Sexual behaviour of Cape Town high-school students

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Objectives. To document prevalence rates for selected aspects of sexual behaviour among Cape Town high-school students and to conduct a survival analysis of age at first intercourse.

Design. Cross-sectional survey.

Setting. State high schools in Cape Town.

Subjects. A multistage cluster sample of 2 740 grade 8 and 11 students at 39 schools.

Outcome measures. Ever having had sexual intercourse; for those who had, age at first intercourse, number of partners during the previous 12 months, time since last intercourse; and, at last intercourse, whether the partner had been known for more than 7 days, whether any method was used to prevent pregnancy or disease, and (if so) what was used.

Results. Overall, 29.9% had participated in sexual intercourse,

with a higher proportion among males and those in grade 11. By the age of 14 years, 23.4% of males and 5.5% of females had participated in sexual intercourse. By the age of 19 years, these proportions were 71.8% and 58.2% respectively. The median time since last intercourse was 4 weeks, the median number of partners in the past year was 1, and 78.4% had known their most recent partner for more than 7 days. At their last coital episode, 65.4% had used contraception, and the most common methods were condoms and injectable steroids, which were used by 67.7% and 43.2% respectively.

Conclusions. The proportion of sexually active students has increased since 1990. Intervention programmes should commence in primary school. Large numbers of students are at risk for pregnancy and sexually transmitted infections.

S Afr Med J 2003; 93: 537-541.

Data on sexual behaviour of adolescents is of critical importance in formulating an appropriate response to the AIDS epidemic. Data are essential in order to track secular behavioural changes and to inform the development of intervention strategies. Most South African studies of adolescent sexual behaviour are limited by methodological factors such as: (*i*) small samples that are not representative of the adolescents in a specific health district, region or province; (*ii*) failure to address the sampling strategy in the statistical analysis; and (*iii*) reliance on cross-sectional information.[1] Reliance on cross-sectional information makes it difficult to draw conclusions about the age of first intercourse as the mean age of first intercourse will be influenced by the current age of the students. Among older students, for example, first intercourse will inevitably be later than among younger students as more students would have had the opportunity to become sexually active at an older age.

In the Cape Town Metropolitan Health Region the only study that aimed to provide prevalence rates for sexual behaviour based on a large representative sample of high-school students was conducted in 1990 (but reported in 1993).[2]

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Adolescents are living in a dynamic psychosocial environment and their behavioural choices and preferences depend on prevailing social influences. There have been considerable changes since 1990 in the social influences that could determine the sexual behaviour of South African adolescents. The changes include the formal end of apartheid, the accompanying increase in social liberty and access to information, and transformation of the education and health systems; HIV education programmes; massive urbanisation;[3] and the precipitous increase in prevalence rates of HIV itself and other sexually transmitted infections.

The current study provides data on the sexual behaviour of a representative sample of high-school students in the Cape Town Metropolitan Health Region. Our analytical strategy took account of the multistage sampling strategy. We used survival analysis to conduct an event analysis of first sexual intercourse. This enabled us to circumvent the limitation of cross-sectional studies by providing estimates of this age that are not biased by the current ages of the study participants.

Methods

Population and sample

The study population included all students in grades 8 and 11 attending public schools in Cape Town. Schools were stratified by postal code groupings, and 39 schools were selected such that the proportion of selected schools in a selected stratum was directly proportional to the number of students in that

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stratum. Within each stratum, the selection probability of a school was proportional to the number of students in that school. Forty students were randomly selected from the combined class list of two randomly selected classes from each participating grade.

Procedure

The selected students completed a self-completed questionnaire during a normal school period. The seating was arranged so that confidentiality was preserved. School staff were not present during administration of the questionnaire. No student refused to participate in the study.

Instrument

The questionnaire has been used in a number of previous studies[2,4,5] and has been subjected to extensive pilot studies in small groups and classrooms. The first question involving sexuality was 'Have you ever had sexual intercourse? This means intimate contact with someone of the opposite sex during which the penis enters the vagina (female private parts).' Students answering affirmatively to this question were asked a number of contingent questions involving: (*i*) age at first intercourse; (*ii*) number of different sexual partners during the previous 12 months; (*iii*) time since last intercourse; and (*iv*) whether on the last occasion of intercourse they had known their partner for more than 7 days, and whether they or their partner had used anything to prevent pregnancy or disease. If they had used something to prevent pregnancy or disease, they were asked which of a list of options they had used.

The questionnaire was translated from English into the other main languages spoken in Cape Town (Afrikaans and Xhosa) and then back-translated by other people who had these languages as home language. Students were asked if they had used a fictitious substance ('Derbisol'), and the 5 students who responded positively to this item were excluded from the study. A previous study[4] among students attending independent high schools in Cape Town reported a substantial[6] test-retest reliability for the item involving whether the respondent had ever experienced heterosexual intercourse (Cohen's kappa[7] = 0.80, 95% confidence interval (CI): 0.70 - 0.90).

Analysis

We used the Survey Data Analysis (SUDAAN)[8] programme to calculate proportions, medians and means with 95% CIs taking the multistage stratified design into account. We used the without-replacement design option. The design stages were postal code area, school and grade. We computed sampling weights using the number of students in the school, the number of students in the grade (in a specific school) and the number of students sampled from the grade. We calculated prevalence rates for contingent questions as ratios of the number of students who engaged in the activity to the number of students who answered affirmatively to the main question (either having had intercourse or having used something to prevent pregnancy or disease). In computing CIs for medians we used a large sample approximation.[9]

We compared the results for each gender (within each grade) and for each grade (within each gender). In comparing two groups, if the 95% CIs do not overlap, there is a significant ($p < 0.025$) difference between the groups. If the CIs overlap, but not to the extent that the point estimate of one group is contained within the CI of the other group, there is a significant ($p < 0.05$) difference between the groups. If they overlap to the extent that the point estimate of one group is contained within the CI of the other group, we cannot draw any conclusions as to whether there is a significant difference between the groups.

Survival analysis was done to estimate the cumulative incidence of intercourse in the sample as a whole and also within each gender. The reported age at first intercourse was used as the time to the event in the survival analysis. Students who reported not having experienced sexual intercourse were censored at their reported current age. The Kaplan-Meier product limit method was used to estimate the incidence curve and the corresponding confidence limits. The log-rank statistic was used to compare survival distributions.[10] The data were right censored at the current age. Left censoring was not addressed in the survival analysis since all the students who indicated that they had experienced sexual intercourse provided an age at first intercourse.

Results

Data were available for 2 740 students, of whom 1 599 (58.4%) were female and 1 356 (49.5%) were in grade 8. Among males, 23.2% (CI: 18.0 - 28.3) in grade 8 and 57.8% (CI: 51.0 - 64.6) in grade 11 had experienced intercourse. Among females, the corresponding percentages were 10.8% (CI: 7.4 - 14.1) and 42.8% (CI: 37.3 - 47.8). For each gender there was a substantial increase in the proportion of students who had experienced sexual intercourse between grades 8 and 11. For each grade, a significantly ($p < 0.025$) higher proportion of males had experienced sexual intercourse.

The results of the survival analysis of age at first intercourse are presented in Table I and Fig. 1. The difference between males and females was statistically significant ($\chi^2 = 84.29$, df = 1, $p < 0.0001$).

For the total sample, the median time since the last episode of intercourse was 4 weeks (CI: 3 - 4); the median number of partners in the past year was 1 (CI: 1 - 1); and 78.4% (CI: 74.9 - 81.9) had known their partner for more than 7 days. Grade 11 males had had significantly more partners in the previous 12 months than grade 11 females ($p < 0.025$) (Table II).

Table I. Survival analysis of age at first intercourse

Percentage who have had intercourse (95% confidence interval)

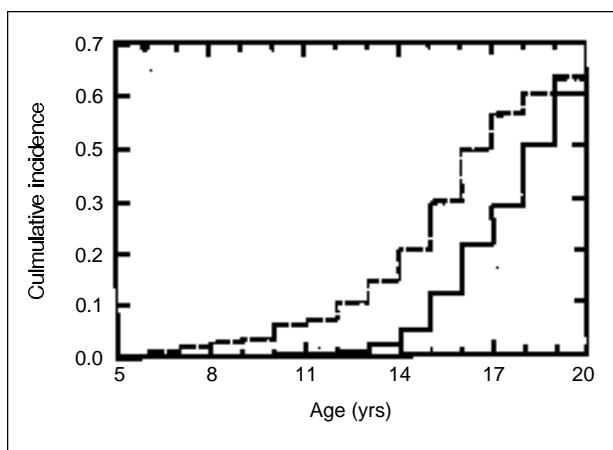| Age (years)	Males (N = 450)	Females (N = 429)
10	7.1 (6.0 - 8.3)	0.4 (0.2 - 0.7)
11	8.0 (6.8 - 9.2)	0.5 (0.3 - 7.9)
12	11.9 (10.5 - 13.4)	0.9 (0.6 - 1.3)
13	16.4 (14.8 - 18.0)	2.3 (1.8 - 3.0)
14	23.4 (21.5 - 25.3)	5.5 (4.6 - 6.3)
15	34.5 (32.1 - 36.8)	13.8 (12.3 - 15.3)
16	45.9 (43.2 - 48.5)	24.5 (22.5 - 26.5)
17	53.7 (50.7 - 56.8)	33.2 (30.7 - 35.7)
18	58.3 (54.8 - 61.8)	47.1 (43.6 - 50.7)
19	61.8 (57.8 - 65.9)	58.2 (53.8 - 62.6)
20	67.7 (62.6 - 72.8)	64.9 (59.7 - 70.1)

Fig. 1. Cumulative incidence of first intercourse in males (dotted line) and females (solid line).

Grade 11 females were significantly more likely to have known their partner for more than 7 days than: (*i*) grade 8 females ($p < 0.05$); and (*ii*) grade 11 males ($p < 0.025$).

Of the total sample, 65.4% (CI: 60.3 - 70.5) reported that they or their partners had used something to prevent pregnancy or disease during their last coital episode. Grade 11 females were significantly more likely to use contraception than: (*i*) grade 8 females ($p < 0.05$); and (*ii*) grade 11 males ($p < 0.025$) (Table II). In addition, grade 11 males were significantly more likely to use contraception than grade 8 males ($p < 0.05$).

The proportions using each type of contraception at last intercourse were as follows: condoms, 67.6% (CI: 63.5 - 71.7); injectable steroids, 43.2% (CI: 36.3 - 50.1); and oral contraceptives, 12.7% (CI: 9.4 - 16.0). The remaining methods were used by less than 3% of the sample.

Condoms were used by a greater proportion of males than females in both grade 8 ($p < 0.025$) and grade 11 ($p < 0.05$) (Table III). However, injectable steroids were more likely to be used by females in both grade 8 ($p < 0.025$) and grade 11 ($p < 0.05$). Grade 8 males were more likely to use condoms than grade 11 males ($p < 0.05$), whereas grade 11 males were more likely to use injectable steroids than grade 8 males ($p < 0.05$). For females, the converse findings were obtained. Grade 11 females were more likely to use condoms than grade 8 females ($p < 0.025$), and grade 8 females were more likely to use injectable steroids than grade 11 females ($p < 0.05$). For oral steroids, the only significant difference was that grade 11 females were less likely to use them than grade 11 males ($p < 0.05$).

Discussion

The results confirm that a large proportion of high-school students in Cape Town have experienced sexual intercourse. Furthermore, there has been a significant increase in the

Table II. Selected characteristics (95% confidence interval) of those who had experienced sexual intercourse (N = 879)*

	Males		Females	
	Grade 8 N = 133 % (CI)	Grade 11 N = 317 % (CI)	Grade 8 N = 83 % (CI)	Grade 11 N = 346 % (CI)
Weeks since last intercourse (median) (median)	4 (3 - 7)	4 (3 - 4)	3 (1 - 4)	3 (3 - 4)
No. of partners in past 12 months (median)	1 (1 - 2)	2 (2 - 2)	1 (1-1)	1 (1 - 1)
% knowing last partner > 7 days	71.4 (64.0 - 78.8)	73.6 (67.7 - 79.5)	75.6 (63.1 - 88.1)	88.3 (84.4 - 92.2)
% using contraception at last sex	50.5 (41.0 - 60.0)	61.8 (55.1 - 68.5)	64.6 (49.5 - 76.8)	77.7 (72.2 - 83.2)

* There were 12 cells with 1 - 10 missing values, 5 with 11 - 20 missing values and 3 with 21 - 30 missing values.

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Table III. Prevalence rates with 95% confidence intervals for use of selected contraceptive methods, stratified by gender/grade (N = 565)*

	Males		Females	
	Grade 8 (N = 63) % (CI)	Grade 11 (N = 191) % (CI)	Grade 8 (N = 51) % (CI)	Grade 11 (N = 260) % (CI)
Condoms	86.8 (78.4 - 95.2)	75.3 (66.7 - 83.9)	40.2 (32.7 - 47.7)	62.1 (56.0 - 68.1)
Injectable steroids	16.6 (1.7 - 31.5)	35.8 (26.2 - 45.4)	71.7 (56.4 - 87.0)	51.0 (43.0 - 59.0)
Oral steroids	12.3 (4.5 - 20.1)	17.6 (11.7 - 23.5)	8.5 (0.7 - 16.3)	10.3 (6.4 - 14.2)

* Data on contraceptive method were missing for 9 students.

proportion who have experienced intercourse for both genders and both grades compared with 1990 ($p < 0.025$, except for grade 8 females where $p < 0.05$). In the previous study of Cape Town high-school students mentioned above,[2] 14.1% (CI: 11.5 - 16.6) and 27.0% (CI:21.5 - 32.5) of males, and 6.8% (CI: 4.5 - 9.0) and 18.6% (CI: 12.8 - 18.6) of females, grades 8 and 11 respectively, had experienced sexual intercourse. Possible explanations for this increase include demographic shifts in the population of Cape Town high-school students, more valid questionnaire responses due to less restrictive attitudes to sexuality and secular changes in sexual behaviour. Whatever the reasons for the increase, the results underscore the urgent need for school-based HIV prevention programmes.

By grade 8, 10.8% of females and 23.2% of males had already experienced intercourse. Furthermore, there was a significant increase in the proportion of students who had participated in sexual intercourse from grade 8 to grade 11, with the proportion among females increasing almost four-fold. The survival analysis of age at first intercourse provides consistent results. Specifically, by the age of 14 years, 23.4% of males and 5.5% of females had experienced sexual intercourse. However, the gender differences in the proportions that had experienced sexual intercourse diminished, and by the age of 19 years were no longer significant. The increase was therefore steeper for females; for example, the proportion increased six-fold between the ages of 14 and 17, whereas for males the proportion increased less than three-fold. These findings underscore the urgent need to increase intervention efforts that aim to postpone first intercourse. Such efforts should commence in primary school, especially for males.

This study is consistent with the 1990 study[2] and other South African research[1] in that it confirms that students who have ever had sex generally do so infrequently, do not have multiple partners, and have known their partners for more than a week. Health promotion efforts should build on these positive health behaviours, and find ways to maintain them. Maintaining existing behaviours may be a less daunting challenge than initiating new behaviours. Also, the fact that the majority of

students are not engaging in risk behaviour in these respects can be used in intervention efforts aimed at the minority who are doing so.

Subjective norms are an important predictor of sexual behaviour.[11-13] Thus, if students believe that the norm among their peers is to engage in a risk behaviour such as having multiple partners, this may increase the probability of their following this perceived precedent. One can aim to rectify false subjective norms by presenting the students with valid information, such as the results of this project. This may reduce the extent of unsafe sexual behaviour.

In 1990, 48.1% (CI: 37.3 - 58.9) of grade 8 females used contraception on their last coital episode, which was significantly less ($p < 0.05$) than the proportion in the current study. There were no significant changes for any other gender/grade group. Even though the majority of students in each gender/grade group reported taking preventive measures, it is still cause for concern that many are exposing themselves to risk of pregnancy and disease. Also, the present study provided no data on the frequency with which steps were taken to prevent pregnancy or disease. It is probable that many students who did something to prevent pregnancy or disease on their last coital episode did not always do so. Finally, none of the methods used is reliably protective against both pregnancy and disease. Injectable contraceptives, for example, were a frequently used method; among sexually active grade 8 females who used contraception, for example, 71.7% used injectable steroids. While such females are protected against pregnancy, they are not protected against disease. Indeed, it is possible that injectable contraceptive use can contribute to an increase in sexually transmitted diseases since protection against pregnancy in this manner may remove a barrier to having sexual intercourse.[14]

The differences between males and females in terms of contraceptive method, with more males using condoms and more females using injectable steroids, may be partly accounted for by poor communication in that males may not have been aware that their partners had received contraceptive

injections. However, grade 11 males were more likely to report that their partners used injectable contraceptives than grade 8 males. It is therefore possible that the communication between partners improved between grade 8 and grade 11. For females, the proportion using condoms increased from grade 8 to grade 11. This may reflect an increasing awareness of the need to protect against HIV and other sexually transmitted diseases or an enhanced capacity to negotiate condom use with their partners. All these explanations are speculative. Intervention efforts will benefit from future studies that aim to understand the predictors of contraceptive choice in this population.

This study has two major limitations. First, the study excludes dropouts and absentees, whose behaviour may differ from that of students at school.[17] However, data for those who attend school are important in order to inform school-based intervention efforts. Second, the study relies on self-reported behaviour. Although there is evidence that such data are reliable,[4] this does not ensure validity. However, there are grounds for confidence in this regard: (*i*) confidentiality and anonymity were assured; (*ii*) only 5 students reported use of a fictitious drug (they were excluded from the study); (*iii*) the data were internally consistent, for example, consistent sex differences were present, and the rates of engaging in sexual intercourse increased with age and grade; and (*iv*) there is evidence that such data have a high degree of concurrent criterion validity. For example, significant associations have been documented between self-reported sexual behaviour of Cape Town high-school students and other risk behaviours[15,16] urbanisation status[3] and high school dropout.[17]

Finally, comparison with the 1990 study should be undertaken with caution. Both studies had large samples that aimed to be representative of the population of high-school students in each grade and used the identical questionnaire and study procedure. However, the sampling strategies were different. In the 1990 study, 16 schools were selected using a sampling frame that was stratified by the three education departments operating in Cape Town at the time.[18] Also, the statistical approaches differed. In the 1990 study, although the

appropriate weights were applied to address the stratification criterion of the education departments, sampling weights were not applied to address the number of students in the school, the number of students in the grade (in a specific school) and the number of students sampled from the grade.

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Accepted 14 April 2003.