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Unplanned Pregnancy in Adolescents: Association with Family Structure, Employed Mother, and Female Friends with Health-Risk Habits and Behaviors

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ABSTRACT *Previous publications have suggested that living in a nonintact family household and socializing with girlfriends who smoke or who consume alcoholic beverages favor the development of health-risk habits and customs in adolescents. However, their relationship with unplanned pregnancy in adolescents has not been determined. We investigated the association between family structure, employed mother, and female friends with health-risk habits and behaviors with unplanned pregnancy in adolescents (n=3,130). After adjusting for low maternal educational level and low family income, logistic regression analyses showed that having an employed mother and socializing with girlfriends who have health-risk habits or behaviors, rather than living in a nonintact family household, appear to be the most important health-risk factors for unplanned pregnancy in adolescents. It is important for health-care programs for adolescents to be revised and for their strategies be strengthened in order to reach the objectives for which they were created.*

KEYWORDS *Family, Adolescent, Unplanned pregnancy, Risk factors*

INTRODUCTION

Unplanned pregnancy in adolescents constitutes an important health problem worldwide and has been associated with a great number of negative health outcomes.[1–3] According to recent publications, the prevalence of unplanned pregnancy in adolescents worldwide ranges from 33 to 82 %.[4–6] In Mexico, according to some researches, prevalence reached up to 44.7 %.[1,7] The negative effects that the unplanned pregnancy generate include the following: an increase in maternal–infantile morbidity and mortality, loss of self-esteem, depression, anxiety, familial conflicts, dropping out of school, interruption of life project, premature incorporation into the labor force, and maintenance of the poverty cycle.[1,8,9]

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The study of the etiology of unplanned pregnancy has allowed identifying some risk factors, among which single marital status, low family income, household crowding, smoking, neighborhood violence, and religion are highlighted.[10,11] However, to our knowledge, the relationship between family structure, employed mother, and the presence of female friends with health-risk behaviors with unplanned pregnancy in adolescents has not been studied worldwide.

Previous publications show that living in a nonintact family household,[12] having a mother who works outside of the home,[13,14] and socializing with friends who smoke or consume alcoholic beverages favor the development of health-risk habits and customs in adolescents.[15] It is clear that the temporary or permanent absence of one or both of the biological parents in the adolescent's home and socializing with friends with health-risk behaviors can favor the acquisition of certain habits or behaviors that are risky for health, including engaging in sexual practice at an early age and the development of an unplanned pregnancy.[16] One priority for reducing the indexes of unplanned pregnancy in adolescents is to identify, but above all understand, the degree to which some familial and social circumstances exert an influence on the development of this enormous health problem. Accordingly, this study was designed to determine the association between family structure, employed mother, and the presence of girlfriends with health-risk habits and behaviors with the development of unplanned pregnancy in adolescents.

METHODS

Study Design, Participants, and Setting

This is a cross-sectional study based on a population research. A total of 3,500 female adolescents aged 13–19 years who had participated in a broader, prior longitudinal study initiated in June 2010, with the primary objective of detecting and preventing health-risk habits and behaviors, were invited to participate. Of these, 370 adolescents were not included in the final sample due to their not completing the questionnaire or to their reporting incorrect information that impeded its analysis; thus, we analyzed data on 3,130 adolescents. The response level was 89.42 %. The sample corresponds to approximately 35 % of the total population of female adolescents who reside in our region. Data were analyzed in 2013.

The female adolescents included in the study are residents of an urban area of northeastern Mexico. This zone is localized in the southern part of the state of Tamaulipas, on the Gulf of Mexico coast and 542 km northwest of the Mexican capital, and is composed of the cities of Tampico, Ciudad Madero, and Altamira. The three cities share an area of 1,492.7 km^2 and have a population of 706,771 inhabitants.

The study was approved by the Ethics Committee of the Faculty of Medicine of Tampico, Autonomous University of Tamaulipas.

Procedure

For information gathering, we constructed a self-administered questionnaire. Questionnaire completion was carried out with specially trained personnel. Training of personnel was conducted through presentations and workshops with the objective of unifying criteria with regard to certain questionnaire items, including those related with the diagnosis of health-risk habits and behaviors such as unplanned pregnancy. Completion of the questionnaire was performed in the adolescents' homes, recreational

areas, public sites, schools, and institutions providing health services, especially those of the Mexican Ministry of Health.

For completion of the instrument, we requested permission from the educative authorities of the zone. Thus, we had reliable information with respect to number and localization of the zone's school inspections, amount and site of secondary and preparatory schools supervised by each inspection, number of school sessions, and the groups and amount of students registered in each group. The schools and students participating in the study were selected by a simple random sampling technique. In each of the schools selected, we requested a list with the names of all registered students, with which we again carried out a selection of students by the randomized number system.

At the health centers, which are dependent on the health ministry of the state of Tamaulipas, permission was requested from the authorities to apply the questionnaires to adolescents who presented for an appointment at adolescent health-care modules. We requested and obtained oral and written informed consent from all of the adolescents or from their parents or guardians. Adolescents had the right to withdraw from the study at any moment, even after they finished responding to the questionnaire.

Information Gathering

We constructed a self-administered questionnaire based on others previously utilized.[17,18] To determine the level of understanding of questionnaire items, we conducted two pilot studies performed with a 15-day difference between them. In the questionnaire, we included general questions concerning life habits and sociodemographic data. Questions were closed, multiple choice, and binomial, grouped in four blocks.

In the first block, we included questions to document the age of the adolescents, anthropometric measurements, civil status, if they had children, schooling, history on health-risk habits and behaviors such as active smoking, consumption of alcoholic beverages, and sexual activity. Similarly, we documented the adolescents' sexual education level and communication with their parents on sexuality themes. Additionally, information was collected on the health-risk habits and behaviors of the girlfriends with whom the study participants socialized most frequently.

In the second block of the questionnaire, we gathered family information, such as the civil status of the parents, whether the adolescent lived with one or both biological parents, familial socioeconomic level, etc.

In the third and fourth blocks of questions, we requested information on the mother and father, respectively, on age, occupation, schooling, the practice of sports, smoking, alcoholism, level of knowledge of the Internet and time spent online during the day, etc.

Measurements of Interest and Coding of Variables

Unplanned Pregnancy Information related to this dependent variable was collected by means of two questions:[17] First, the adolescent was asked whether she was pregnant at present or was pregnant during the previous 12 months. For analysis in this study, this group of adolescents was identified as follows: 1—pregnant and 0—not pregnant.

Subsequently, in the case of having a child (of either gender) or of being pregnant at present, the adolescent was asked: Prior to the pregnancy, did you want a son or

daughter? This nominal variable was codified as 1=unplanned pregnancy if the adolescent's response was "No" and 0=planned pregnancy if the adolescent's response was "Yes."

Family Structure The response to the question on the relationship that the adolescents had with the persons living in their homes was employed to determine family structure. Response options were the following: (1) biological father and mother, (2) biological father and stepmother, (3) biological mother and stepfather, (4) only one biological parent, (5) a biological parent and other relatives, and (6) no biological parent. Based on the presence or absence of both biological parents, this variable was coded as follows: 1= nonintact family if the adolescent lived with one or with no biological parent or 0=intact family if the adolescent lived with both biological parents.

Mother Employed Outside the Home The presence of an employed mother was documented when the adolescents responded that their biological mother had worked outside the home during the 12 months prior to the study. For the analyses, this variable was coded as 1—employed mother or 0—no employed mother.

Girlfriends with Health-Risk Behaviors The presence of girlfriends with health-risk behaviors was documented when the adolescents responded affirmatively that some or all of their best girlfriends had one or all three of the following habits or health-risk behaviors: smoking, consumption of alcoholic beverages, and/or having sexual relations at an early age. For analysis, this variable was coded as 1—girlfriends with health-risk behaviors or 0—girlfriends without health-risk behaviors.

Girlfriends Who Smoke With respect to the association with girlfriends who smoke, the information was obtained through the response to the question "How many of your best girlfriends smoke?" The options were (a) none of them smoke, (b) some of them smoke, (c) the majority of them smoke, and (d) all of them smoke. We consider the presence of smoking friends when the adolescents responded affirmatively that some or the majority of best girlfriends smoke. This variable was dichotomized as 1=girlfriends who smoke and 0=girlfriends who do not smoke.

Girlfriends Who Consume Alcoholic Beverages Information in reference to the presence of girlfriends who consume alcoholic beverages was obtained by means of the response to the question "How many of your best girlfriends consume alcoholic beverages?" The options were (a) none of them, (b) some of them, (c) the majority of them, and (d) all of them. We consider the participants as having girlfriends who consume alcoholic beverages when the participants responded that some or the majority of their best girlfriends consumed alcoholic beverages. This variable was dichotomized as 1=girlfriends who consume alcoholic beverages and 0=girlfriends who do not consume alcoholic beverages.

Girlfriends with Early Sexual Activity This variable was documented when the study participants affirmed that all or some of their best girlfriends had sexual relations without being married. For the analysis, this variable was coded as 1—girlfriends with sexual activity and 0—girlfriends without sexual activity.

Active Smoking Measurement of this variable was obtained from participant response to the following: (a) Do you smoke? Options for responding were (1) yes, at least one

cigarette daily; (2) yes, but less than one cigarette a week; (3) yes, at least one cigarette per month; (4) yes, but only on special occasions; and (5) no, I do not smoke.

We considered these adolescents as active smokers when they reported themselves to be smokers at the time of the interview. This dependent variable was coded as 1 = smoker and 0 = nonsmoker.

Statistical Analysis

The prevalence of nonintact family, employed mother, and girlfriends with health-risk habits and behaviors were determined to compare adolescents with and without unplanned pregnancy. Logistic regression models were performed to study the association between nonintact family, employed mother, and girlfriends with health-risk habits and behaviors with the outcome variable (unplanned pregnancy). Adjusted odds ratios (OR) and their 95 % confidence intervals (CI) were calculated. In evaluating the association, we adjusted for the following confounders: low maternal educational level and low family income. Data were analyzed by means of SPSS ver. 10.0 statistical package software. Any value of $p<0.05$ was considered significant.

RESULTS

Sociodemographic Data of the Total Population

Mean age of the total participating adolescent population was 16.37 ± 1.93 years. Of the total sample, 785 adolescents were pregnant. A group of 2,345 adolescents were identified with no history of pregnancy at any time in their lives. They served as controls for detecting differences (Table 1) in adolescents with planned, unplanned pregnancy, and nonpregnancy.

TABLE 1 Percentages of age, family structure, employed mother, active smoking, and girlfriends with health-risk behaviors in adolescents with pregnancy, unplanned pregnancy, and without pregnancy (*n* = 3,130 adolescents)

	Pregnancy (*n* = 785)							
	Planned (*n* = 318)		Unplanned (*n* = 467)		No pregnancy (*n* = 2,345)		Total (*n* = 3,130)	
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Age (years)								
<15	13	(4.1)	25	(5.4)	641	(27.3)	679	(21.7)
>15	305	(95.9)	442	(94.6)	1,704	(72.7)	2,451	(78.3)
Intact family	159	(50.0)	310	(66.4)	1,594	(68.0)	−2,063	(65.9)
Nonintact family	159	(50.0)	157	(33.6)	751	(32.0)	1,067	(34.1)
Employed mother	132	(41.5)	255	(54.6)	1,079	(46.0)	1,466	(46.8)
Active smoking	39	(12.3)	99	(21.2)	367	(15.7)	505	(16.1)
Girlfriends with health-risk behaviors	304	(95.6)	459	(98.3)	2,066	(88.1)	2,829	(90.4)
Girlfriends who smoke	236	(74.2)	375	(80.3)	1,440	(61.4)	2,051	(65.5)
Girlfriends who consume alcoholic beverages	270	(84.9)	423	(90.6)	1,927	(82.2)	2,620	(83.7)
Girlfriends with sexual activity	273	(85.8)	421	(90.1)	1,495	(63.8)	2,189	(69.9)

[a]The results are expressed as number (percent)

In the group of pregnant adolescents, the mean age was 17.29 ± 1.48 years. A nonintact family was reported by 40.3 % of adolescents, and 49.3 % reported having an employed mother. The prevalence of active smoking was 17.6 %, and the presence of girlfriends with some health-risk behaviors was 97.2 %. The prevalence of unplanned pregnancy registered in this study was 59.5 %. Table 1 shows the percentages of age, family structure, an employed mother, active smoking, consumption of alcoholic beverages, presence of girlfriends with health-risk behaviors, girlfriends who smoke, girlfriends who consume alcoholic beverages, or girlfriends who have sexual relations at an early age in adolescents with planned and unplanned pregnancy and in adolescents without pregnancy. According to the analysis, the percentages of employed mother (54.6 vs. 46.0 %), active smoking (21.2 vs. 15.7 %), and girlfriends with health-risk behaviors (98.3 vs. 88.1 %) were higher in adolescents with unplanned pregnancy than in adolescents without pregnancy.

A higher percentage of adolescents with unplanned pregnancy (Table 2) was found in youngsters with employed mother (65.9 vs. 53.3 %), who are active smokers (71.7 vs. 56.9 %), and who had girlfriends with some health-risk behaviors (60.2 vs. 36.4 %), such as being an active smoker (61.4 vs. 52.9 %), consuming alcoholic beverages (61.0 vs. 47.8 %), or having sexual relations at an early age (60.7 vs. 50.5 %), compared with adolescents with planned pregnancy.

Univariate analysis showed a significant association between having an employed mother (crude OR = 1.69; 95 % CI = 1.27–2.26), being an active smoker (crude OR = 1.92; 95 % CI = 1.28–2.87), and socializing with girlfriends with some health-risk habits or behaviors (crude OR = 2.64; 95 % CI = 1.09–6.37) with unplanned pregnancy.

TABLE 2 Association between familial structure, employed mother, girlfriends with some health-risk habits or behaviors and the development of unplanned pregnancy in adolescents

	Unplanned pregnancy in adolescents (n = 467)			
	Yes/no	%	OR adjusted to p value (95 % CI)[a]	Crude OR, p value (95 % CI)[a]
Nonintact family[b]	157/159	49.7	0.52 (0.39–0.71)*	0.50 (0.37–0.67)*
Intact family	310/159	66.1		
Employed mother[b]	255/132	65.9	1.76 (1.27–2.43)*	1.69 (1.27–2.26)*
No employed mother	212/186	53.3		
Active smoking[b]	99/39	71.7	1.70 (1.03–2.79)*	1.92 (1.28–2.87)*
No smoking[b]	368/279	56.9		
Girlfriends with some health-risk habits[b]	459/304	60.2	2.84 (1.14–7.08)*	2.64 (1.09–6.37)*
Girlfriends without health-risk habits	8/14	36.4		
Girlfriends who smoke[b]	375/236	61.4	0.81 (0.52–1.26)**	1.41 (1.00–1.98)*
Girlfriends who do not smoke	92/82	52.9		
Girlfriends who consume alcoholic beverages[b]	423/270	61.0	1.71 (1.09–2.66)*	1.70 (1.10–2.64)*
Girlfriends who do not consume alcoholic beverages	44/48	47.8		
Girlfriends with sexual activity[b]	421/273	60.7	1.63 (1.02–2.61)*	1.50 (0.97–2.33)**
Girlfriends without sexual activity	46/45	50.5		

CI confidence interval, *OR* odds ratio

*p<0.05; **p>0.05

[a]Adjusted for low maternal educational level and low family income variables

[b]Reference category

Results of the logistic regression models show that after controlling for low maternal educational level and low family income, having an employed mother (adjusted OR = 1.76; 95 % CI = 1.27–2.43), being an active smoker (adjusted OR = 1.70; 95 % CI = 1.03–2.79), and having girlfriends with some health-risk behaviors (adjusted OR = 2.84; 95 % CI = 1.14–7.08) remained significantly associated with unplanned pregnancy in adolescents.

DISCUSSION

Our results show that having an employed mother, being an active smoker, and the presence of girlfriends with some health-risk behaviors appear to be associated with unplanned pregnancy in adolescents.

Previous investigations showed that the acquisition and development of some health-risk behaviors or habits in adolescents can be fostered by the presence of a mother who works outside the home.[13,14,19] To our knowledge, this is the first work that explores the relationship between having an employed mother and unplanned pregnancy in a restrictive sample of adolescents. According to the analyses in this study, adolescents who have an employed mother have a 1.76 times greater risk of developing an unplanned pregnancy in comparison with adolescents with a mother who does not work outside the home. This is important to bear in mind because, in Mexico, as well as in developed and in developing countries, the prevalence of mothers who work outside the home has increased over the past decades.[20,21] It is noteworthy that the presence of a mother who works outside the home can contribute to a better family economic level. However, the time that the mother spends at work outside of the home does not always translate into the well-being of her children, because the mother may not be able to supervise her children's activities, inside as well as outside the home. In some developed countries, this observation has given rise to strong debate on the theme of whether both parents should work outside the home when the children are minors, this due to the negative impact generated on the children's development when both parents work outside the home.[21]

Smoking

The association between smoking and the development of unwanted pregnancy in adolescents has been previously reported by other authors.[10,12,22] Macedo et al. found that adolescents who smoke have a 1.08 times greater risk of having an unplanned pregnancy in comparison with adolescent girls who do not smoke. The results of our study show that adolescents who smoke have a 1.70 times greater risk of developing an unplanned pregnancy in comparison with those who do not smoke. Some of the following factors can favor this association: The high prevalence of smoking in the adult population, particularly when it is the parents who smoke, can be perceived by female adolescents as that the habit is not harmful to health, which leads to other health-risk behaviors in those who smoke. In addition, smoking is a habit that precedes experimentation with other drugs and one that has been associated with sexual relations at an early age and, consequently, unplanned pregnancy.[10,15,22] It is important for smoking prevention programs to be revised and their strategies strengthened to reach the objectives for which they were designed.

Presence of Girlfriends with Health-Risk Behaviors

Diverse research works have been consistent in showing that socializing with friends who smoke and who consume alcoholic beverages constitutes an important risk factor for developing some health-risk behaviors, such as the use of illegal substances in

adolescents.[15,23] However, to our knowledge, the relationship between socializing with girlfriends who have some health-risk habits such as smoking, consuming alcoholic beverages, and early sexual activity, and unplanned pregnancy in adolescents has not been previously documented. According to our results, adolescents who socialize with girlfriends who consume alcoholic beverages have a 1.71 times greater risk of having an unplanned pregnancy in comparison with having girlfriends who do not consume alcoholic beverages. Likewise, adolescents who have girlfriends with early sexual activity have a 1.63 times greater risk for developing an unplanned pregnancy in comparison with those with girlfriends without early sexual activity. It is possible that some of the following factors favor this association. Adolescence is a life stage during which important changes take place in development, including organic, psychological, and adapting to society. It is evident that it is difficult for many young people to adapt themselves to and integrate themselves into a changing society and one full of social norms. During adolescence, young people are also subjected to many pressures by their friends to acquire habits that are harmful to health with the threat of being or not being admitted into a determined group of friends. Additionally, in this life period, female adolescents are more willing to explore and experiment, and on many occasions, they do not consider that decision making and the health-risk habits developed during this stage will exert an influence, whether positive or negative, on the rest of their lives.

Family Structure

According to recent reports, the number of single-parent families has increased in the last years.[24,25] Previous researches have reported that living in a household with one, or no, biological parent has been associated with the development of health-risk habits and behaviors including unplanned pregnancy in adolescents.[14,26,27] The determinants proposed for explaining the relationship between the single-parent family and unplanned pregnancy in adolescents are the following: lack of supervision of the activities of adolescents and a more tolerant attitude toward risky habits or behaviors by the permanent biological parent. To all of these, we must add that at this age, adolescents spend more time with their friends than with their families, and the opinion of friends regarding the acquisition of certain health-risk habits and behaviors can be more influential than that of their parents.[28–30] According to the analysis in this study, we did not find living in the household of a nonintact family to be associated with the development of an unplanned pregnancy, on determining that the greatest percentage of unplanned pregnancy (66.1 vs. 49.7 %) is found among adolescents who live in households with both biological parents. Even more so, the statistical significance found in the logistic regression analysis appears to show that living in a nonintact family household comprises a protector factor against unplanned pregnancy in adolescents. It is possible that in our study, monitoring of the activities of the adolescents by the permanent biological parent was more effective, that there is better communication and respect between the permanent biological father or mother and the daughter, or even that the rules established in the home concerning health-risk habits and behaviors were complied with by the adolescents.

This study possesses the following methodological limitations that should be taken into consideration on generalizing its results: (a) unplanned pregnancy diagnosis was performed through a self-administered questionnaire utilizing a sole question; past publications have shown that the use of these questions can be effective for the diagnosis of unplanned pregnancy.[17,18] (b) Detection of smoking and consuming alcoholic beverages were carried out through self-administered questionnaires: no objective tests

to diagnose smoking or drinking, such as pulmonary function tests, carbon dioxide measurements, or blood alcohol level, were conducted. However, past investigations have shown that the use of self-reported questionnaires can be considered effective for measuring the diagnosis of smoking and drinking in epidemiological studies. (c) We were unable to compare the difference in the magnitude of the association between having girlfriends with one, two, or more health-risk behaviors and unplanned pregnancy, on not identifying the different bases in prior reports concerning this relationship. (d) The greatest risk for unplanned pregnancy identified with the variable "girlfriends with health-risk behaviors," in comparison with that obtained in the analysis of each health-risk behavior individually (smoking, consuming alcoholic beverages, or sexual activity), is not due to the sum of all of these health-risk behaviors identified in the friends of the adolescents, but to the fact that this variable is found to be included in all adolescents who have girlfriends with one, two, and three health-risk behaviors. (e) This is a cross-sectional study; thus, no causal relationship can be established.

In conclusion, having an employed mother, being an active smoker, and the presence of girlfriends with some health-risk behavior are associated with unplanned pregnancy in adolescents. It is important for health-care programs for adolescents to be revised and for their strategies be strengthened in order to reach the objectives for which they were created.

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