

What is already known on this topic

Current pharmacological treatments are not appropriate for pain relief during minor procedures like venepuncture or heel prick in newborn infants

Oral sweet solutions, non-nutritive sucking, and skin to skin contact reduce procedural pain in newborn infants

What this study adds

Breast feeding during a painful procedure effectively reduces the response to pain in newborn infants

The analgesic properties of breast feeding are at least as potent as the combination of sweet solutions and a pacifier

they did not know the purpose of the study. Moreover, high agreement among observers during initial evaluations indicates objectivity. Secondly, although the DAN scale has been shown to discriminate pain in term newborn infants, no study has yet proved that it can grade the degree of perception of pain. We assumed that the more pronounced the facial expressions, limb movements, and vocal expressions, the higher the pain in the infant. Nevertheless, the robustness of pain evaluation was supported by the fact that the simultaneous use of the PIPP scale yielded similar results. Finally, median score for state of arousal was lower in the breastfeeding groups than in the other

groups. This difference was slight and in our opinion was insufficient to explain all differences observed in pain scores among groups.

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Sexual behaviour of adolescents in Nigeria: cross sectional survey of secondary school students

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Abstract

Objectives To determine whether family structure (polygamous or monogamous) is associated with sexual activity among school students in Nigeria.

Design Cross sectional school survey with a two stage, clustered sampling design.

Participants 4218 students aged 12-21 years attending 39 schools in Plateau state, Nigeria. Responses from 2705 students were included in the analysis.

Main outcome measure Report of ever having had sexual intercourse. Variables of interest included sexual history, age, sex, religion, family polygamy, educational level of parents, having a dead parent, and sense of connectedness to parents and school.

Results Overall 909 students (34%) reported ever having had sexual intercourse, and 1119 (41%) reported a polygamous family structure. Sexual activity was more common among students from polygamous families (42% of students) than

monogamous families (28%) ($\chi^2=64.23$; $P<0.0001$). Variables independently associated with sexual activity were male sex (adjusted odds ratio 2.52 (95% confidence interval 2.05 to 3.12)), older age (1.62 (1.24 to 2.14)), lower sense of connectedness with parents (1.87 (1.48 to 2.38)), having a dead parent (1.59 (1.27 to 2.00)), family polygamy (1.58 (1.29 to 1.92)), lower sense of connectedness with school (1.25 (1.09 to 1.44)), and lower educational level of parents (1.14 (1.05 to 1.24)). Multistep logistic regression analysis showed that the effect of polygamy on sexual activity was reduced by 27% by whether students were married and 22% by a history of forced sex.

Conclusions Secondary school students in Nigeria from a polygamous family structure are more likely to have engaged in sexual activity than students from a monogamous family structure. This effect is partly explained by a higher likelihood of marriage during adolescence and forced sex. Students' sense of connectedness to their parents and school, regardless of family structure, decreases the likelihood of sexual

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activity, and fostering this sense may help reduce risky sexual behaviour among Nigerian youth.

Introduction

One in five Africans and one in three African adolescents live in Nigeria, the most populous country in Africa. Nigeria's birth rate for adolescents is one of the highest in the world, and the prevalence among female adolescents in Nigeria of sexually transmitted infections, including HIV, is climbing rapidly.¹ In an effort to reduce its high maternal and infant mortality and high rates of sexually transmitted infection and dropout from school, Nigeria developed a national reproductive health policy in 2000 that focuses on preventing risky sexual behaviours during adolescence.²

The programme has been hampered, however, by outdated and incomplete information on the sexual knowledge, attitudes, and behaviours of adolescents in Nigeria. The importance of clarifying needs before intervening is highlighted by the recent evaluation of a sex education intervention in Nigeria and Ghana.³ The evaluation showed that the programme was effective for young people in school but not for young people out of school, because of differences in sexual experience and knowledge. Had the differences been recognised earlier, modification of the intervention or narrowing the target population might have improved the effectiveness and lowered the cost of the overall programme.

While such studies suggest that sexual knowledge is higher among young people out of school, sexual experience while still in school may prompt students to acquire sexual knowledge and to move out of school. In Nigeria pregnancy and motherhood mark the end of school attendance, and by age 16 years 21% of female adolescents are either pregnant or have given birth.¹ The most recent national data from Nigeria indicate that 30% of female and 36% of male adolescents are enrolled in secondary school. Therefore closing the gap between the sexes is only the first of many steps to increase access to school among all young people in Nigeria.⁴

The impact of family and school on adolescent health has been shown repeatedly by studies in North America and western Europe.⁵⁻⁸ The countries producing this research, however, differ dramatically from Nigeria and most countries of Africa in family structure, school attendance, and educational attainment. Polygamy, defined as the marriage of one husband to two or more wives simultaneously, is one of the most striking differences, with 30-50% of adults in Nigeria reporting current or past polygamy.⁹ Compared with families in which the parents are monogamous, in families in Africa with a polygamous structure the age at which female children first get married is lower, the age difference between spouses is greater, husbands and wives have completed fewer years of school, children have more problems related to school, and adolescents have more substance misuse.¹⁰⁻¹⁴ No studies published in Nigeria or elsewhere, however, have explored the effects of polygamy on adolescent sexual behaviour or reproductive health. This study's primary objective was to determine whether family structure (monogamous or polygamous) is associated with initiation of sexual intercourse among adolescents in Nigeria and, if so, to identify characteristics of the family that mediate the association.

Methods

Background

Nigeria has 126 million people in more than 250 ethnic groups. The major languages are English (official language), Hausa, Yoruba, Igbo, and Fulani. Most of Nigeria's 36 states adhere to English common law, though Islamic law is practised in some northern states. Since the 1999 restoration of a civilian government—after nearly 30 years of military dictatorship in the four decades since independence—Nigeria has struggled with social and political unrest. The prevalence of HIV/AIDS has increased steadily through the 1990s, maternal and infant mortality are high, and the average life expectancy is 51 years.²

Survey site and participants

The study took place in Plateau state, in central Nigeria, from 10 March to 24 March 2000 (see bmj.com for details). We used a clustered sampling design to select government funded secondary schools in the first stage and students in the second stage. In all, 90 307 secondary students were enrolled in 185 schools in Plateau state; the study sample consisted of 4218 students in 39 schools.

Questionnaire

A self administered, English language questionnaire comprising 96 multiple choice items was developed for the study.¹⁵⁻¹⁷

Data analysis

The primary outcome measure was sexual intercourse ever (sexual activity), defined as a "yes" response to the question "Have you ever had sexual intercourse (sex with another person)?" Family polygamy was defined as a "yes" response to either or both of the questions "Has your father ever had more than one wife at the same time?" and "Have you ever lived in a household where two or more women were married to one man at the same time?"

Multi-item variables such as parent-teen connectedness, parent-teen activities, and parental presence (see bmj.com) were adapted from the US national longitudinal study on adolescent health.¹⁷ Higher scores represented more desirable conditions. Responses of students who answered <75% of the items in a set were excluded from analyses of the given variable. Missing responses for students who answered $\geq 75\%$ were assigned the student's mean score for the set.

We used logistic regression to estimate the probability of sexual activity as a function of family polygamy, adjusting for the four design effects: school group, school type (coeducational, same sex, day, boarding), and age and sex of the participant (see bmj.com for detailed modelling strategy).

Results

Baseline characteristics of the 2705 participants whose responses were included in the analysis were compared with those of the 1513 students whose answer sheets did not meet inclusion criteria. The included students were older, in higher school grades, and more likely to live in cities and to identify themselves as Christian than excluded students (see bmj.com). They did not differ from excluded students, however, by sex or by type of school.

Sexual activity was less common among female than male students (table 1), less common among female students attending female only boarding schools than other schools (7.7% versus 24.3% ($\chi^2=11.38$; $P=0.0008$)), and less common among students living in urban rather than rural locations. The mean age of sexual initiation was 14.8 (SD 2.8) years overall: 14.6 (2.8) for male students and 15.2 (2.6) years for female students ($\chi^2=1.49$; $P=0.002$). Older age but not level of class in school was associated with sexual activity. The data suggest that sexual initiation is more likely at age ≤ 12 years than it is between 12 and 14 years. The proportion of students reporting sexual activity did not differ between Christian and Muslim students. The proportion of students reporting sexual activity increased as religious importance decreased.

Family polygamy, whether a parent was dead, and lower educational level of parents were associated with sexual activity. Family polygamy was reported by 1119 students overall (41.4%). The proportions of students reporting sexual activity were 42.3% in students from polygamous families and 27.5% in students from monogamous families. Sexually active students had lower mean scores for parent-teen connectedness, parent-teen activities, parental presence, and school connectedness (see bmj.com).

Of students who reported having had sexual intercourse, 57.1% of 619 male students and 48.3% of 289 female students said they had had more than one sexual partner; 53.5% and 61.2% had used condoms or other birth control; 30.5% and 38.4% had been treated for a sexually transmitted disease, and 22.7% and 24.5% had been treated for HIV/AIDS. Forced sexual intercourse was reported by 32.0% of male students and 45.0% of female students, and sex in exchange for food, money, drugs, or shelter by 26.1% and 32.6%. Of 183 male students who reported having been forced to have sexual intercourse, 79 (43.2%) reported a history of sex with a person of the same sex, compared with 103 of 383 (26.9%) who reported no forced sexual intercourse.

Logistic regression modelling of sexual activity as a function of family polygamy gave an odds ratio of 1.58 (95% confidence interval 1.29 to 1.92), after adjustment for the four design effects. The best subset of variables predicting sexual activity were male sex, lower parent-teen connectedness, older age, having a dead parent, family polygamy, lower school connectedness, and lower parental education (table 2).

Discussion

The findings confirm the primary hypothesis that sexual activity is more common among adolescents from polygamous families. Marriage and forced sexual intercourse are common among Nigerian school students and may help explain the association between family polygamy and sexual initiation before or during adolescence.

Limitations of the study

Non-random selection of participants in some schools may have resulted in a sample that did not represent the population of secondary school students in Plateau state. Furthermore, although Plateau state is broadly representative of Nigeria, it is just one of 36 states in the country. The sociodemographic profiles of

Table 1 Number (%) of students who reported or denied ever having had sexual intercourse

Characteristic	Sexual intercourse ever		χ^2	P value
	No	Yes		
Total	1796 (66.4)	909 (33.6)		
What is your sex?			113.17	<0.0001
Male	832 (57.3)	619 (42.7)		
Female	955 (76.8)	289 (23.2)		
How many years old were you on your last birthday?			35.44	<0.0001
12-14	463 (72.2)	178 (27.9)		
15-17	755 (69.2)	335 (30.8)		
18-21	575 (59.3)	394 (40.7)		
What class are you in?			5.48	0.36
Junior 1	128 (66.3)	65 (33.7)		
Junior 2	289 (63.0)	170 (37.0)		
Junior 3	341 (68.5)	157 (31.5)		
Senior 1	408 (68.2)	190 (31.8)		
Senior 2	337 (67.0)	166 (33.0)		
Senior 3	281 (64.0)	158 (36.0)		
Type of school:			29.64	<0.0001
Coeducational day	1306 (66.7)	652 (33.3)		
Coeducational boarding	265 (62.5)	159 (37.5)		
Male boarding	144 (61.3)	91 (38.7)		
Female boarding	73 (92.4)	6 (7.6)		
How would you describe the place where you live?			17.31	0.0002
City or town	1221 (68.7)	556 (31.3)		
Village	446 (61.0)	285 (39.0)		
Nomad	61 (57.6)	45 (42.5)		
What is your religion?			11.38	0.0098*
Christianity	1582 (67.0)	781 (33.1)		
Islam	202 (63.5)	116 (36.5)		
Other	2 (20.0)	8 (80.0)		
None	1 (50.0)	1 (50.0)		
How important is religion to you?			44.37	<0.0001
Very important	1757 (67.6)	844 (32.5)		
Important	27 (40.3)	40 (59.7)		
Not important	5 (20.8)	19 (79.2)		

*No significant difference between Christianity and Islam in the rates of sexual activity.

excluded and included students differed, and their sexual behaviours and family structures may also have differed. Under-reporting of sexual activity by school students in Nigeria is likely, given the harsh societal reaction to behaviours that are deemed sexual offences in much of the country. Female students who are pregnant or who have had babies typically leave school. Given Nigeria's low use of contraception and high birth rates, such dropout from school is likely to skew the female student population towards students who are sexually inactive. Finally, the study collected data only from adolescents in school. In a country where less than a third of adolescents attend school, the results cannot be generalised to all adolescents nationwide.

Table 2 Variables that best predict students ever having had sexual intercourse (results of stepwise logistic regression model)

Variable	Adjusted odds ratio (95% CI)
Male sex	2.52 (2.05 to 3.12)
Lower parent-teen connectedness	1.87 (1.48 to 2.38)
Age 18-21 years	1.62 (1.24 to 2.14)
Having a dead parent	1.59 (1.27 to 2.00)
Family polygamy	1.58 (1.29 to 1.92)
Lower school connectedness	1.25 (1.09 to 1.44)
Lower education level of parents	1.14 (1.05 to 1.24)

What is already known on this topic

In 2000 Nigeria developed a national health policy aimed at preventing behaviour among adolescents leading to sexually transmitted infections (including HIV), pregnancy, and dropout from school

Effective interventions in Nigeria have been hampered by inadequate information on contextual factors associated with sexual behaviour of adolescents

In Western countries adolescents' sense of connectedness to their parents and to school is inversely associated with risky sexual behaviour, but these effects may differ in countries where polygamy is prevalent and where school attendance is low

What this paper adds

A polygamous family structure is associated with early sexual activity among adolescents, an effect partly explained by a higher likelihood of marriage and history of forced sexual intercourse

A greater sense of connectedness to parents and school decreases the likelihood of sexual activity, regardless of family structure

Cross-country comparisons

There is evidence in developed and in developing countries that acknowledging the sexual activity of adolescents and meeting their sexual health needs with targeted education and preventive care services can help reduce risky sexual behaviour and its consequences.^{18, 19} The sexual health needs of young people in Nigeria are high, as evidenced by the prevalence of pregnancy and sexually transmitted disease, including HIV/AIDS. By age 13 years over a quarter of the students in our study were sexually active. Among US students surveyed in the same year (1999), sexual activity by age 13 years was reported by 5.5% of white students, 20.5% of black students, and 9.2% of Hispanic students. Whereas 39% of female students in our study had had a past or current pregnancy, the rate among female high school students in the United States in the same year was 7.6%.¹⁶

Conclusions

The findings of our study can help programme planners in Nigeria tailor prevention strategies to the needs of adolescent school students but should not be generalised to adolescents who are out of school. Work that advances our understanding of the contexts of time, place, and people around adolescents in Nigeria is needed if we are to interpret international research correctly and plan interventions that are appropriate and effective.

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Competing interests: None declared.

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Corrections and clarifications

Managing acute renal colic across the primary-secondary care interface: a pathway of care based on evidence and consensus

The authors of this article, P J Wright and colleagues, have alerted us to an error in the figure illustrating the pathway for managing acute renal colic (14 December, pp 1408-12). The first box should read: "Acute flank pain and symptoms suggesting renal colic—that is: abrupt onset; severe unilateral loin pain radiating to groin and genitals; previous episode(s) of renal colic." The second footnote should read: "Ultrasound scanning of kidney, ureter, and bladder is now being superseded by spiral computed tomography [not spiral CT urography]."

Letters: summary of responses

Two errors occurred in Birte Twisselmann's summary of rapid responses (12 October, p 838) in relation to Drake et al's lesson of the week (*BMJ* 2002;324:1081-3). She said that Minna Kalla stated that instead of high doses of steroids, long acting β agonists or leukotriene receptor antagonists should have been given as second line treatment. In fact, Kalla (who comes from Tampere, which is of course in Finland, not Sweden as we stated) was trying to raise the following question: "Why hasn't the usual strategy (in, for example, treatment of rheumatoid arthritis) of combating the effects of steroids by less frequent dosing (that is, every other day) ever been studied in patients with asthma?" (See www.bmj.com/cgi/eletters/325/7368/836/a#26476)