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Teenage pregnancy and frequent use of alcohol and drugs in the home environment

ABSTRACT

OBJECTIVE: To assess individual and family factors associated to teenage pregnancy, including frequent use of alcohol and illicit drugs by family members.

METHODS: Case-control study conducted with a sample of 408 sexually active female adolescents (aged 13-17 years) in school from the city of Marília (Southeastern Brazil) in 2003-2004. Cases consisted of 100 primigravid teenagers assisted in prenatal care programs in health units. Controls were 308 nulligravid students from state public schools. Standardized instruments identified demographic and educational factors, contraceptive behavior, mental health problems, and family characteristics. Statistical analysis included chi-square tests and logistic regression models.

RESULTS: Low paternal education (p=0.01), lack of information on sexuality and fertilization (p=0.001) and the use of illicit drugs by a resident family member (p=0.006) were independent risk factors. Family income per capita and asking the partner to use a condom were confounders.

CONCLUSIONS: The frequent use of illicit drugs by a resident family member is a factor strongly associated to teenage pregnancy, regardless of other risk factors. The expectation of going to college constitutes a protective factor, mainly in the presence of low maternal education.

DESCRIPTORS: Pregnancy in Adolescence. Family Relations. Risk Factors. Alcohol Drinking. Street Drugs. Case-Control Studies.

INTRODUCTION

The world teenage population has grown above one billion, and 60 out of every 1000 girls aged 10 to 19 become mothers. This corresponds to the birth of 17 million babies per year.[a] In Brazil, the female population between 10 and 19 years of age is already above 17 million (IBGE).[b] Prevalence of teenage pregnancy has been estimated in 8.9% among men and of 16.6% among women[2] in home surveys carried out in capitals of three Brazilian states (Salvador, Rio de Janeiro and Porto Alegre).

The low schooling rate of teenage mothers is one of the main consequences of pregnancy in this age group. This leads to conditions, which hamper their ability to overcome poverty, such as lower qualification and less chances of competing in the labor market, thus leading to informal and underpaid work.[b]

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[a] World Health Organization. Child and adolescent health and development [acesso em 7 out 2006]. Disponível em: http://www.who.int/child-adolescent-health

[b] Instituto Brasileiro de Geografia e Estatística. Censo demográfico 2000 [acesso em 16 ago 2006]. Disponível em: http://www.ibge.gov.br/home/estatistica/populacao/censo2000/default.shtm

Although in many cases the teenager has already left school before becoming pregnant, it is common that they drop out school during pregnancy. Often, teenage mothers do not return to school.[15]

A cross-sectional study carried out in Rio de Janeiro[18] showed that teenagers who mentioned a negative reaction on the part of their family felt less valued, with very few expectations concerning the future and showed greater psychological suffering when compared to those who found support in their family. Besides that, teenagers who did not attend school before becoming pregnant also presented low self-esteem and little expectation concerning their future, when compared to teenagers who left school during pregnancy.[18] Making inadequate use of prenatal care is also one of the characteristics of teenage pregnancy[1,5] that negatively influences the biological outcomes of the pregnancy.

In regard to preventive actions, it is essential to have knowledge of the factors that favor teenage pregnancy. Among the main already established factors, we can highlight variables related to demographics, education, sexual and contraceptive behavior, and psychosocial factors concerning the teenager and her family. The literature shows associated factors such as: adverse socioeconomic situation,[5,6] becoming sexually active early in life,[8,10,16] higher frequency of sexual intercourse,[11,20,21] lack of use or inconsistent use of contraceptive methods,[11,20] lower expectations on the part of the teenager concerning schooling and professional performance in the future,[9,10] among others. In regard to family functioning and structure, studies have shown significant associations between teenage pregnancy and low schooling of the father and/or mother, early pregnancy of the teenager's biological mother, dysfunctional family relationships, such as early death of the mother, and absence of a father figure.[4,9,12,13,20]

Although the relation between the use of drugs by teenagers and teenage pregnancy has been studied, the association between the use of drugs by a family member and teenage pregnancy has not been investigated.

The present study aimed at analyzing individual and family factors associated to teenage pregnancy, including the frequent use of alcohol and illicit drugs by the teenagers' family members.

METHODS

A case-control study was carried out in the urban area of the city of Marília, Southeastern Brazil, between February/2003 and October/2004.

Two groups of female teenager students aged 13-17 years were compared.

The cases consisted of 100 primigravid teenagers, at any stage of pregnancy, assisted at community health units and family health units in the entire urban area of Marília identified through prenatal service registries. Teenagers were recruited consecutively during 12 months at each one of the units. Teenagers who went to the private health system for prenatal care and those who suffered miscarriages were excluded. Data was collected through individual interviews at the units where the teenagers received prenatal care.

The decision of including a higher number of controls to maximize the power of the study was based on a recommendation by Schlesselman (1982).[19] The control group included 308 sexually active teenage girls, who had no prior pregnancy history, and studied in eight out of the 12 eligible state schools in the urban area. Students from these 12 schools are representative of all the female teenager population in the public school system in Marília. Schools were considered eligible when having students in the eighth to eleventh grade, and were located near the health units. One of the schools refused to participate and three schools were not approached. We randomly selected 70% of classes in each grade to take part in the study. Cases and controls were not matched.

Sexually active teenagers who had never been pregnant were identified in educational activities addressing teenage pregnancy that took place at the schools and involved teenagers from both genders. The activities were coordinated by a psychologist.

After watching a video addressing teenage pregnancy, followed by an open discussion on the topic, the participants filled in a questionnaire, which addressed risk factors (current, past 12 months, lifetime). The variables surveyed included sociodemographic data, characteristics of the home environment, school performance, expectations concerning education, and sexual and contraceptive behavior. Teenage mental-health problems were assessed based on the Brazilian version of the *Youth Self Report* (YSR).[a]

The YSR (2001 version) provides the behavior profile of adolescents based on 118 items which enable the identification of eight syndromes (subscales): anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behavior, and aggressive behavior. The YSR classifies the sample in three categories: clinical, borderline and non-clinical, according to cut-off points for scales' T-scores. The tool reveals whether teenagers present deviant behavior in relation to what is expected of their age and gender. The cut-off point corresponded to the clinical category, both for scales of "internalization", and for scales of "externalization" (score T≥64). Borderline cases were considered nonclinical.

[a] Abreu SR, Bordin IAS, Paula CS. *Youth Self Report* – Versão brasileira. São Paulo: Escola Paulista de Medicina/Unifesp. Versão original de Achenbach T, University of Vermont Copyright 2001. Disponível em: www.ASEBA.org

The SPSS program, version 10.0, was used for statistical analysis. In univariate analysis, chi-square tests were applied to identify odds ratios (OR) and 95% confidence intervals.

Multiple logistic regression analysis identified independent risk factors and confounders. The initial model included risk factors of interest (also examined in univariate analysis), per capita family income and the interaction between maternal education and the expectation of the teenager to attend college. The remaining interactions tested were not included in the initial model due to p>0.10. The explanatory variables included in the initial model did not present collinearity.

The study was approved by the Ethics in Research Committee at Universidade Federal de São Paulo (Project # 0841/03) and at the Faculdade de Medicina de Marília (Project #173/01), the Marília Municipal Secretariat for Health and Hygiene, and the Marília Region Education Board. All teenagers signed an informed consent statement and so did their parents or other adults responsible (teachers, coordinators/ school principals, health professionals from the health units).

RESULTS

Table 1 shows the main sociodemographic characteristics for cases and controls. The age median in both groups was 16 years and the family income median was R$122.50 and R$200.00 per month(p<0.001) for pregnant and non-pregnant teenagers respectively.

The mean age at first sexual intercourse was similar for cases and controls (14.7 *vs* 14.8 years).

Concerning univariate analysis, 11 out of the 16 potential risk factors examined (seven family characteristics and nine individual factors) were associated with teenage pregnancy (p<0.05), as shown in Tables 2 and 3. Among pregnant teenagers who occasionally used preservatives, 18.3% justified this behavior by expressing their desire to become pregnant.

The initial logistic regression model included the 16 risk factors of interest to this study, family income per capita, and interaction between maternal education and the teenager's expectations concerning going to university. The final model (Table 4) identified independent risk factors (p<0,05): low paternal education, lack of information on sexuality and fertilization, and frequent use of illicit drugs by a resident family member. Rarely using preservatives, not having been raised by her mother, mother being pregnant in adolescence, and an interaction between maternal education and the teenager's expectation of attending college reached a marginal level of significance (p≤0,07). Income per capita and asking her partner to use preservatives were identified as confounders, since removing these variables would affect, in more than 15%, the coefficient (β) of the variable "mother being pregnant in adolescence", thus causing that variable to loose significance.

Table 1. Sociodemographic characteristics of in-school teenagers: pregnant (N=100) and non pregnant (N=308). Marília, Southeastern Brazil, 2003-2004.

Sociodemographic characteristic	Pregnant		Non pregnant		p
	N	%	N	%	
Age (years)					
13	1	1.0	0	0.0	0.10
14	5	5.0	35	11.4	
15	25	25.0	75	24.4	
16	41	41.0	103	33.4	
17	28	28.0	95	30.8	
Education					
8th grade	22	22.0	59	19.2	0.30
9th grade	24	24.0	97	31.5	
10th grade	36	36.0	88	28.6	
11th grade*	17	17.0	64	20.8	
Missing	1	1.0	0	0.0	
Family income per capita (minimum wage**)					
Less than 1	77	77.0	156	50.6	<0.001
1-2	12	12.0	78	25.3	
Over 2	1	1.0	19	6.2	
Missing	10	10.0	55	17.9	
Marital status					
Lives with boyfriend/husband	39	39.0	16	5.2	<0.001
Does not live with boyfriend/husband	61	61.0	289	93.8	
Missing	0	0.0	2	0.6	

* Last high-school grade in Brazil
** Minimum wage = R$240.00 (2003)

The interaction between maternal education and the teenager's expectation of attending college, showed that the odds ratios of these two variables were mutually conditioned. When maternal education was equal or above grade eight, the teenager's expectations concerning her own education did not interfere in the risk of the teenager becoming pregnant (p>0,05). However, in the group of teenagers whose mothers had not completed grade eight, the risk of becoming pregnant was three times greater for those teenagers who did not intend to go to university (Table 5). In the multivariate analysis the 4.7 odds ratio shows the effect of the interaction adjusted for all the explanatory variables contained in the final model (Table 4).

Table 2. Family characteristics of pregnant (N=100) and non pregnant (N=308) in-school teenagers. Marília, Southeastern Brazil, 2003-2004.

Family characteristic	Pregnant		Non pregnant		OR*	p
	N	%	N	%		
Raised by biological mother**						
No	5	5.0	18	5.8	0.9 (0.3;2.3)	0.745
Yes	95	95.0	289	93.8		
Raised by biological father**						
No	40	40.0	84	27.3	1.8 (1.1;2.8)	0.017
Yes	60	60.0	223	72.4		
Maternal education***,****						
Never attended school or did not complete 8th grade	74	74.0	158	51.3	2.9 (1.7;4.9)	<0.001
Completed 8th grade or above	24	24.0	147	47.7		
Paternal education*****,*******						
Never attended school or did not complete 8th grade	72	72.0	153	49.7	4.5 (2.5;8.3)	<0.001
Completed 8th grade or above	15	15.0	145	47.1		
Age of biological mother at first pregnancy*******,********						
≤ 17 years	39	39.0	89	28.9	1.7 (1.01;2.7)	0.033
18 years or above	56	56.0	214	69.5		
Drunkeness of a family member in the last 12 months**,*******						
Yes, more than once a week	17	17.0	26	8.4	2.2 (1.1;4.3)	0.014
No or once a week	82	82.0	281	91.2		
Drug use (except tobacco) by a family member, in the last 12 months*******,********						
Yes, more than once a week	14	14.0	8	2.6	6.1 (2.5;15.0)	<0.001
No or once a week	85	85.0	298	96.1		

* Missing not included
** 1 control missing
*** 2 cases missing
**** 3 controls missing
***** 13 cases missing
****** 10 controls missing
******* 1 case missing
******** 4 controls missing

The study presented statistical power (P) <80% for only four variables: (1) drunkenness of a residing family member more than once a week (P=78.5%); (2) teenager not raised by her biological mother (P=76.7%); (3) drug use (except tobacco) by a residing family member more than once a week (P=70.2%); and (4) not receiving information on sex and fertilization (P=53.2%).

DISCUSSION

Evidence obtained in the present study may help in the development of teenage pregnancy prevention programs. The sample, including 100 cases and three times the controls, enabled the study to have a statistical power greater than 80% to identify risk factors with frequency higher than 16.9% among controls, when $p<0.05$ and $OR\geq2$.[19] Excluding pregnant teenagers who were not attending school, prevented that risk factors for school drop-out were confounded with risk factors for teenage pregnancy. However, this exclusion criterion does not enable generalizations concerning the teenage population outside the educational system. Another limitation of this study is due to the possibility of the teenagers in the control group having been untruthful, both concerning prior pregnancies – mainly in the case involving abortions – and concerning the use of drugs by residing family members. Despite the fact that we did not actively search for this information, we understand that self-reports and anonymous questionnaires minimized this possibility.

In the present study, the father's low education, lack of information on sexuality and fertilization, and the frequent use of illicit drugs by a residing family member have been associated to teenage pregnancy.

The association between low paternal education and teenage pregnancy was only found in a small number of studies.[8,9] In Ecuador, while comparing pregnant

Table 3. Association of individual characteristics of pregnant (N=100) and non pregnant (N=308) in-school teenagers. Marília, Southeastern Brazil, 2003-2004.

Individual characteristic	Pregnant		Non pregnant		OR*	p
	N	%	N	%		
Work and education						
Working for pay in the last 12 months**						
No	55	55.0	173	56.5	0.9 (0.6;1.5)	0.788
Yes	45	45.0	133	43.5		
Grade retention at school***						
Yes	35	35.0	52	16.9	2.6 (1.6;4.4)	<0.001
No	65	65.0	255	82.8		
Intends to go to university****						
No	56	56.0	67	21.8	4.5 (2.8;7.3)	<0.001
Yes	44	44.0	239	77.6		
Sexual and contraceptive behavior						
Age of first sexual intercourse***						
< 15 years	39	39.0	119	38.7	1.01 (0.6;1.6)	0.966
15 years or above	61	61.0	188	61.0		
Received information on sexuality and fertilization*****						
No	16	16.0	3	1.0	19.4(5.5; 68.0)	<0.001
Yes	84	84.0	305	99.0		
Used preservatives in the last 12 months******						
No/sometimes	71	71.0	133	43.1	3.1 (1.9;5.1)	<0.001
Always	29	29.0	172	55.9		
Used to ask her partner to use preservatives**, ****						
No	43	43.0	69	22.4	2.6 (1.6;4.3)	<0.001
Yes	56	56.0	237	77.0		
Mental health problems						
Internalizing behaviors						
Clinical	36	36.0	88	28.6	1.4 (0.8;2.2)	0.161
Non clinical	64	64.0	220	71.4		
Externalizing behaviors						
Clinical	12	12.0	64	20.8	0.5 (0.2;1.0)	0.050
Non clinical	88	88.0	244	79.2		

* Missing not included
** 1 case missing
*** 1 control missing
**** 2 controls missing
***** Lifetime
****** 3 controls missing

teenagers to 88 non pregnant teenagers, Guijarro et al[9] (1999) found that 67.5% and 15.0%, respectively, were fathered by men who had only completed elementary school (p=0.002). However, these data should be examined with caution, as the study was carried out with a convenience sample and does not clarify whether the pregnant subjects were primigravid teenagers or whether non pregnant subjects were sexually active with no prior pregnancy history. In Brazil, low paternal education has also been identified as a risk in a retrospective cohort study carried out in Pelotas, Southern Brazil.[8] In this study, including 828 19-year-old female teenagers, 420 of which already have children (cases) and 408 which had never given birth (controls), based on the city's registry for living newborns. The authors verified that 42% of cases and 20.5% of controls were fathered by men with less than five years of schooling (OR=2.2; 95%: CI 1.1;4.6; p=0.03). However, there was no information whether the controls have prior pregnancy history.

Table 4. Risk factors for teenage pregnancy in a sample of pregnant (N=100) and non pregnant (N=308) in-school teenagers according to the final model of logistic regression. Marília, Southeastern Brazil, 2003-2004.

Risk factor	OR	p
Sexual and contraceptive behavior		
Received information on sexuality and fertilization*	20.2 (3.6;113.1)	0.001
Used preservatives in the last 12 months*	1.9 (0.9;3.8)	0.073
Used to ask her partner to use preservatives*	1.7 (0.8;3.5)	0.118
Work and Education		
Expects to go to university*	0.9 (0.2;3.8)	0.948
Family characteristics		
Family income per capita	1.7 (0.8;3.8)	0.164
Raised by her biological mother*	0.08 (0.005;1.3)	0.074
Age of biological mother at first pregnancy**	1.9;(0.9;3.7)	0.073
Maternal education***	0.8 (0.3;2.0)	0.690
Paternal education***	2.9 (1.3;6.5)	0.010
Residing family member used illicit drugs****	6.3 (1.7;23.7)	0.006
Interaction between maternal education and university expectation	4.7 (1.0;23.1)	0.054

* No vs yes
** ≤17 years old vs 18 years old or above
*** completed 8th grade: No vs Yes
**** Yes vs No

Table 5. Interaction: odds ratio (OR) of maternal education* according to teenager university expectation categories and OR of teenager university expectation** according to maternal education categories. Marília, Southeastern Brazil, 2003-2004.

Interaction	OR
Maternal education	
Teenager does not intend to go to university	0.83
Teenager intends to go to university	3.9
Teenager university expectation	
Mother did not complete 8th grade	0.96
Mother completed 8th grade or above	3.0

* < 8 years of schooling vs. ≥ 8 years of schooling
** Does not intend to go to university vs. intends to go to university

Among teenagers, unplanned pregnancy is influenced by lack of information on sexuality and fertilization and inadequate use of their knowledge on contraception.[a] Not knowing the woman's fertile period and inadequate use of contraceptive methods were present among women using prenatal care services at a university hospital in Campinas, Southeastern Brazil.[3] In a study of the characteristics of sexual life and contraceptive knowledge, attitude and practice, Belo et al (2004)[3] assessed 156 pregnant females, representing 59% of new cases of teenage pregnancy in ten consecutive months. Only 11.5% of the pregnant teenagers were able to accurately identify the time of the month they were fertile. In addition, logistic regression analysis showed that the higher the socioeconomic status and the older the teenager, the more adequate was their knowledge on contraceptive methods. The authors[3] concluded that despite significant advances, the information available to teenagers in Brazil is apparently insufficient to promote a change of attitude concerning the efficient and preventive use of contraceptives. In the present study, pregnant teenagers were more uninformed about sexuality and fertilization and showed a tendency of not using preservatives when compared to non pregnant teenagers.

There is a consensus in the literature that unprotected sexual intercourse is one of the main risk factors of unplanned pregnancies.[11,20] A study carried out in the United States[11] a convenience sample of 128 teenagers at school, 69 of which were pregnant and attended a school for pregnant teenagers, and 59 were not pregnant and did not have children and came from a school attended by most of the pregnant teenagers before becoming pregnant. Pregnant teenagers differed from non pregnant teenagers in that they had higher frequency of sexual intercourse and lower frequency of use of contraceptives. In Brazil, a study carried out in Montes Claros, Southeastern Brazil,[b] compared two independent samples of teenagers, 196 of which were primigravid teenagers and 183 were students, who were sexually active and have never been pregnant. Multiple logistic regression analysis identified as an independent risk factor the fact that the teenager had never used contraceptive methods (OR=2.1; 95% CI: 1.1;4.0; p=0.02).

We did not find in the literature studies concerning the use of illicit drugs by a residing family member as a potential risk factor for teenage pregnancy. However, factors such as father's use of alcohol and difficulties in family interaction are more frequently studied and certainly associated to pregnancy.[4,9,14] A study carried out in Chile[14] comparing pregnant (N=160) and non pregnant teenagers (N=60) assisted at a public hospital, concluded that the parents of pregnant teenagers drank more, had more problems with the justice system and presented higher levels of family dysfunction. Therefore, one can assume that this behavioral pattern can also be found among illicit drug users.

[a] World Health Organization. Child and adolescent health and development [acesso em 7 out 2006]. Disponível em: http://www.who.int/child-adolescent-health
[b] Maia EMGC. Características psicossociais da gravidez na adolescência na cidade de Montes Claros- MG [Dissertação de mestrado]. São Paulo: Universidade Federal de São Paulo; 2003.

The harmful use and/or addiction to alcohol and drugs in the home environment operate as a permanent stress factor that can produce significant psychosocial consequences for the user's family. In these families physical aggression, death of family members and problems with the police are more frequent.[7] Another study was carried out in Bolivia[13] with a population sample of 190 teenagers: 95 that were or had been pregnant in the last 12 months and 95 that had no prior pregnancy history. Logistic regression analysis showed that fights between parents were more common in the pregnant teenagers' group (OR=2.5; IC 95%: 1.1-5.3; p<0.05). In addition, in teenager focus groups, teenagers were asked to whom they resorted for information and support concerning sexuality, contraception and pregnancy, and most of them mentioned friends and health services instead of parents.

Having a mother who became pregnant for the first time in adolescence is one of the most known risk factors for early pregnancy.[8,12,17] A case-control study carried out in Taiwan[13] compared 198 teenage mothers to 198 teenagers with no prior pregnancy history, matched by age and place of residency (controls and cases were neighbors). Logistic regression analysis showed that it was more frequent among cases to have mothers who first became pregnant during adolescence (OR=4.9; 95% CI: 2.2;11.0). Gigante et al (2004)[8] also found this difference in a cohort study carried out in Pelotas, where the probability of becoming pregnant was 1.7 times greater among teenagers who had mothers who became pregnant at 20 or under (p=0.05). Also, in Portugal, a study performed by Pereira (2005)[17] with low-income 14 to 18-year-old girls, compared 57 primigravid teenagers to 81 teenagers who had never been pregnant. It was observed that having a mother who became pregnant in adolescence was one of the five risk factors that better explained teenage pregnancy (OR=8.1; IC 95%: 1.1-57.8; p=0.04). In the present study, the pregnancy of the mother in adolescence was a risk factor that reached a marginal level of significance (p=0.07), just as the variable of not being raised by the biological mother (p=0.07). We believe it is reasonable to assume that the fact of the teenager not having been raised by her biological mother is an indirect sign of family problems, such as teenage mothers who left home, leaving their babies with the grandmother, separation of the couple resulting in child abandonment by the mother, or even death. However, these aspects were not explored in the present study.

Concerning the teenagers' long term educational expectations, a case-control study in Ecuador[9] verified that non pregnant teenagers more likely intended to attend university, presenting higher expectations than pregnant teenagers (p<0.001). In the present study, higher educational expectations has proven to be an important protective factor against teenage pregnancy, mainly among teenagers whose mothers had not completed grade eight.

As a conclusion, the use of illicit drugs by a residing family member constitutes a factor associated to teenage pregnancy, regardless of the influence of other relevant factors, such as the age of first pregnancy of the teenager's mother, inadequate use of contraceptive methods and low parental education. On the other hand, in a scenario of low family income and low parental education, the desire to attend university operates as a protection against pregnancy before 18 years of age among public school female students.

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