Each of these questions was treated as binary variables (never vs. ever) and modeled as independent variables on our multivariable logistic regression model. A previous study has shown that these items achieved factor loadings of 0.65 or higher onto three domains of parental social support: intimacy with parents (emotional support), lifetime parental co-residence (appraisal support), and financial support (instrumental support)[42].

Paternal social support

Paternal social support was assessed by asking the same questions as for maternal social support above.

Confounders

The sociodemographic variables included in our analyses were measured at wave 1 (2002) and they include the following: Age (Continuous), Sex (Female/Male), Race (Black/Colored/White), Education (High School or more/Less than high

school), and Household per Capita income, in quartiles (Lowest/Low-middle/Middle-higher/Highest). Age was stratified into two categories (14-17 years, and 18-22 years) for descriptive purposes (see Table 1) and employed as a continuous variable in all analyses. The other racial groups in Cape Town, including Asians, were excluded from the analyses because of very few numbers of young adults in this category. The household per capita income was derived by adding up all the monthly household income and dividing the total by the number of people in the household [42]. We also controlled for the area of Residence (Rural vs. Urban) of the adolescents.

Statistical analysis

All analyses were conducted using STATA version 12 SE[66]. The appropriate sampling weights were applied to the dataset during the analysis to account for the critical elements of the cluster sampling design – including the oversampling of Black and White households, a differential sampling of households with and without young adult members, etc.[53]. Descriptive statistics were used to examine the characteristics of the study sample in wave 1 and wave 3. Chi-square test was used to compare the sociodemographic variables of the samples at both waves, and this showed that there were no statistically significant changes in the time-invariant demographic variables such as gender and race due to attrition and non-responses (data not shown). We, then, estimated the bivariate relationship between the sociodemographic variables (wave 1) and young adult risky sexual behavior (wave 3) using chi-square test (Table 1). The distributions of parental social support according to the source of support (i.e., maternal vs. paternal support), race and sex of the young adults at wave 1 were shown in Table 2.

Furthermore, multivariable logistic regression analyses were conducted to examine the association between each of the types of maternal and paternal social supports in 2002 (wave 1) and each of the young adult risky sexual behavior in 2005 (wave 3) (Table 3). The risk ratio (RR) and the 95% confidence intervals (CI) were derived in each case. All the effect estimates were expressed as risk ratios (RR) instead of odds ratios (OR) because of the high prevalence of risky sexual behavior (>10%) among our study population. The rare disease assumption required by odds ratios have been violated, and the adjusted odds ratios derived from the logistic regression can no longer approximate the risk ratios[67]. We conducted three multivariable regression models to estimate the unadjusted, adjusted and interaction associations of each type of parental social supports and young adult risky sexual behavior. In model 1, we estimated the crude associations of types of parental social support and each sexual behavior separately for maternal and paternal support. In model 2, we adjusted for the sociodemographic variables (Table 3). Finally, we specified interaction terms to test effect measure modification of the association between parental social support and young adult sexual risk behavior by sex of young adult in model 3 (Table 3, Figures 1, 2 and 3).

Results

Socio-demographic characteristics according to young adult risky sexual behaviors

Table 1 presents the sociodemographic characteristics of the adolescents who have not initiated sexual activity at wave 1 (2002) stratified according to early sexual debut, multiple partnerships, and unprotected sex at first sex at wave 3 (2005). The mean age of the participants was 16.6 (SD 2.2) years at wave 1. About 69% of them were aged 16-17 years. Almost 55% of the participants were females, and the majority was Colored (51%) compared to Blacks (32%) and Whites (16%). A little more than half of the young adults have completed high school or more education (52%), but a majority of them (79%) lived in urban areas. A large proportion of the young adults belonged to households with per capita income in the highest (36%), and middle-higher (25%) income ranges compared to the low-middle (21%) and lowest (19%) income ranges.

Table 1 also shows that about 19% of the young adults initiated sexual activity before the age of 16; almost 48% reported multiple sexual partners and about 29% engaged in unprotected sex at their first sexual encounter at wave 3.

Table 1: Socio-demographic Characteristics of the Young Adults who have not Initiated Sexual Activity at wave 1 (2002) Stratified according to Early Sexual Debut, Multiple Sexual Partnerships, and Unprotected Sex at First Sexual Encounter, at Wave 3 (2005). N=2,542

Socio-demographic (2002) Characteristics			**Risky Sexual Behaviors (2005)**								
			Early Sexual Debut N=746			**Multiple Sexual Partnership N=838**			**Unprotected Sex at First Sex N=815**		
	Total		***Yes***	***Total***	***Chi-Sq.***	***Yes***	***Total***	***Chi-Sq.***	***Yes***	***Total***	***Chi-Sq.***
	n (%)	**Mean *(SD)***	***n (%)***	***n***	***X^2***	***n (%)***	***n***	***X^2***	***n (%)***	***N***	***X^2***
Age (continuous)	2,542 (100)	16.6 (2.2)									
Age (Categories)					10.8**			3.33			0.64
Younger (16-17)	1,752 (68.9)		115 (22.2)	519		277 (49.7)	557		149 (27.1)	550	
Older (18-22)	790 (31.1)		27 (11.9)	227		121 (43.1)	281		84 (31.7)	265	
Sex					23.4***			42.4***			11.6**
Female	1,395 (54.9)		54 (12.9)	419		176 (37.5)	469		136 (30.0)	454	
Male	1,147 (45.1)		88 (26.9)	327		222 (60.2)	369		97 (26.9)	361	
Race					25.1***			39.1***			42.2***
Black	823 (32.4)		87 (27.1)	321		216 (59.3)	364		92 (26.5)	347	
Colored	1,303 (51.3)		49 (13.9)	352		144 (36.6)	393		134 (34.3)	391	
White	416 (16.4)		6 (8.2)	73		38 (46.9)	81		7 (9.1)	77	
Education					24.4***			7.00**			0.003
High School or More	1,325 (52.2)		48 (12.3)	391		198 (43.3)	457		112 (25.6)	438	
Less than High School	1,214 (47.8)		94 (26.5)	355		200 (52.5)	381		121 (32.1)	377	
Residence					9.47**			8.12**			4.00*
Rural	522 (20.7)		50 (26.5)	189		121 (55.5)	218		50 (23.7)	211	
Urban	1,996 (79.3)		90 (16.3)	552		271 (44.3)	612		178 (31.0)	574	
Household per capita Income (in quartiles)					23.1***			2.5***			2.52
Lowest Income (R0-R233/month)	473 (18.6)		51 (29.1)	175		110 (59.5)	185		57 (30.3)	188	
Low-Middle Income (R234-R467/month)	532 (20.9)		42 (20.9)	201		119 (51.7)	230		67 (30.5)	220	
Middle-Higher Inc. (R468-R989/month)	625 (24.6)		31 (16.8)	185		82 (38.1)	215		63 (31.7)	199	
Highest Income (R990-R27,810)	909 (35.8)		18 (9.7)	185		87 (41.8)	208		46 (24.9)	185	

*Notes: * P<0.05; ** P<0.01; *** P<0.001; 3 cases (0.12%) missing education, 24 cases (0.94%) missig place of residence, 3 cases (0.12%) missing household per capita income*

The younger participants (16 – 17 years) were more likely to initiate sex early compared to the older participants (22% vs.12%, p=0.001). Higher proportions of males compared to females engaged in early debut (27% vs. 13%, p<0.001), and multiple partnerships (60% vs. 38%, p<0.001)

Table 2: Distribution of Parental Social Support according to the Source of Support (Maternal vs. Paternal), Race and Sex of Young Adult at wave 1 (2002) N=2,542

			Independent Variables at Wave 1 (2002)							
			Parent Spent Time with Young Adult		**Parent Discussed Personal Matters with Young Adult**		**Parent Ate Meals together with Young Adult**		**Parent Spent Money on Gift/ Pocket Money**	
			Never n (%)	***Total n***	***Never n (%)***	***Total N***	***Never n (%)***	***Total n***	***Never n (%)***	***Total n***
Source of Parental Social Support	**Mother**		277 (11.6)	2,402	567 (23.7)	2,395	136 (5.6)	2,414	261 (10.9)	2,395
	Father		731 (33.1)	2,212	1,107 (50.2)	2,204	578 (26.1)	2,218	649 (29.7)	2,188
	Pearson Chi-square	*t-statistic*	19.9***		27.0***		20.8***		17.2***	
Maternal Support	**Race**	*Black*	101 (13.3)	758	224 (29.6)	757	64 (8.4)	761	130 (17.2)	757
		Colored	150 (12.1)	1,239	303 (24.5)	1,237	61 (4.9)	1,243	112 (9.1)	1,232
		White	26 (6.4)	405	40 (10.0)	401	11 (2.7)	410	19 (4.7)	406
	Pearson Chi-square	*t-statistic*	13.2**		56.8***		19.0***		51.0***	
	Sex	*Female*	140 (10.7)	1,313	287 (21.9)	1,308	82 (6.2)	1,322	142 (10.8)	1,311
		Male	137 (12.6)	1,089	280 (25.8)	1,087	54 (5.0)	1,092	119 (11.0)	1,084
	Pearson Chi-square	*t-statistic*	4.16*		4.79*		1.78		0.013	
Paternal Support	**Race**	*Black*	265 (40.3)	658	378 (57.7)	655	223 (34.0)	656	266 (41.2)	645
		Colored	408 (35.1)	1,161	634 (54.8)	1,156	316 (27.2)	1,163	344 (30.0)	1,147
		White	58 (14.8)	393	95 (24.2)	393	39 (9.8)	399	39 (9.9)	396
	Pearson Chi-square	*t-statistic*	77.2***		131.2***		77.1***		116.0***	
	Sex	*Female*	424 (35.0)	1,213	659 (54.6)	1,208	336 (27.6)	1,217	376 (31.4)	1,199
		Male	307 (30.7)	999	448 (45.0)	996	242 (24.2)	1,001	273 (27.6)	989
	Pearson Chi-square	*t-statistic*	4.42*		20.01***		3.36		3.66	

*Note: * P<0.05; ** P<0.01; *** P<0.001*

at wave 3. However, more females compared to males had unprotected sex during their first sexual encounter (30% vs. 27%, p=0.001) at wave 3. Black participants were most likely to engage in early sexual debut (27%) compared to Colored (14%) and White (8%) participants (p<0.001), and multiple partnerships (59%) compared to White (47%) and Colored (37%) participants (p<0.001). Colored participants were more likely to engage in unprotected sex during the first sexual encounter (34%) compared to Black (27%) and White (9%) participants (p<0.001).

Distribution of parental social support at wave 1 (2002)

Table 2 presents the distributions of parental social support at baseline according to the source of the support (maternal vs. paternal), race and sex of the young adult. Receipt of social support differed by

Table 3: Multivariable Logistic Regression of the association between Maternal and Paternal Social Supports in 2002 and Risky Sexual Behaviors in 2005

Independent Variables Wave1 (2002)		Maternal Early Sexual Debut (2005) *RR (95% CI)*	Multiple Sexual Partnership (2005) *RR (95% CI)*	Unprotected Sex at First Sex (2005) *RR (95% CI)*	Paternal Early Sexual Debut (2005) *RR (95% CI)*	Multiple Sexual Partnership (2005) *RR (95% CI)*	Unprotected Sex at First Sex (2005) *RR (95% CI)*
Parent Spent Time with Young Adult	*Ever*	1	1	1	1	1	1
	Never	0.90 (0.47-1.74)	0.93 (0.66-1.30)	1.05 (0.63-1.74)	1.61 (0.96-2.70)	0.93 (0.67-1.28)	1.12 (0.75-1.67)
Parent Ate Meals together with Young Adult	*Ever*	**1**	**1**	1	1	1	1
	Never	**1.96 (0.93-4.15)**	**1.63* (1.10-2.43)**	0.64 (0.28-1.46)	0.93 (0.53-1.61)	0.96 (0.70-1.32)	0.78 (0.57-1.11)
Parent Discussed Personal Matters with Young Adult	Ever	1	1	1	1	**1**	1
	Never	1.25 (0.73-2.13)	1.17 (0.95-1.43)	1.11 (0.81-1.52)	0.86 (0.53-1.39)	**1.32* (1.04-1.67)**	1.15 (0.85-1.55)
Parent Spent Money on Gift/Pocket Money	*Ever*	1	1	**1**	1	1	1
	Never	0.92 (0.51-1.64)	0.85 (0.63-1.14)	**1.38* (1.02-1.87)**	1.11 (0.71-1.73)	0.93 (0.73-1.19)	1.28 (0.90-1.82)
Age		0.82** (0.72-0.95)	0.96 (0.91-1.03)	1.07* (1.00-1.14)	0.81** (0.62-94)	0.96 (0.91-1.01)	1.10* (1.02-1.19)
Sex	*Male*	2.00** (1.35-2.96)	1.84*** (1.52-2.21)	0.66** (0.52-0.84)	2.14** (1.38-3.32)	1.84*** (1.52-2.23)	0.65** (0.50-0.86)
Race	*Black*	1	1	1	1	1	1
	Colored	0.71 (0.44-1.15)	0.65*** (0.54-0.77)	2.53*** (1.78-3.60)	0.77 (0.44-1.31)	0.67*** (0.55-0.81)	2.51*** (1.70-3.72)
	White	0.40 (0.11-1.41)	0.69 (0.46-1.03)	1.45 (0.64-3.29)	0.42 (0.11-1.61)	0.75 (0.49-1.13)	1.54 (0.63-3.75)
Education	*<high School*	1.01 (0.64-1.59)	0.97 (0.79-1.19)	1.21 (0.94-1.57)	0.96 (0.60-1.55)	0.94 (0.77-1.15)	1.24 (0.93-1.65)
Residence	*Rural*	1.30 (0.75-2.25)	0.93 (0.76-1.14)	1.28 (0.90-1.81)	1.68 (0.94-3.03)	1.01 (0.81-1.25)	1.30 (0.87-1.94)
Household per capita Income (in quartiles)	*Highest*	1	1	1	1	1	1
	Mid-High	1.22 (0.61-2.43)	0.76 (0.57-1.01)	1.31 (0.89-1.92)	1.15 (0.55-2.39)	0.79 (0.59-1.07)	1.35 (0.87-2.08)
	Low-Mid	1.28 (0.63-2.61)	0.96 (0.73-1.26)	1.38 (0.92-2.05)	1.13 (0.53-2.41)	0.96 (0.74-1.25)	1.56* (1.01-2.40)
	Lowest	1.50 (0.74-3.06)	1.10 (0.83-1.45)	1.76 (1.21-2.57)	1.31 (0.60-2.89)	1.11 (0.84-1.46)	1.75** (1.15-2.65)
Interaction Terms							
Parent Spent Time with Young Adult*Sex	*Ever*	1	1	1	1	1	1
	Never	0.93 (0.42-2.00)	0.93 (0.61-1.42)	1.49 (0.73-3.06)	1.64 (0.75-3.61)	1.22 (0.86-1.74)	1.04 (0.62-1.74)
Parent Ate Meals together with Young Adult*Sex	*Ever*	1	1	1	1	1	1
	Never	0.84 (0.35-2.04)	0.65 (0.40-1.04)	0.62 (0.20-1.94)	1.30 (0.57-2.96)	1.28 (0.87-1.88)	0.62 (0.35-1.10)
Parent Discussed Personal Matters with Young Adult*Sex	*Ever*	1	1	1	1	1	1
	Never	0.79 (0.41-1.52)	0.99 (0.73-1.38)	1.60 (0.97-2.63)	1.77 (0.84-3.74)	1.30 (0.88-1.91)	0.95 (0.56-1.62)
Parent Spent Money on Gift/Pocket Money*Sex	*Ever*	1	1	1	1	1	1
	Never	2.20 (0.80-6.04)	1.05 (0.61-1.81)	0.94 (0.52-1.69)	1.45 (0.67-3.16)	1.12 (0.78-1.59)	0.78 (0.46-1.33)

*Notes: *p<0.05, **P<0.01, ***p<0.001*

the sex of the parents. The proportion of adolescents who did not receive social support from their mothers ranged from 5.6% to 24% while the range of paternal non-support ranged from 26% to 50% (p< 0.001 for maternal/paternal differences). Greater proportions of Black young adults reported non-receipt of parental social support compared to the White young adults who reported the least proportions. The proportions of the Colored young adults lie between that of the Blacks and Whites (p<0.001). Overall, there are no differences in the distribution of maternal and paternal social support according to the sex of the young adults except for *"spending time"* and *"discussing personal matters"* together. More female young adults reported that they spent time together and discussed personal matters with their fathers compared to their mothers (p=0.036 and p<0.001); while more male young adults reported that they spent time together and discussed personal matters with their mothers compared to their fathers (p=0.043 and p=0.029 respectively).

Multivariable logistic regression of the association between parental social support at baseline (2002) and early sexual debut at follow-up (2005)

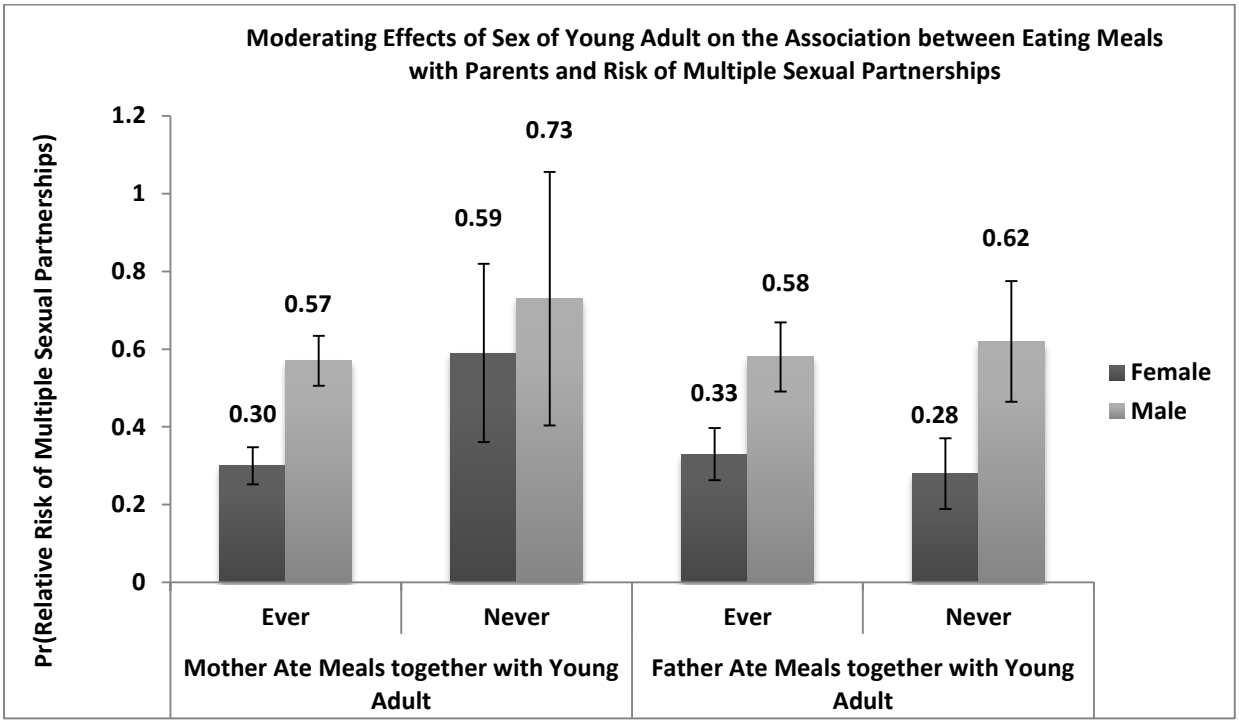
Table 3 shows the results of multivariable models estimating associations between parental social support in 2002 (baseline), and early sexual debut in 2005 (follow-up) adjusted for sociodemographic variables at baseline. Young adults who never ate meals together with their mothers at baseline have an increased risk of an early sexual debut at follow-up compared to young adults who ate meals together with their mothers at baseline (RR=1.96, 95% CI: 0.93-4.15, p=0.075). This association is, however, marginally significant. There are no significant relationships between mothers spending time together or discussing personal matters with the young adults, or spending money on gifts/pocket money for the young adult at baseline and early sexual debut by the young adults at follow-up. Also, there are no significant associations between any types of paternal social support and adolescent early sexual debut (*Father Spent Time with Young Adult: p=0.073, Father Ate Meals together with Young Adult: p=0.785, Father Discussed Personal Matters with Young Adult: p=0.543, Father Spent Money on Gift/Pocket Money for Young Adult: p=0.648).*

Multivariable logistic regression of the association between parental social support at baseline (2002) and multiple sexual partnerships at follow-up (2005)

Table 3, also shows the results of multivariable models estimating associations between parental social support in 2002 (baseline), and multiple sexual partnerships in 2005 (follow-up) adjusted for sociodemographic variables at baseline. Young adults who never ate meals together with their mothers at baseline have a statistically significant increase in the risk of multiple sexual partnerships at follow-up compared to young adults who ate meals together with their mothers at baseline (RR=1.63, 95% CI: 1.10-2.43, p=0.015). Also, young adults who never discussed personal matters with their fathers at baseline have nearly one and a half times more risk of multiple sexual partnerships at follow-up compared to young adults who discussed personal matters with their fathers at baseline (RR=1.32, 95%CI: 1.04-1.67, p=0.021). The other types of maternal and paternal supports do not have any significant statistical associations with multiple sexual partnerships.

Multivariable logistic regression of the association between parental social support at baseline (2002) and unprotected sex during the first sexual encounter at follow-up (2005)

Table 3 shows the results of multivariable models estimating associations between parental social support in 2002 (baseline), and unprotected sex during their first sexual encounter in 2005 (follow-up) adjusted for sociodemographic variables at baseline. Young adults who never received money for gifts and pocket money from their mothers at baseline have a statistically significant increase



Notes: Predicted means and 95% confidence intervals were obtained from post-estimation margins of the regression model adjusting for sociodemographic characteristics, and the interaction between statistically significant independent variables (*Parent Ate Meals together with Young Adult, Parent Discussed Personal Matters with Young Adult, and Parent Spent Money on Gift/Pocket Money*) and sex of young adult.

Figure 1: Moderating Effects of Sex of Young Adult on the Association between Eating Meals with Parents and Risk of Multiple Sexual Partnerships

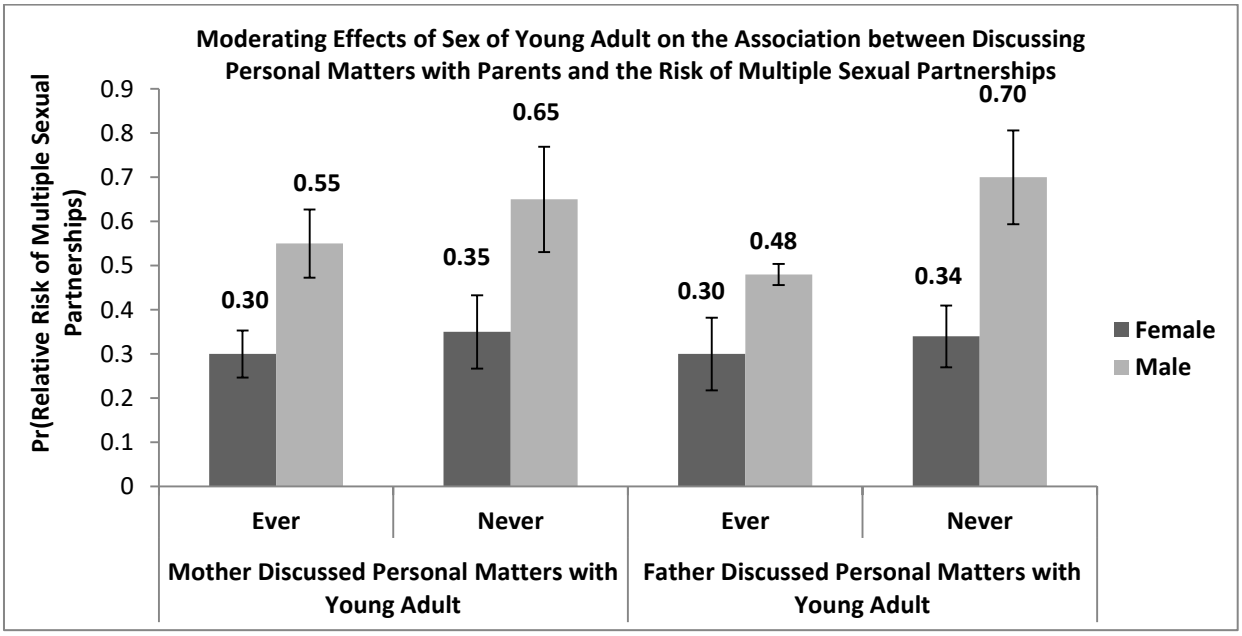


Figure 2: Moderating Effects of Sex of Young Adult on the Association between Discussing Personal Matters with Parents and Risk of Multiple Sexual Partnerships

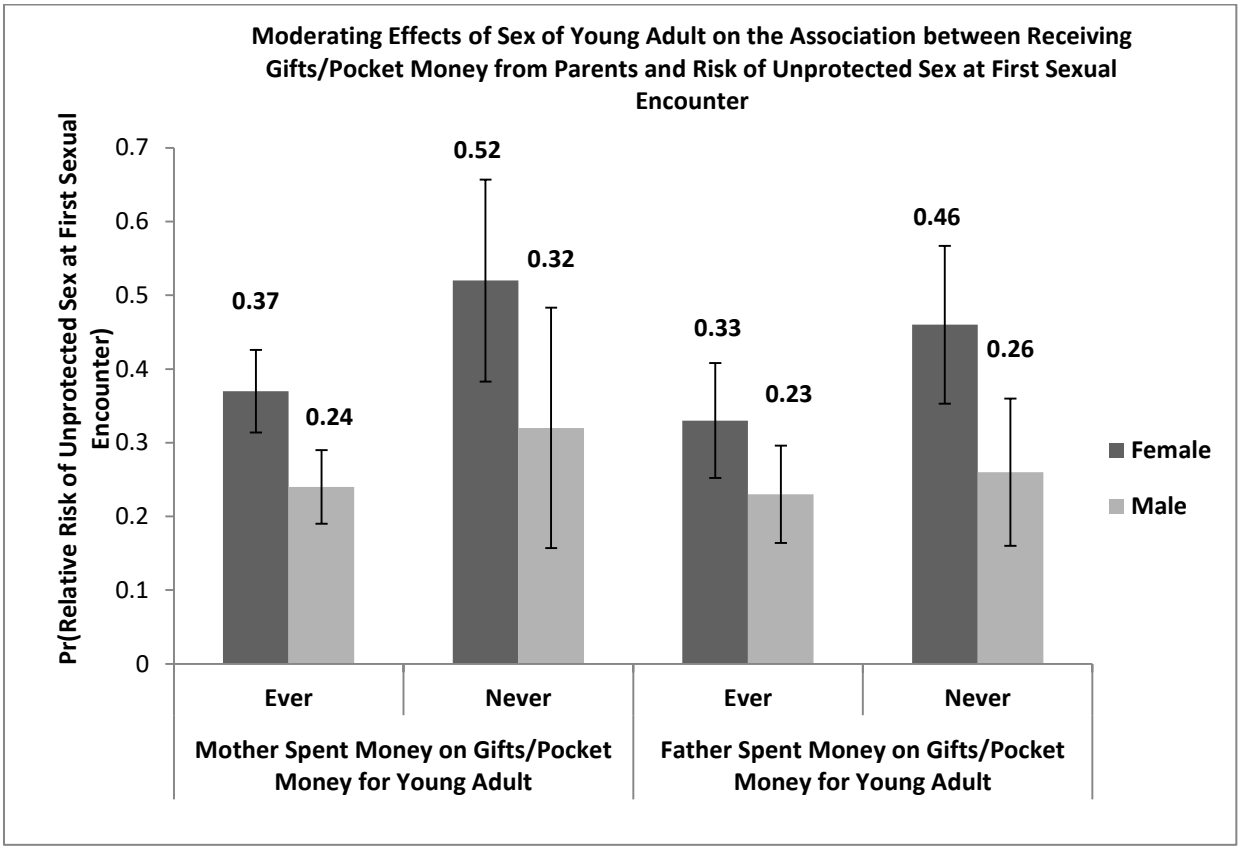


Figure 3: Moderating Effects of Sex of Young Adult on the Association between Receiving Gifts/Pocket Money from Parents and Risk of Unprotected Sex at First Sexual Encounter

in the risk of unprotected sex during their first sexual encounter at follow-up compared to those who received money from their mothers (RR=1.38, 95% CI: 1.02-1.87, p=0.039). There are no significant statistical associations between other types of parental social support and unprotected sex.

Moderating effects of sex of young adult on the associations between parental social support and young adult sexual risk behaviors

Finally, Table 3 shows that the associations between parental social support and young adult risky sexual behaviors were not moderated by the sex of the young adult. However, our analyses showed that never eating meal with parents, and never discussing personal matters with parents were associated with higher risks of multiples sexual partnerships among the male young adults compared to the female young adults (Figures 1 and 2 respectively). The risk of unprotected sex at the first sexual encounter was higher among female young adults who never received gifts/pocket money from their parents compared to their male counterparts (Figure 3). These differential effects for male young adults compared to female young adults were not statistically significant.

Discussion

This study revealed four salient findings: (1) young adults who did not eat meals together with their mothers were more likely to initiate sexual activity earlier, and have multiple sexual partners compared to those young adults who ate meals with their mothers, (2) those that did not receive pocket money or gifts from their mothers were

more likely to engage in unprotected sex compared to those that did, (3) maternal social supports are found to be more important determinants of young adult sexual behaviors compared to paternal social supports, and (4) young adults who never discussed personal matters with their fathers were more likely to engage in multiple sexual partnerships compared to the young adults who did.

First of all, our finding of a statistically significant association between family meals and young adult sexual behavior agrees with previous studies that have found consistent inverse relationships between frequent family meals and young adult high-risk behaviors such as substance use, risky sexual behavior, antisocial behavior, binge eating/purging etcetera[68-70]. Family meals are, therefore, potentially important protective factors against risky sexual behavior since eating meals together are one of the most frequent joint family activities among most families[71]. Regular family meals may provide an opportunity for parents to reconnect with their children, spend time, exchange ideas and solve problems together. At the same time, family meals contribute to the strengthening of the traditions, values, and norms that tie families together while providing meaning and identity to the children's lives as they grow[72]. Parents also have the unique opportunity to observe, monitor and assess their children's psychological state of mind, behaviors and emotional wellbeing during family meals and consequently share valuable information with them [73]. Moreover, time spent at family meals amounts to time spent away from negative peer influences while providing an opportunity for children to observe, appreciate, and model their parent's problem solving and social skills and interactions. Finally, frequent family meals provide consistency and stability in the lives of young adults in this era of pervasive social media, television and smartphone apps, thereby enhancing their self-esteem and cognitive development[74]. One study in the United States, however, found that sharing family meals were not related to early sexual debut among young adult males, or African American and Latinx adolescents[75].

Second, our results reveal that provision of money and gifts by mothers could protect young adults from unsafe sex. This finding aligns with the result from previous researchers who documented that young adults that lack parental financial or emotional support are more likely to exchange sex for money[76], and that condom use was positively associated with maternal financial support[42]. No studies, to our knowledge, have found contrary associations between parental financial support and young adult sexual risk behavior. Transactional sex promotes gender-based violence and exacerbates the gender power dynamics of relationships, making it even more difficult for girls to negotiate safe sex[77]. Also, transactional sexual practices tend to occur between young adults and older partners with financial means[77]. Research shows that between 36% and 80% of sexually active female young adults in many parts of Sub-Saharan Africa reported receiving money or gifts in exchange for sex, and there are no significant differences by household economic status, orphan status, or level of schooling completed[78]. It has been postulated that female young adults could become somewhat financially independent of their male partners when their parents provide them with some material and financial support to meet their basic needs[77]. Such young adults would be in better positions to negotiate safe sex and less likely to engage in sexual relationships based solely on monetary and material reasons.

Third, our analyses indicate that non-receipt of social supports from mothers has a statistically stronger association with young adults' sexual behaviors compared to non-receipt from fathers. Also, the impact of parental social support on sexual behavior does not differ according to the sex of the adolescent. The later finding does not align with our hypothesis of cross-gender effects. The former finding agrees with our hypothesis and reaffirms the results from previous studies which noted that mothers, compared to fathers, were more likely to have a more positive parent-child relationship and hence direct knowledge of young adults' daily activities either through active supervision or voluntary disclosure by the young adults[79,80]. A study on the

impact of orphan status on young adults' sexual behaviors in Johannesburg, South Africa found more protective effects by surviving mothers compared to surviving fathers on young adult risky sexual behavior[81]. According to our analyses, more young adults reported receipt of different types of social support from their mothers compared to their fathers. Also, in South Africa, cultural and historical issues such as the migrant labor systems and job insecurity have led to flexible living arrangements where most fathers are not co-resident with their children compared to the mothers[82,83]. The physical and emotional closeness with mothers potentially enhances the bonding between the mothers and their children and consequently engenders trust, and reduces parent-child conflicts. Another study, however, found a different pattern of influence where paternal supervision was more protective of early sexual debut among male adolescents and maternal supervision was more protective of early sexual debut among female adolescents but not vice versa[84]. On the other hand, other studies have found no gender moderation in the association between parenting/parental social support and young adult sexual risk behaviors[85,86]. A number of reasons have been adduced to explain these conflicting findings. Some scholars have hypothesized that young adult males would be more heavily influenced than young adult females by their relationship with their fathers based on the gender role theory. On the other hand, other researchers have suggested that fathers' parenting may be more responsive to contextual and relational influences than mothers' parenting due to the less prescribed cultural norms regarding men's parenting[45]. This underscores the need for continued research on the moderating effects of gender (across both children and parents) on the relationship between parental social support and young adult sexual risk behavior.

Finally, our analyses indicate that young adults who never discussed personal matters with their fathers were more likely to have multiple sexual partners compared to young adults who discussed personal matters with their fathers. This finding is in agreement with a recent review that found a consistent and significant association between father-young adult communication and reduced risky sexual behavior by young adults in the United States[26]. Although, little is known about how this process influences young adult sexual behavior due to lack of research on the role of fathers in young adult children's sexuality[26], some researchers postulate that fathers seem to be more important than mothers in promoting differentiation, individuation, autonomy and sex roles behavior and attitudes of children [43]. We are, however, not able to tell if any of these reasons are related to our findings, and this calls for more research on the role of fathers in children's psychosocial development. Other researchers found that parent-child sexuality discussions, especially with mothers, is more protective from risky sexual behaviors among girls than boys[87]. We did not find any statistically significant association between maternal-child communications and any sexual behaviors, or between paternal-child communications and the other sexual behaviors (early debut and unprotected sex). These results agree with the mixed findings from prior studies on the impact of parent-child communication on adolescent sexual behaviors[88]. Some of the reasons for our mixed findings may be attributed to methodological and conceptual issues arising from the ways these questions were structured. The questions asked the young adults to indicate how frequently they have discussed personal matters with their parents without clarification on the content and quality of these conversations. It is well known that the content, style, and timing of conversations about sexual activity between parents and their children are as important as the frequency of the communication[89].

A review of the literature from SSA, however, found inconclusive evidence to support the protective effect of parent-child communication on young adult risky sexual behaviors[31,39]. Some of the reasons for this weak association include social and cultural inhibitions against discussions on sexuality or sexual activity with unmarried adolescents in SSA. Also, many parents in SSA lack knowledge on adolescent sexuality and also lack the skills on how to talk with adolescents on safe sexual behaviors. More

often than not, parent-child communications about sexuality in Sub-Saharan Africa tend to be authoritarian, unidirectional, vague and indirect[31,39,90]. These barriers to open and effective parent-child sexuality communication in SSA may also explain the mixed findings from our study.

Strengths and Weaknesses

One of the strengths of our study is that it employed a panel data, comparing the same young adults at two time periods, to explore the impact of parental social support at baseline (2002) on risky sexual behaviors at follow-up (2005). Since this panel data spanned three years where the exposures preceded the outcomes, our study is better suited to predict the longitudinal or causal associations between parental support and young adult risky sexual behaviors compared to cross-sectional studies. To our knowledge, this is one of the very few research studies to examine the differential impact of the types of support, and sources of parental support on young adults' risky sexual behaviors in South Africa.

Some potential limitations should be considered when interpreting and weighing the results of our study. The data used for this analysis were collected in two waves with three years interval between the waves. Given that the relationship between parental social support and sexual behaviors might be highly variable over time, this long interval between waves, and attrition of respondents between the waves may result in bias. Even though our study tried to establish a temporal association between parental social support and risky sexual behavior, only two waves of data were available for analysis. A dataset with longer follow-up period would have been better given that social support is a dynamic, interactive process. Since social support is conceptualized differently by different cultures[91-94], an instrument for measuring parental social support that is developed and validated in South Africa would have been more appropriate for this study given that most social support measuring instruments were adopted from a Western perspective. Finally, social desirability or recall bias may have affected the responses since all data were self-reported. Participants were, however, told that the information they provided was confidential to minimize these biases.

Conclusion

The analysis of the panel data of over 4,000 young adults aged 14-22 year suggests that there is a complex relationship between parental social support and young adult sexual behaviors in South Africa. Overall, it appears that parental social supports are not very strong predictors of young adult risky sexual behaviors in South Africa. We postulate, therefore, that there may be other important predictors outside the family such as socio-cultural norms on gender equality and women's status in the society, poverty and low educational attainment, which are shaping the patterns of young adults' sexual behaviors in South Africa.

Despite the limitations, our research findings highlight the protective roles of eating family meals with mothers, providing material and financial support by mothers, and discussing personal matters with fathers, on young adults' risky sexual behavior. This study adds to the extant body of evidence while filling in some knowledge gaps on this very significant association especially in SSA. The strength of the impact of frequent family meals not just on sexual behaviors but also on other youth risk behaviors[68-70,73] underscores the need for future research on the different mechanisms through which family meals influence young adults' behaviors using longitudinal studies. These understandings would assist in the design and implementation of creative, evidence-based, and family-centered interventions to counter peer influences and change young adults' health behaviors and outcomes.

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Contribution of Authors

All the authors contributed actively to conceiving and designing the study, including the data analyses, interpretation of results, and manuscript preparations. All the authors have read and approved the manuscript.

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