Published in final edited form as:

J Adolesc Health. 2010 December 1; 47(6): 600–603. doi:10.1016/j.jadohealth.2010.03.018.

Associations between Multiple Pregnancies and Health Risk Behaviors among US Adolescents

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Abstract

PURPOSE—This study examined the associations between health risk behaviors (i.e., substance use behaviors, physical violence, or carried a weapon) and multiple adolescent pregnancies (i.e., experiencing or causing more than one pregnancy).

METHODS—We analyzed 1999–2003 data (three years: 1999, 2001, and 2003) from the National Youth Risk Behavior Survey (YRBS), a nationally representative survey of high school students (N = 14,211 participants). Multinomial logistic regression was used to compare one and multiple pregnancies versus no pregnancies. Logistic regression was used to compare multiple pregnancies versus one pregnancy.

RESULTS—A dose-response relationship was observed between multiple adolescent pregnancies and health risk behaviors; the more risk behaviors endorsed the greater likelihood of experiencing/causing multiple adolescent pregnancies. Participants who engaged in a “high” degree of risk behaviors were significantly more likely to have experienced/caused multiple adolescent pregnancies than no pregnancies (or only one pregnancy) versus youth who endorsed no risk behaviors. Earlier sexual debut and more lifetime sexual partners were also associated with increased risk of endorsing multiple adolescent pregnancies.

CONCLUSIONS—The health risk behaviors examined in our study can provide warning signs to influential persons who can potentially deliver important prevention messages to at-risk adolescents.

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All remaining authors do not have a financial interest/arrangement or affiliation with any organizations that could be perceived as real or apparent conflict of interest in the context of the subject of this article.

Introduction

Multiple pregnancies (i.e., experiencing or causing more than one pregnancy) during adolescence are a recognized risk for females who have had one adolescent pregnancy [1,2]. In contrast, risk factors for adolescent males who cause multiple pregnancies remain overlooked and understudied. Risky sexual behaviors and behaviors like smoking, substance use, and physical violence are associated with first adolescent pregnancy [2,3]. However, our understanding about these risk behaviors and associations with multiple adolescent pregnancies is limited. Pregnancy, especially when experienced or caused multiple times, threatens adolescents' current and future health and well being. Thus, an improved understanding of its co-occurrence with other health risk behaviors is important for understanding adolescents' exposure to health risks.

Materials and Methods

Data Source

The present study utilizes 1999-2003 data (three years: 1999, 2001, and 2003) from the National Youth Risk Behavior Survey (YRBS), a biennial survey established by the Centers for Disease Control and Prevention to measure health-risk behaviors [4]. For each survey period, the YRBS utilizes a three-stage cluster sampling design to produce a representative sample of high school students (9th-12th grade) attending public, Catholic, and other private schools in the United States. Additional details on YRBS sampling procedures are available elsewhere [5]. Questions about adolescent pregnancy were not asked after 2003.

Variables of Interest

The outcome of interest was assessed by the question "How many times have you been pregnant or gotten someone pregnant?" Responses were never, one time, two or more times, not sure; participants who responded "not sure" and those not yet sexually active were excluded from analyses.

Health risk behaviors were assessed with the Recent Risk Scale, a scale created by Santelli et al. [6] to measure whether the respondent ever, in the last 30 days: carried a weapon, smoked cigarettes, smoked two or more cigarettes every day, drove after drinking, rode with a driver who had been drinking, drank alcohol, drank five or more alcoholic beverages in one sitting (binge drinking), used marijuana, used cocaine or was involved in a physical fight in the last 12 months. Participants were categorized into one of four groups based on their responses to each item which included none (0 of the 10 items), low (one to two items), medium (three to six items), and high (seven to 10 items).

Statistical Analyses

Multinomial logistic regression was used to compare one and multiple pregnancies versus no pregnancies. Logistic regression was used to compare multiple pregnancies versus one pregnancy. SAS-callable SUDAAN version 9.0.1 was used [7]. Analyses took into account all stages of clustering (year, stratum, and primary sampling unit) and sample weights. Independent variables were forced into the model. Final models controlled for age, race/ethnicity, age of first sexual intercourse, number of sexual partners, and survey year.

Results

Table 1 describes our sample. Only participants who had engaged in sexual intercourse were considered for analyses (weighted n=18,839, 43% of the full sample; 47% had not engaged in sex and 10% did not answer this item). Participants who were "unsure" if they had ever

experienced/caused a pregnancy were excluded (weighted $n = 477$). Caucasians, African Americans, and Hispanics were included in the analyses; other racial/ethnic groups were excluded due to small sample size ($n=1,738$). Ungraded participants (weighted $n=22$) or those with missing data (weighted $n=2,391$) were excluded; participants with missing data were more likely to be non-Caucasian, male, and younger (all $p<.001$). Our analyses included 14,211 participants.

Most participants (90%, weighted $n = 12,778$) had never experienced or caused a pregnancy. Eight percent of participants had experienced or caused a pregnancy one time (weighted $n = 1,183$) and 2% of participants had experienced or caused a pregnancy two or more times (weighted $n = 250$). More females than males reported one pregnancy while more males had an earlier sexual debut, endorsed a “high” degree of risk behaviors, and had five or more lifetime sexual partners (all $p<.001$).

As seen in Table 2, a dose-response relationship was observed between multiple adolescent pregnancies and health risk behaviors; the more risk behaviors endorsed the greater likelihood of experiencing/causing multiple adolescent pregnancies. Participants who engaged in a “high” degree of risk behaviors were significantly more likely to have experienced/caused multiple adolescent pregnancies than no pregnancies (or only one pregnancy) versus youth who endorsed no risk behaviors. Earlier sexual debut and more lifetime sexual partners were also associated with increased risk of endorsing multiple adolescent pregnancies.

Discussion

We found a dose-response relationship between an increased likelihood of multiple adolescent pregnancies and severity of risk behaviors. Whether multiple adolescent pregnancies are an outcome of “proneness to problem behavior” or a precursor, it appears to be part of a broad profile of health behaviors that cross multiple domains of risk (i.e., sexual and nonsexual behaviors) [8]. While the majority of risk behaviors examined in the present study were assessed in the last 30 days, this *snapshot* is likely a reflection of recurring patterns of behaviors. In addition, the stepwise pattern of the associations we found support that it is worthwhile to consider multiple adolescent pregnancies within the context of the more general spectrum of risk behaviors that occur during this important transition period in development.

YRBS is cross-sectional and causation cannot be determined. YRBS omits potential explanatory variables and is a self-report, school-based survey which excluded high school dropouts for whom adolescent pregnancy rates may be higher. Therefore, rates of multiple adolescent pregnancies may be underestimated. The pooled data is dated (i.e., from 1999-2003) but provided the best opportunity for statistical precision than current, smaller datasets. Despite these limitations, the derived implications are significant. Pregnancy prevention efforts should be comprehensive in their efforts to target adolescents at risk for multiple pregnancies. Efforts to reduce health risk behaviors, in general, may provide an added benefit to males since they were nearly twice as likely as females to endorse a “high” degree of risk behaviors. Moreover, the health risk behaviors examined in our study can provide warning signs to influential persons who can potentially deliver important prevention messages to at-risk adolescents.

Acknowledgments

This publication was made possible by funding from the KL2 RR024994 – ICTS Multidisciplinary Clinical Research Career Development Program and Grant Number UL1 RR024992 from the National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH) and NIH Roadmap for Medical

Research. Its contents are solely the responsibility of the authors and do not necessarily represent the official view of NCCRR or NIH. This publication was also supported in part by an NIH Career Development Award awarded to Dr. Cavazos-Rehg (NIDA, K01DA025733). This publication was also supported in part by an NIH Midcareer Investigator Award awarded to Dr. Bierut (K02 DA021237). This publication was also made possible in part by NIDA grant 5 T32 DA07313-09 (Drug Abuse Comorbidity, Prevention & Biostatistics) awarded to Dr. Cottler.

Dr. Bierut is listed as an inventor on a patent (US 20070258898) held by Perlegen Sciences, Inc., covering the use of certain SNPs in determining the diagnosis, prognosis, and treatment of addiction. Dr. Bierut has acted as a consultant for Pfizer, Inc. in 2008.

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Table 1

Descriptive characteristics, 9-12th graders, 1999-2003 YRBS (N=14,211) ^a

Variable	Weighted:	Males (weighted n=6,965)		Females (weighted n=7,246)	
		%	95% CI	%	95% CI
Race					
Caucasian		65.0	61.1-68.6	66.9	63.2-70.5
African American		19.4	16.6-22.5	18.9	15.9-22.4
Hispanic		15.7	13.4-18.2	14.1	11.9-16.7
Age of participant, mean		16.4	16.3-16.4	16.4	16.3-16.4
Experienced or caused a pregnancy					
never		92.5	91.1-93.7	87.5	85.9-88.9
one time		5.8	4.9-6.9 ^c	10.8	9.5-12.1 ^c
two or more times		1.8	1.3-2.4	1.8	1.3-2.3
Recent risk behaviors scale ^b					
none		12.6	11.5-13.7	17.0	15.6-18.4
low (1-2 behaviors)		23.2	21.5-25.0	28.2	26.8-29.6
medium (3-6 behaviors)		46.1	43.9-48.2	44.6	43.0-46.3
high (7-10 behaviors)		18.2	16.5-20.0 ^c	10.2	9.2-11.4 ^c
Age of sexual debut, mean		14.2	14.1-14.3 ^c	14.6	14.6-14.7 ^c
Number of sexual partners					
1		36.3	33.9-38.8	41.0	39.4-42.8
2-4		39.4	37.8-41.0	39.9	38.3-41.5
5+		24.3	21.9-26.8 ^c	19.1	17.3-21.0 ^c

^a Abbreviations: CI, confidence interval^b Risk behaviors include if participant ever, in the last 30 days carried a weapon, smoked cigarettes, smoked two or more cigarettes every day, drove after drinking, rode with a driver who had been drinking, drank alcohol, drank five or more alcoholic beverages in one sitting (binge drinking), used cocaine, or used marijuana. Also includes whether the respondent was involved in a physical fight in the last 12 months.^c Significantly different comparisons between males and females, $p < .001$

Table 2

Multivariable model examining associations predicting becoming pregnant or getting someone pregnant during adolescence ^a

Variable	1 vs. 0 pregnancies ^b OR 95% CI	≥ 2 vs. 0 pregnancies ^b OR 95% CI	≥ 2 vs. 1 pregnancy ^c OR 95% CI
Race			
Caucasian	1.0 referent	1.0 referent	1.0 referent
African American	2.0 1.6-2.5	2.8 1.6-5.0	1.3 0.8-2.0
Hispanic	1.7 1.4-2.0	2.0 1.3-3.2	1.3 0.8-2.1
Age (years)	1.4 1.3-1.5	1.4 1.1-1.7	1.1 0.9-1.4
Gender			
Male	1.0 referent	1.0 referent	1.0 referent
Female	2.7 2.1-3.6	2.4 1.7-3.3	0.9 0.6-1.5
Recent risk behaviors scale ^d			
none	1.0 referent	1.0 referent	1.0 referent
low (1-2 behaviors)	1.3 0.9-1.7	2.8 1.3-6.0	2.2 1.1-4.3
medium (3-6 behaviors)	1.1 0.7-1.7	2.5 1.3-4.6	1.7 0.9-3.2
high (7-10 behaviors)	1.9 1.3-2.8	8.1 3.9-16.6	3.4 1.6-6.9
Age at first sexual intercourse	0.8 0.7-0.9	0.6 0.5-0.7	0.8 0.7-0.9
Number of sexual partners			
1	1.0 referent	1.0 referent	1.0 referent
2-4	1.7 1.3-2.3	1.4 0.7-2.8	0.9 0.5-1.9
5+	2.9 2.1-4.0	5.2 2.6-10.2	2.0 1.0-4.1
Survey year	0.8 0.7-0.9	0.9 0.7-1.2	1.1 0.9-1.5

* Weighted sample size of each group is: 0 pregnancies: n = 12,778; 1 pregnancy: n = 1,183; ≥ 2 pregnancies n = 250

^a Abbreviations: CI, confidence interval; OR, odds ratio

^b Multinomial regression

^c Logistic regression

^d Risk behaviors include if participant ever, in the last 30 days carried a weapon, smoked cigarettes, smoked two or more cigarettes every day, drove after drinking, rode with a driver who had been drinking, drank alcohol, drank five or more alcoholic beverages in one sitting (binge drinking), used cocaine, or used marijuana. Also includes whether the respondent was involved in a physical fight in the last 12 months.