Drug Use Risk Behavior Co-Occurrence Among United States High School Students

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Abstract:

Purpose: Prevalence estimates for drug use health risk behaviors among high school students are widely available, but relatively few studies describe how and to what extent these risk behaviors occur together. Furthermore, little research has examined whether the co-occurrence of health risk behaviors varies by key demographic characteristics such as gender and race/ethnicity. The purpose of this study is to develop prevalence estimates for combinations of co-occurring drug use health risk behaviors among United States high school students, and to investigate demographic differences in co-occurrence. Methods: Survey data from a representative sample of United States high school students (N = 16,410) were analyzed. This research is on four health risk behaviors: tobacco use, alcohol use, marijuana use, and cocaine use. Explicit descriptions of the risk behavior combinations that students engage in are presented, and comparisons are made among gender, grade, and racial/ethnic student groups using chi-squared tests. Results and Conclusions: Study results suggest that most adolescents do not engage in multiple risk behaviors simultaneously and that race, gender, and grade level significantly impact the prevalence of co-occurring risk behaviors.

Keywords: adolescent behavior | health behavior | risk behavior | school health

Article:

INTRODUCTION

For several decades, the literature on adolescents has shown concern about health risk behaviors in which youths engage. Tobacco, drug, and alcohol use, lack of physical activity, sexual risk taking, and behaviors that put students at risk for injuries have been identified by the U.S. Centers for Disease Control and Prevention (CDC) as priority areas for surveillance and intervention for adolescents because these behaviors represent significant preventable causes of morbidity and mortality (Eaton et al., 2010). In addition to compromising the current health

status of young people, risk behaviors initiated during adolescence result in adverse health consequences in adulthood with significant social and financial costs (Hoffman, 2006).

There are many sources of population-level data on adolescent risk behavior in the United States, including the National Longitudinal Survey of Youth, the National Longitudinal Study of Adolescent Health, and the Youth Risk Behavior Survey. There is also an extensive literature on prevalence estimates for health risk behaviors among adolescents. One line of research has examined whether risky behaviors exist in a "constellation." Notable research by Jessor and Jessor used Problem Behavior Theory to suggest a risk behavior syndrome that includes cigarette smoking, alcohol and other drug use, risky sexual behavior, and delinquency (Jessor & Jessor, 1977). This paradigm has been used to understand youth behaviors and to conceptualize potential interventions to reduce morbidity and mortality. For example, Eaton and colleagues found that among high school boys and girls, as the number of risk behaviors increased, likelihood of being the victim of dating violence also increased (Eaton et al., 2007). Similarly, work of Everett and colleagues (2004) and of Baskin-Sommers and Sommers (2006) showed that substance use among youths co-occurs with drinking and driving, other injury risk behaviors, and unsafe sexual behavior. The approaches used to date have not been without critique, however. As Hair and colleagues (2009) note,

> Many studies support [the concept of] a single 'syndrome' or factor underlying risky behaviors, such as a disposition toward deviance and unconventionality or a health-compromising lifestyle. However, other evidence suggests that there are multiple causes of adolescent risky behavior, with causes varying by situation and behavior. (p. 254)

With few exceptions (Brener & Collins, 1998; Lindberg, Boggess, & Williams, 2000), little research to date has examined how multiple risk behaviors vary across population groups (e.g., by gender, grade level, or race/ethnicity).

Co-occurrence of health risk behaviors is when an individual engages in multiple health risk behaviors within a given time interval. When an individual engages in multiple risk behaviors but not all within the specified interval, those behaviors are not all co-occurring (though a subset of the risk behaviors may be). For example, a student reporting having used tobacco *and* alcohol in the 30 days prior to the survey would be said to have a co-occurrence of the two risk behaviors. The proportion of students who engage in any possible combination of co-occurring risk behaviors can be estimated as easily as are single risk behaviors.

In the current study, recent data is analyzed from the United States 2009 YRBS, a nationally representative sample of high school students, focusing on four health risk behaviors that represent important preventable causes of morbidity, mortality, and/or negative social consequences: tobacco use, alcohol use, marijuana use, and cocaine use. The goal of the present study is to provide estimates of the proportion of students engaging in specific co-occurring risk behavior combinations. In addition, demographic characteristics associated with significant

differences in the distribution of health risks will be identified while controlling for covariates. This study is important because it applies a methodology for understanding adolescent risk behavior and presents results relevant to policymakers, evaluators, parents, and other stakeholders who seek to understand and improve the health of young people.

METHOD

Data for this present study comes from the 2009 United States high school YRBS which is part of the U.S. Centers for Disease Control and Prevention's national Youth Risk Behavior Surveillance System (YRBSS). The YRBS is conducted every odd-numbered year in order to monitor health risk behaviors that pose the greatest threat to the health and safety of adolescents and young adults. In each survey round, the YRBS contains approximately 100 items that measure these behaviors. Demographic characteristics such as grade level, race, and gender were also measured by the YRBS.

The sample design is a two-stage cluster sample with schools selected at the first stage with probability proportional to size and classes selected at the second stage with all students in a selected class eligible to participate. Completed survey responses are weighted to adjust for non-response and oversampling. In 2009, responses were collected from a representative sample of 16,410 United States high school students. The school response rate was 81% and the student response rate was 88%, yielding an overall response rate of 71%. More information about the YRBS items and methodology is available from the CDC (2009). Youth participation in the YRBS is voluntary and all data are anonymous; any potential identifying information has been removed from the publicly available data sets.

For this study, four questions were selected which measure current risk behavior across several risk domains. Respondents were asked whether or not they (1) smoked cigarettes on 1 or more of the past 30 days; (2) had at least 1 drink of alcohol on 1 or more of the past 30 days; (3) used marijuana 1 or more times during the past 30 days; and (4) used any form of cocaine during the past 30 days.

RESULTS

Sample Characteristics and Marginal Risk Percentages

The demographic characteristics of the sample as well as estimates of the percentage of students engaging in one of the four selected risk behaviors are presented in Table 1. Estimates are shown by grade level, gender, and race/ethnicity.

TABLE 1. Distribution of Demographic Characteristics and Select Health Risk Behaviors, United States High School YRBS, 2009

	Total Sample		Percentage Reporting Health Risk Behaviors			
Demographic	%	N	Tobacco	Alcohol	Marijuana	Cocaine

			Use	Use	Use	Use
Gender						
Female	47.8	8,280	19.1	42.9	17.9	2.0
Male	52.2	8,065	19.8	40.8	23.4	3.5
Grade						
9th	28.0	4,153	13.5	31.5	15.5	2.3
10th	26.2	3,926	18.3	40.6	21.1	2.5
11th	23.6	4,092	22.3	45.7	23.2	3.3
12th	22.2	4,137	25.2	51.7	24.6	3.0
Race/Ethnicity						
Non-Hispanic Black	14.4	2,832	9.5	33.4	22.2	1.9
Non-Hispanic White	58.7	6,889	22.5	44.7	20.7	2.4
Hispanic/Latino	18.6	4,759	18.0	42.9	21.6	4.3
Other	8.4	1,629	16.5	32.6	17.0	3.7
Total		16,410	19.8	41.8	20.8	2.8

Note. All variables are self-reported by respondents and refer to the 30 days prior to the survey. Percentages are weighted to account for the complex sampling design of the survey.

Table 2 lists the proportion of students who engage in each of the 16 possible combinations of co-occurring risk behaviors.

TABLE 2. Percentage Co-Occurrence of Selected Risk Behaviors, United States High School YRBS, 2009

Risk Combination	**None**	**T**	**A**	**M**	**C**	**TA**	**TM**	**TC**	**AM**	**AC**	**MC**	**TAM**	**TAC**	**TMC**	**AMC**	**TAMC**
Gender																
Female	53.9	3.0	19.5	2.1	<0.1	5.5	1.3	<0.1	5.5	0.2	0.1	7.4	0.1	0.1	0.2	1.1
Male	53.9	2.1	15.6	3.9	0.2	4.7	1.9	0.1	6.8	0.1	0.2	7.7	0.3	0.2	0.4	1.8
Grade																
9th	64.7	1.7	14.4	3.1	0.1	3.3	1.7	0.1	4.1	0.2	0.1	4.8	0.2	<0.1	0.3	1.2
10th	55.5	2.1	16.8	3.2	0.1	4.3	1.5	0.1	6.2	0.1	0.1	8.0	0.3	0.2	0.3	1.3

11th	49.1	3.1	18.8	2.9	0.2	5.4	2.0	0.2	6.7	0.1	0.1	8.7	0.1	0.3	0.3	1.7
12th	43.3	3.4	20.5	2.9	0.1	8.1	1.4	<0.1	8.3	0.1	0.3	9.2	0.1	0.3	0.2	1.8
Race/Ethnicity																
Non-Hispanic Black	60.1	1.3	14.4	7.6	0.3	1.9	1.1	0.2	8.0	0.1	0.1	3.8	0.2	0.2	0.3	0.5
Non-Hispanic White	51.2	3.0	18.6	1.8	0.1	6.4	1.7	<0.1	6.0	0.1	0.1	9.0	0.1	0.2	0.2	1.5
Hispanic/Latino	53.6	2.3	18.2	3.5	0.1	3.7	1.7	0.1	6.2	0.4	0.3	6.8	0.4	0.1	0.5	2.1
Other	63.0	2.1	13.0	2.7	0.2	4.4	1.5	0.1	4.6	0.1	0.2	5.7	0.5	0.1	0.2	1.6
Total	53.9	2.5	17.4	3.0	0.1	5.1	1.7	0.1	6.2	0.1	0.1	7.5	0.2	0.2	0.3	1.5

Note. None = no risk behaviors, T = tobacco use, A = alcohol use, M = marijuana use, C = cocaine use.

Patterns of co-occurring risk behavior differ by race, gender, and grade. Results suggest that proportions associated with specific risk behavior combinations differ by gender

($\chi^2_{df=15} = 118.86$; *pval* < 0.0001), grade ($\chi^2_{df=15} = 377.7$; *pval* < 0.0001), and race

($\chi^2_{df=15} = 443.95$; *pval* < 0.0001).

DISCUSSION

Data from the 2009 United States high school YRBS were examined in order to provide prevalence estimates of co-occurring health risk behaviors in the student population. A majority of students engage in one or zero risk behaviors at once and a relatively small minority of students engage in more than two of the selected risk behaviors at once.

The results of the current study should be interpreted with consideration to a number of study limitations. The data analyzed were from a national cross-sectional survey of high school

students, and all behaviors were self-reported. Research does indicate that information on risk behaviors may be gathered as reliably from adolescents as from adults. Internal reliability checks were used to identify inconsistent responses or false answers. Furthermore, results are only generalizable to adolescents attending high school; youths who do not attend school are not represented. It is likely that engaging in risk behaviors is more common among the population of out-of-school youths than in the student population. Another limitation of the study is that "co-occurrence" is defined in such a way that the behaviors may not occur simultaneously but rather may be separated by significant time intervals. Despite these limitations, this study provides important insights into adolescent risk behavior among high school students, as well as the conceptualization of risk behavior for professionals working to improve the health and well-being of youths.

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Notes

Note. All variables are self-reported by respondents and refer to the 30 days prior to the survey. Percentages are weighted to account for the complex sampling design of the survey.

Note. None = no risk behaviors, T = tobacco use, A = alcohol use, M = marijuana use, C = cocaine use.

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