Knowledge of contraceptive methods among adolescent students

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Abstract

Objective
To compare the knowledge of contraceptive methods as well as to identify factors associated with adequate knowledge among public and private school adolescents.
Methods
A cross-sectional study comprising 1,594 adolescents aged between 12 and 19 years old from 13 public and five private schools in the city of São Paulo city, Brazil, was carried out from June to December 2003. Schools were randomly selected and students filled out a questionnaire about sociodemographic, reproductive and contraceptive methods. The prevalence ratios were estimated with a 95% confidence interval for each question on their knowledge of contraceptive methods and by school group. Each question correctly answered received a half score, and the cut-off value was 50% of correct answers. Statistical tests utilized were Chi-square and Wilcoxon-Gehan tests and Poisson multiple regression model.
Results
Of all respondents, 61% were of females in both school groups. Most students had low socioeconomic condition in public schools while they had mostly high socioeconomic condition in private schools ($p<0.001$). Nearly 18.6% private and 28.6% public school students were sexually active ($p<0.002$). In regard to their knowledge, 25.7% of public and 40.8% of private school students had a score equal to or above five. Factors associated with higher knowledge were: being female, at high school of a private school, having high socioeconomic condition, having had sexual intercourse and being older.
Conclusions
knowledge of contraceptive methods was low in both public and private school students. The study results show that both underprivileged as well as high socioeconomic adolescents need to have adequate information about family planning to improve their knowledge and change their behavior.

INTRODUCTION

Over the last 20 years teenagers have gained access to a wide variety of sources of sexual information and misinformation. In the late eighties, there have been the AIDS emergence and, in the nineties, teenagers have become sexually active at a younger age. Several studies showed that adolescents with low schooling become sexually active at a younger age and that this young population shows inadequate knowledge of contraceptive methods.*,**

Most studies available assessing adolescent's knowledge of contraceptive methods approached this issue in a very subjective manner, without exploring the way these methods were used, their side effects,

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indications and contraindications. Such approach is likely to lead to a flawed understanding of the level of knowledge of this population on birth control[11] and thus result in a biased assessment of the impact of knowledge on the use of contraceptive methods.

In her study, Schor[12] (1995) found inadequate knowledge of contraceptive methods (48.3%) among adolescents aged less than 14 years. According to her, this low knowledge is probably due to the fact that, at this age, female adolescents have not yet become sexually active. However, an increase to 55% was seen at the age of 15 and to 92% at the age of 19, although the quality of the knowledge was not assessed. Few studies[5,10] assessed the level of knowledge on contraceptive methods using a score system. It has been evidenced that, among female adolescents and women of various ages, this knowledge is low or average in about 70% of respondents. However, the use of contraceptive methods has not been directly associated to one's knowledge, suggesting other intervening elements that affect this use such as age at first sexual intercourse, time interval for sexual initiation, access to contraceptive methods, steady sexual partner, partner's objection to the use of contraceptive methods, desire to get pregnant and poor communication between parents and their children concerning sexual issues.[1]

Access to good quality information and the availability of contraceptive choices are crucial to family planning programs targeting not only adolescents but the general population as well. Inadequate knowledge of contraceptive methods can become a resistance factor against their acceptance and use.[5] Likewise, high knowledge levels of contraceptive methods will not bring about any behavior changes unless contraceptive methods are available for adolescents' free choice.

There are scarce Brazilian studies on adolescent students from various socioeconomic backgrounds and most of them included public school students, most likely because private institutions seem more resistant to consenting any research work among their students.[4] As cultural and socioeconomic differences can affect knowledge and use of contraceptive methods,[1] it is thus likely that data from public schools only will not reflect the reality of Brazilian adolescent students.

The present study aimed at comparing knowledge of contraceptive methods between public and private school adolescent students as well as describing factors associated to adequate knowledge of such methods in this population.

METHODS

A cross-sectional Knowledge, Attitude and Practice survey[13] study was carried out in a randomly selected sample comprising public and private middle and high school students from the metropolitan area of the city of São Paulo between June and December 2003.

The sample size was estimated based on a population of 1,362,587 students enrolled from the fifth up to 11th grade, of which 83.1% were from public and 16.9% from private schools.* According to Carlini-Cotrim et al,[4] the proportion of sexually active students in both public and private schools is 33.8% and 28.0% respectively. At 5% type I error and 20% type II error, a sample size of a minimum of 347 students would be required. Hence the estimated prevalence of contraceptive use in the last sexual intercourse was 77% in public and 93.5% in private schools[4] and a sample size of 1,586 students was defined, of which 1,316 from public and 270 from private schools.

It was assumed that the students who would accept to participate in the study 60% would be in public and 40% in private schools, making a total of 13 public and five private schools.

Classes from seventh to 11th grade were drawn. Fifth and sixth grade students were excluded from the study as they aged between 10 and 11 years. Two private schools refused to participate in the study and were replaced by the succeeding schools in the order they were drawn.

After being scheduled, the questionnaires were applied to a classroom, under supervision, during the period of an hour/class time. The data collection instrument was a pre-coded confidential self-administered questionnaire developed by researchers based on a previous model. The study questionnaire was pre-tested in 160 public school students of Campinas, Brazil, and questions were corrected if needed.

The questionnaire comprised five sections with questions on sociodemographic and reproductive characteristics, knowledge of contraceptive methods, knowledge of STI transmission and prevention, use of contraceptive methods and STI prevention. In addition, there were more specific true/false questions addressing information on mode of use, side effects,

*Education Statistics Information System (INEP)/Ministry of Education and Culture. Sinopse Estatística da Educação Básica – Brasil, Regiões e Unidades da Federação. Available from: http://www.inep.gov.br/download/estatisticas/sinopse_estatisticas_2003/censo-miolo1-2003.pdf [2005 nov 24]

advantages and disadvantages of some contraceptive methods as well as STI transmission and prevention.

Datasets were double entered in a database using Epi Info 6.04b software program. Bivariate analysis included students' sociodemographic variables by school group. Statistical analyses were conducted using Pearson's and Yates' Chi-square test and Fischer's exact test when required to replace Yates' test. The variable indicating socioeconomic condition was defined through multivariate cluster analysis.[6] Socioeconomic categories were established based on a questionnaire provided by the Brazilian Advertisers Association (ABA), Brazilian Association of Marketing Research Institutes (Abipeme). Life-table analysis provided cumulative rates of students' first sexual intercourse by age. School groups were compared using Wilcoxon-Gehan test.[8] Bivariate analysis was conducted between the variables knowledge of contraceptive methods and school groups. Association was measured using prevalence ratio (PR) at 95% confidence interval (95% CI).[7] The same analysis was conducted for each correct answer and by school group and their related PR and 95% CI were calculated. Adequate knowledge of contraceptive methods was ascertained when respondents correctly answered at least half of the 20 specific questions, obtaining half score per each correct answer. Those students who correctly scored 10 or more questions (score ≥5) were considered having satisfactory knowledge.

Poisson's regression analysis was carried out between predictive variables (gender, age, religion, schooling, socioeconomic condition, school group, skin color, marital status, employment, sexual intercourse, attendance to religious services) and the variable adequate knowledge of contraceptive methods.[3] SPSS software version 11.5 was used in the bivariate and multivariate cluster analyses. Stata 7.0 software program was used in multiple regression analyses.

The study was approved by the Research Committee of the Department of Obstetrics and Gynecology, Faculdade de Ciências Médicas of the Universidade Estadual de Campinas (FCM/Unicamp) and the FCM/Unicamp Institutional Review Board, as well as authorized by each school's local education office.

RESULTS

A total of 1,594 students aged between 12 and 19 years answered the questionnaire, of these 1,325 from public and 269 from private schools, which met the required sample size.

Most respondents were females (61.2% in public

Table 1 - Percentage distribution of sociodemographic and reproductive characteristics of adolescents, by school group. São Paulo, Brazil, 2003

Variables	School group		p-value
	Private	Public	
Gender			0.996**
Female	61.0	61.2	
Male	39.0	38.8	
(N)	(269)	(1,325)	
Schooling			<0.001***
7th grade	30.9	27.5	
8th grade	18.2	20.5	
9th grade	19.0	22.6	
10th grade	13.0	19.2	
11th grade	19.0	10.1	
(N)	(269)	(1,325)	
Skin color			<0.001**
White	62.8	43.6	
Non-white	37.2	56.4	
(N)	(269)	(1,322)	
Socioeconomic condition			<0.001**
Low	19.4	67.9	
High	80.6	32.1	
(N)	(269)	(1,321)	
Sexual relationship			<0.002**
Yes	18.6	28.6	
No	81.4	71.4	
(N)	(269)	(1,325)	
Cumulative rate of first sexual intercourse			<0.001***
12 years	0.0	2.0	
14 years	2.9	9.7	
16 years	21.6	31.7	
18 years	54.3	53.3	
19 years	77.1	64.4	

*Pearson's Chi-square test
**Yates' Chi-square test
***Wilcoxon-Gehan test (analysis by life-table method)

*INEP/MEC. Sinopse Estatística da Educação Básica (Brasil, Regiões e Unidades da Federação). Available from: http://www.inep.gov.br/download/estatisticas/sinopse_estatisticas_2003/censo-miolo1-2003.pdf. [2005 nov 24]

vs 61.0% in private schools) (p>0.05). As for religion, most students were Catholics (57.3% *vs* 61%), followed by Evangelics (17.2% *vs* 22.8%). Followers of other religions (Buddhism, Judaism and Spiritism) were mainly seen in private schools (p<0.001). Concerning parental schooling, more than 80% of parents had a level of education comparable to or higher than that of nearly 40% of public school parents (p<0.001).

The average age was 15.1±1.5 years in public schools and 14.7±1.6 years in private schools (p<0.002). A significantly higher proportion of private school students aged between 12 and 14 years, were white, had higher socioeconomic condition and were in the 11th grade. In regard to reproductive characteristics, the median age at menarche was about 12.5 years and at first sexual intercourse was around 17.5 years in both school groups. In private schools, there were less sexually active students (p<0.002) and a lower proportion of students who had their first intercourse before the age of 16 (p<0.001) (Table 1).

As for knowledge of contraceptive methods, almost all students in both public and private schools (95%) reported being familiar with one contraceptive method and male condom, the pill and female condom were the most frequently mentioned. However, more students in private than public schools reported being familiar with a greater number of contraceptive methods, a statistically significant difference for all methods except for injectable contraceptives and the calendar method (Table 2).

Table 3 shows the proportion of students who correctly answered each one of the questions on contraceptive methods. Higher scores were seen for the question on female condom in both public and private schools (PR=1.04; 95% CI: 0.99-1.10). Adequate knowledge of male condom was also seen in both public and private school; more than 70% of respondents scored in this question. Between 25% and 57% of the respondents scored in the pill question, with no statistically significant differences between public and private schools. While private school students scored higher on questions on withdrawal (coitus interruptus) and diaphragm, less than half of all students scored in this question.

Private school students had scored higher (about 50%) in questions on IUD and the calendar method. In regard to emergency contraceptive methods, more private school students scored in the question on the mode of use; but this question had low scoring in both school groups (OR=1.43; 95% CI: 1.13-1.82).

Table 2 - Percentage distribution of adolescents according to their knowledge of contraceptive methods, by school group. São Paulo, Brazil, 2003.

Contraceptive method	School group		p-value*
	Private	Public	
Male condom	84.3	74.2	<0.002
Pill	67.8	60.7	0.035
Female condom	52.1	42.2	0.004
Day-after pill	36.0	19.2	<0.001
Diaphragm	18.4	7.0	<0.001
IUD	18.0	6.4	<0.001
Injectable contraceptives	18.0	20.6	0.371
Withdrawal (coitus interruptus)	17.6	7.5	<0.001
Calendar method	16.5	11.9	0.052
Spermicides	11.6	2.2	<0.001
None	2.6	5.3	0.092
(N)	(267)	(1,310)	

*Yates' Chi-square test

Table 3 - Proportion of correct answers on contraceptive methods, by school group (N=1.582)*. São Paulo, Brazil, 2003.

Questions	School group		PR; 95% CI
	Private %	Public** %	
The diaphragm is disposable.	11.6	9.5	1.22; 0.84-1.77
The diaphragm is placed inside the womb.	30.3	11.4	2.66; 2.10-3.37
The diaphragm should be removed 8 to 12 hours after sexual intercourse.	24.3	16.5	1.48; 1.16-1.88
Injectable contraceptives may affect the menstrual cycle.	25.1	16.7	1.51; 1.19-1.92
The day-after pill can be taken up to 72 hours after intercourse.	24.7	17.3	1.43; 1.13-1.82
The diaphragm should only be used with a spermicide cream.	24.0	19.0	1.26; 0.99-1.60
The pill reduces menstrual bleeding.	24.0	19.4	1.24; 0.97-1.57
Injectable contraceptives should be applied every week.	21.3	22.9	0.93; 0.73-1.20
When a whole set of pills is over, a new one should be started on the next day.	26.2	24.4	1.07; 0.86-1.34
Withdrawal can cause headaches in men.	42.3	29.1	1.45; 1.23-1.71
Withdrawal is a safe method of birth control.	47.6	33.8	1.41; 1.22-1.63
The calendar method is very effective for birth control.	50.2	34.1	1.47; 1.28-1.70
Only those with regular cycles can use the calendar method.	52.1	35.3	1.48; 1.29-1.69
The IUD is placed inside the womb.	52.1	39.1	1.33; 1.17-1.52
When women forget to take the pill, they should not take them until the end of the month.	52.8	48.7	1.08; 0.95-1.23
Women should take the pill every day at the same time.	54.3	57.7	0.94; 0.84-1.06
The IUD interferes with sexual intercourse.	56.2	40.2	1.40; 1.24-1.59
Male condom should be taken out when the penis is still erect.	73.8	71.0	1.04; 0.96-1.12
Male condom is good only for birth control.	86.1	76.8	1.12; 1.06-1.19
Female condom should be placed inside the vagina.	88.4	84.6	1.04; 0.99-1.10
Knowledge score ≥5	40.8	25.7	1.59; 1.34-1.88

*12 adolescents did not answer any of true/false questions (2 from private schools and 10 from public schools).
**Reference category for estimating prevalence ratio (PR).

When knowledge score was analyzed, 25.7% of public and 40.8% of private school students showed adequate knowledge of contraceptive methods, a statistically significant difference. Despite low scores, private school students scored higher than public students, above the cutoff value (OR=1.59; 95% CI: 1.34-1.88) (Table 3).

Poisson's regression analysis showed the following factors positively associated to adequate knowledge of contraceptive methods: being female, studying in a private school, having higher schooling and higher socioeconomic condition, being sexually active and older. On the other hand, being Evangelic was negatively associated to adequate knowledge of contraceptive methods, as can be seen in Table 4.

Table 4 - Factors associated with adequate knowledge of contraceptive methods (N=1,340).* São Paulo, Brazil, 2003.

Variable	PR	95% CI
Gender (female)	2.33	1.89-2.87
School group (private)	1.41	1.16-1.72
Schooling (middle school)	1.51	1.17-1.95
Socioeconomic condition (high)	1.32	1.10-1.57
Sexual relationship (yes)	1.32	1.10-1.59
Evangelic religion	0.70	0.54-0.91
Catholic religion	0.84	0.69-1.02
Age (years)	1.10	1.02-1.19

PR: prevalence ratio
Independent variables of the model: gender, age, religion, schooling, socioeconomic condition, school group, skin color, marital status, employment, sexual relationship, attendance to religious services
*254 adolescents did not answer one of the questions including the variables of the model.

DISCUSSION

The present study, by analyzing two randomly selected samples from schools with different characteristics, allowed to comparing the level of knowledge on contraceptive methods of students from different socioeconomic backgrounds.

The study findings showed inadequate knowledge of contraceptive methods by both public and private school students, though the latter showed a slightly broader knowledge.

The study sample is thought to be representative of adolescent school population and allowed comparisons between different groups of students. In spite of that, there were some limitations. One of these limitations was not to include a considerable large share of adolescents who do not attend school and comprises an extremely vulnerable risk group. One should bear that in mind since most studies showed schooling to be strongly associated to greater knowledge and use of contraceptive methods.[1,2]

In addition, there could have been information bias regarding sexual behavior, given that one's sexual life is a private issue and exploring that may be embarrassing and make people wary about the confidentiality of information provided. Some measures were taken to minimize this limitation: confidential questionnaires, voluntary participation, verbal and written assurance of information confidentiality, and questionnaire administration without either teachers or staff being in the classroom.[4] A higher proportion of younger students was seen in private when compared to public schools, which can be explained by the fact that the latter have higher rates of failure and dropouts with students coming back later to attend school at older ages as well as entering school at an older age.[1]

Private school students were generally white adolescents of high socioeconomic condition, which reflects the ethnic and socioeconomic distribution of the Brazilian population, where most non-white people belong to lower social strata.*

It was also verified that most students (81% in private and 71% in public schools) were not yet sexually active, a finding similar to that of Carlini-Cotrim et al[4] about risk behaviors among public and private school students conducted in the metropolitan area of São Paulo. They found that 72% and 66% of private and public school students respectively were not yet sexually active. In the present study, the average age at first intercourse was 17.5 years for both groups. This is comparable to that found in a study[11] where the average age at first sexual intercourse was 16.7 years among males and 19.5 years among females. On the other hand, more recent studies showed adolescents to be on average two years younger at their first intercourse.[1,**] A study carried out** among students from 13 Brazilian capitals found an average age at first sexual intercourse ranging between 13.9 and 14.5 years for male students and 15.2 and 16 years for female students. These conflicting findings could have resulted from underreporting bias by the respondents of the present study. Or else, by differences in the populations studied, since different communities have different characteristics affecting students' knowledge, attitude and sexual behavior.[9]

It was also verified that private school students had had their first intercourse at older ages than public school students. Since 80% of private school students are from high socioeconomic background, socioeconomic condition had likely an impact on their age

*Berquó E. Como, quando e com quem se casam os jovens brasileiros. In: Comissão Nacional de População e Desenvolvimento (CNPD). Jovens acontecendo na trilha das políticas públicas. Brasília (DF): CNPD; 1998. p. 93-108.
**Unesco. Pesquisa: juventudes e sexualidade, 2004. Disponível em URL: http://observatorio.ucb.unesco.org.br/publicacoes/juventudes. [2005 nov 24]

for sexual initiation, as showed by other authors.* Moreover, private school students' higher education could have been a determinant for their sexual behavior. Leite et al[9] (2004) also described that higher schooling could push back the age of sexual initiation and facilitate the use of contraceptive methods in the first sexual intercourse.

The study findings corroborated that students generally report knowledge of several contraceptive methods. The most frequently reported method was male condom followed by the pill, which is in accordance with other recent studies.** The third most frequently reported method was female condom. In the study, knowledge of contraceptive methods was first evaluated through questions on which methods students knew how to use it. Knowledge of sterilization was not explored as this is not an appropriate contraceptive method for adolescent population. The greater interest verified on female condom could be because it is a contraceptive method that protects against sexually transmitted diseases and empowers women on fertility issues as well.[1]

In regard to knowledge scores, it should be highlighted the questions on contraceptive methods addressed to the students were quite uncomplicated and required a minimum knowledge to be answered. Also, not all contraceptive methods available were explored and some were intentionally less explored than others, consistent with their relevance to the age group studied. Knowledge scores can thus be seen only as an indicator of inadequate knowledge; it might be their level of knowledge is even lower than that evidenced in the study.

While higher scores were found among private school students, both public and private groups showed to have inadequate knowledge of contraceptive methods. In a study on both female and male public school students in Bahia, Almeida et al[1] (2003) verified that only 50% had a level of knowledge deemed as high. Inadequate knowledge could explain the different choices of contraceptive methods among adolescents, basically limited to male condoms and the pill. Without adequate knowledge of contraceptive methods, myths, such as IUD interferes with sexual intercourse or withdrawal is an effective birth control method, are perpetuated. The lack of knowledge on contraceptive alternatives becomes a resistance factor against contraceptive use.[5]

The study findings evidenced an association of inadequate knowledge with socioeconomic variables. This suggests that better off young people have access to better quality information, though this is not always sufficient. Gender issues and becoming sexually active had an impact on their knowledge, probably reflecting the established notion that contraception is women's responsibility only. Sexual initiation, especially at older ages, stimulates students to actively seek out for more information on contraceptive methods.

These findings underline the need for promoting general education among adolescents in general, not only poor young people. And most important, they stress the need for promoting this population's social development, by capacitating them to fight for their rights and have access to relevant information on contraception among them.

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