Original Article

Perceived Risk of Weekly Marijuana Use Among Students Participating in the National Survey on Drug Use and Health

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Abstract

This study sought to assess the relationship of risk perception of weekly marijuana use and the influence of parental, peer, and school factors as predictors among U.S. adolescents. Data for this study was derived from the 2020 National Survey on Drug Use and Health. Students who reported strong parental involvement/support, peer disapproval of marijuana use, low perception of peer use, and enjoyed school were more likely to report that using marijuana weekly was a risk behavior. Students who reported no lifetime alcohol or illicit drug use were more likely to view weekly marijuana use as a risk behavior. Differences were also observed for sex of respondent. This study further adds evidence of the influence of parental, peer, and school factors as effective strategies to control adolescent marijuana use. There is a need for multidimensional programs that target adolescents' perceptions of risk of marijuana use, as well as targeting significant others.

Keywords

risk perception, marijuana, adolescents, parental involvement, peer influence

Introduction

Substance use among adolescents in the United States is at an alarming rate. According to the Youth Risk Behavior Survey (YRBS), 24.1%, 14.8%, 14.3% of adolescents in the US have tried cigarettes, illicit drugs, and non-medical prescription drugs with 29.2% being current alcohol users. This same study found that 36.8% of adolescents have tried marijuana and 21.7% are current marijuana users (CDC, 2019a). Marijuana is the most widely used illegal drug among US adolescents and has been shown to cause negative effects both mentally and physically (CDC, 2019b; Hammond, Chaney, Hendrickson, 2020).

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Research on marijuana use and brain health has shown that marijuana use alters brain development and functioning and is associated with impaired memory, decision-making, and learning (Cyrus et al., 2021; Hall and Degenhardt, 2009; Lubman et al., 2015; Takagi et al., 2011). This impairment in cognitive functioning may result in poorer academic success. For example, one study found that regular marijuana use was associated with a lower grade point average and lower aptitude test scores across four years of high school (Meier et al., 2015). Silins et al., (2014) found that regular marijuana users were significantly less likely to complete high school and obtain a college degree compared to those students who never used marijuana. Another study found that adolescents who used marijuana on a regular basis lost an average of 5.8 IQ points by adulthood (Meier et al., 2012). Other studies have found similar results in that adolescents who reported marijuana use were more likely to have lower grades, lower scores on measures of academic functioning, and more likely to fail out of school (Patte et al., 2017; Enrenreich et al., 2015; Homel et al., 2014; Jiang et al., 2013). As such, research has found that marijuana use is prevalent among U.S. adolescents and a relationship exists between marijuana use and achievement. The factors that influence marijuana use among adolescents may include risk perception of marijuana use, as well as the influence of peers, parents, and school level factors. This study seeks to assess these relationships among adolescents participating in a national study of substance use.

Marijuana use remains prevalent with 36.8% of adolescents in the U.S. reporting lifetime use in 2019 (CDC, 2019a). One factor that may contribute to marijuana use among adolescents is perception of risk. Some research has identified that perception of risk of marijuana does influence use. Miech et al. (2017) found that perceived risk of harm of marijuana use was a strong indicator of use with those indicating low-risk being significantly more likely to have used marijuana. Another study found that adolescents who perceived no risk/slight risk of monthly marijuana use were twice as likely to have used marijuana in the past year (Chadi et al., 2020). These studies suggest that perception of risk is related to marijuana use, yet according to the Monitoring the Future Study only 12.7% of 12th graders, 22.6% of 10th graders, and 28.2% of eight graders perceived occasional marijuana use as risky (Miech et al., 2020).

Parental factors, such as relationship strength and parental disapproval of substance use, has also been shown to have an influence on substance use among adolescents. Research has shown that adolescents are less likely to engage in substance use when there is strong parental disapproval of substance use (Su and Supple, 2016; Villagrana, Lee, 2018). One study found that there was an association between poor parent-adolescent relationship and alcohol use, marijuana use, and binge drinking (Rusby et al., 2018). Another parental factor to consider when looking at adolescent substance use is parental involvement and support. Research has found that parents who actively participates in their child's life, such as checking homework and providing praise, typically have children that are less likely to engage in substance use (Barnes et al., 2006; Bryant et al., 2003; Hayakawa et al., 2016). Criss et al. (2015) found a direct significant relationship between parental involvement and substance use among low income adolescents living in high-risk neighborhoods. Those adolescents that received high parental involvement were found to be less involved with substance use compared to those adolescents with parents who provided little involvement and support. Another study found parental involvement was associated with less adolescent involvement with alcohol, tobacco, and marijuana use (Cox et al., 2021).

Adolescent substance use may also be influenced by peer factors. Peer factors include friends approval of substance use, peer substance use, and social norms within school and friend groups (Merianos et al., 2017; Su, Supple, 2016). Findings have shown that normative climates of substance use within schools and between peers (i.e., attitudes, beliefs, behaviors, values) are important when looking at adolescent substance use (Thrash, Warner, 2016). Peer substance use and individual-level adolescent substance use have been found to have a positive association with use (Su, and Supple, 2016). Leban and Griffin (2020) found that the proportion of peers using

marijuana had the strongest impact on whether an individual would engage in the behavior. The normative climate may also be found in the smaller friend groups adolescents tend to form. One study found that there was an increased chance of lifetime alcohol and marijuana use when there was high perceived friend approval of usage and low perception of risk associated with the behavior (Merianos et al., 2017).

School factors have also been researched as a protective factor for substance use. Studies have found that adolescents who felt school was important were less likely to engage in substance use (Gaete et al., 2018; Mariani and Williams, 2021; Patte et al., 2017). For example, Mulla et al. (2020) found that adolescents who had a strong connection with school were significantly less likely to use marijuana or be a heavy drinker. Ladis et al. (2021) conducted a study on substance use initiation among middle school adolescents and found that low school connection was a predictor for deviant peer affiliation which in turn influenced substance use initiation including marijuana use. Other studies have found similar results in that low school connection was related to substance use including marijuana use among adolescents (Weatherson et al., 2018; Williams et al., 2020).

The studies reviewed in this introduction have found that parental, peer, and school factors are associated with marijuana use. Risk perception of monthly or lifetime use of marijuana has also been found to be associated with marijuana use. Most studies to date have not focused on the perception of risk of weekly marijuana use and the influence of parents, peers, and school factors (Chadi, 2020; Mariani, et al., 2021). Perception of risk of weekly marijuana use has been on the decline with 40.6% of adolescents indicating that weekly marijuana use was a risk in 2015 (SAMHSA, 2019) compared to a low of 27% in 2020 (SAMHSA, 2020a). Since there has been a decline in risk perception of weekly marijuana use, this study sought to assess whether perceived risk of weekly marijuana use, instead of monthly/lifetime use, was associated with parental, peer, school factors, and lifetime substance use among adolescents 12–17 years of age participating in a national study of substance use.

Methods

Procedures

Data for this study was derived from the 2020 National Survey on Drug Use and Health (NSDUH) (SAMHSA, 2020c). The NSDUH assesses the prevalence of tobacco, alcohol, illicit drugs, and mental health problems among the noninstitutionalized U.S. population 12 years of age and older. The study is an annual, national survey and employs a multistage probability sampling design. Data are collected through in-person interviews conducted at individuals' households. Computer technology is used to allow for computer-assisted self-interviewing in order to provide a private and confidential setting for participants. For 2020, 32,893 participants participated in the study. A detailed description of the methodology used for the NSDUH has been published elsewhere (SAMHSA, 2020b).

Subjects

Participants for this study consisted of 3216 adolescents between the ages of 12 and 17. The mean age was 15.5 with an equal proportion of males to females. Whites consisted of the majority of the sample (60.8%) followed by Hispanic (22.2%) and African American (17.0%).

Measures and Data Analysis

The dependent variable for this study was perceived risk of harm from weekly marijuana use and came from the question "How much do people risk harming themselves physically and in other

ways when they smoke marijuana once or twice a week?" and response choices consisted of great risk, moderate risk, slight risk, or no risk. This variable was recoded to risk versus no risk with risk consisting of great risk, moderate risk, and slight risk responses. We dichotomized the perceived risk variable in order to allow for modeling of those who perceived no risk versus those who perceived risk of weekly marijuana use. This is the same approached used by SAMHSA (2020b).

The independent variables consisted of parental factors, peer factors, school factors, and lifetime cigarettes, alcohol, illicit drug, and non-prescription drug misuse. Parental factors consisted of the following questions: *During the past 12 months did your parent* 1) check if your homework was done, 2) helped with homework, 3) limited time out on school nights, 4) tell you that you had done something good, and 5) tell you that they were proud of you. These variables were dichotomized to never/seldom and sometimes/always.

Peer factors consisted of the two questions. "How many of the students in your grade at school would you say use marijuana?" This variable was recoded from a 4-point Likert scale to a dichotomous variable consisting of most/all to none/few. The second peer factor question was "How do you think your close friends would feel about you using marijuana monthly?" This variable was recoded from a 4-point Likert scale to a dichotomous variable consisting of strongly/somewhat disapprove to neither approve/disapprove.

School factors consisted of two questions. "During the past 12 months did your teacher tell you that you had done a good job?" This variable was recoded from a 4-point Likert scale to a dichotomous variable consisting of always/sometime to seldom/never. The second school factor question was "During the past 12 months how did you feel overall about going to school?" This variable was recoded from a 4-point Likert scale to a dichotomous variable consisting of liked a lot/kind of like to didn't like very much/hated.

Lifetime cigarettes, alcohol, illicit drug, and non-prescription drug abuse were measured with dichotomous questions asking if the adolescent had ever used the four substances. The dichotomization of the independent variables was based on the practices SAMSHA uses for analyzing NSDUH data (SAMHSA, 2020b).

In order to describe the sample frequencies were conducted of all demographic variables. These variables included age, sex, and race/ethnicity. Secondly, chi-square analysis was conducted with perceived risk of weekly marijuana use and parent, peer, school factors, and lifetime substance use. Secondly, logistic regression was conducted to determine if a relationship existed between perceived risk of weekly marijuana use and parent, peer, school factors, and lifetime substance use controlling for age, race/ethnicity, and sex.

Results

Of the 3216 adolescents aged 12-17, 27% reported perceived risk of weekly marijuana use. Table 1 shows prevalence of perceived risk of weekly marijuana use and parental, peer, school factors, and lifetime cigarette, alcohol, illicit drug, and non-medical prescription drug use. The results of this study found that more females than males (55.3%, 44.7%) perceived risk from weekly marijuana use ($x^2(1) = 12.05$; $p < .001$). Adolescents whose parent(s) voiced that they were proud of them reported greater perception of risk (86.5%, 13.5) compared to those adolescents whose parent(s) did not provide praise ($x^2(1) = 19.76$; $p < .001$). Students who liked going to school were more likely to report perceived risk of weekly marijuana use (78.7%, 21.3%) compared to those students who did not like going to school ($x^2(1) = 32.50$; $p < .001$). Greater perception of risk of weekly marijuana use was found between those who had never used alcohol ($x^2(1) = 206.95$; $p < .001$) or illicit drugs ($x^2(1) = 210.03$; $p < .001$) and those adolescents who had used the two substances. It was also found that adolescent who perceived risk of weekly marijuana use were more likely to have close friends who disapproved of marijuana use (95.0%, 5.0%)

Table 1. Perceived Risk of Weekly Marijuana Use Among U.S. Adolescents.

	Risk of Marijuana Use	
Item	%	N
Race		
White	63.9	494
Black	14.6	113
Hispanic	21.5	166
Age		
12-13	0.4	12
14-15	55.5	421
16-17	44.1	335
Sex		
Male	44.7	384
Female	55.3	475
Parent checks if homework was done		
Always/Sometimes	84.3	624
Seldom/Never	15.7	116
Parent tells adolescent they have done a good job		
Always/Sometimes	86.5	655
Seldom/Never	13.5	102
Parent tells adolescent they are proud of them		
Always/Sometimes	86.5	656
Seldom/Never	13.5	102
Parent limits time out on school nights		
Always/Sometimes	62.8	456
Seldom/Never	37.2	270
Parent helps with home work		
Always/Sometimes	81.8	604
Seldom/Never	18.2	134
Teacher lets adolescent know they did a good job		
Always/Sometimes	76.4	565
Seldom/Never	23.6	175
How adolescent feels about going to school		
Liked	78.7	584
Didn't Like	21.3	158
Lifetime cigarette use		
Never used	87.0	659
Used	13.0	101
Lifetime alcohol use		
Never used	83.2	715
Used	16.8	144
Lifetime illicit drug use		
Never used	88.9	764
Used	11.1	95
Lifetime Rx drug misuse		
Never used	97.4	839
Used	2.3	20

Table 1. (continued)

	Risk of Marijuana Use	
Item	%	N
Close friends disapprove of monthly marijuana use		
Strongly/Somewhat disapprove	95.0	717
Neither approve/disapprove	5.0	38
Students in your grade use marijuana		
Most/All	17.2	122
None/Few	82.8	588

($x^2(1) = 309.42$; $p < .001$. Additionally, adolescents who felt that none/few students in their grade used marijuana had greater perception of risk (82.8%, 17.2%) compared to those who felt all/most students in their grade used marijuana ($x^2(1) = 108.36$; $p < .001$).

Table 2 shows odds ratio and 95% confidence intervals for perceived risk of weekly marijuana use. Females were significantly more likely to report perceived risk of weekly marijuana use compared to males (OR = 1.54, CI = 1.26-1.89). Adolescents whose parent(s) voiced that they were proud of them were 1.51 (CI = 1.05-2.18) times more likely to indicate risk of weekly marijuana use compared to adolescents whose parent(s) did not provide praise. Adolescents who liked going to school were 1.38 (CI = 1.09-1.74) times more likely to indicate risk of weekly marijuana use compared to those adolescents who did not like school. Lifetime alcohol and illicit drug use were found to be significant with adolescents who had never used these substances being 2.00 (CI = 1.54-2.61) and 3.04 (1.79-5.13) times more likely to report perceived risk of weekly marijuana use compared to those adolescents who reported use. Adolescents who reported that close friends disapprove of marijuana use were 4.89 (CI = 3.41-7.02) times more likely to report perceived risk of weekly marijuana use. Lastly, those students who reported that none/few students in one's grade used marijuana were 1.60 times (CI = 1.24-2.07) times more likely to perceive risk of marijuana compared to those who reported all/most of students in one's class used marijuana.

Discussion

This purpose of this study was to assess the relationship of perceived risk of weekly marijuana use and whether parental, peer, school factors, and lifetime substance use were predictors among adolescents 12–17 years of age participating in a national study of substance use. The results of study found that parent, peer, and school factors were predictive of perceived risk of weekly marijuana use among the sample of adolescents. Specifically, those students who reported strong parental involvement and support, peer disapproval, low perception of peer use, and enjoyed school were more likely to report that using marijuana weekly was a risk behavior. Additionally, those who reported no lifetime alcohol or illicit drug use were significantly more likely to view weekly marijuana use as a risk behavior.

These results are similar to other research that assessed monthly risk perception of marijuana among adolescents. For example, Hayakawa et al. (2016), Barnes et al. (2006), and Bryant et al. (2003) found that parents who were involved with their adolescents' education and provided support were significantly less likely to report lifetime marijuana use and more likely to see monthly marijuana use as a risk behavior. Additionally, peer disapproval and low perception of peer use were found to be predictive of risk perception in the current study. Merianos et al. (2017) and Su & Supple (2016) found that friend disapproval of substance use, low perception of friend substance use, and social norms were significantly associated with whether an adolescent

Table 2. Odds Ratio and 95% Confidence Intervals for Perceived Risk of Weekly Marijuana Use Among U.S. Adolescents.

Item	OR	95% CI
Race		
White[a]		
Black	.63	.44–1.91
Hispanic	.80	.62–1.04
Age		
12–13[a]		
14–15	1.46	.26–8.18
16–17	1.43	.25–8.00
Sex		
Male[a]		
Female	1.54*	1.26–1.89
Parent checks if homework was done	1.12	.85–1.49
Parent tells adolescent they have done a good job	.71	.49–1.04
Parent tells adolescent they are proud of them	1.51*	1.05–2.18
Parent limits time out on school nights	1.08	.88–1.32
Parent helps with home work	.32	.04–2.47
Teacher lets adolescent know they did a good job	1.02	.81–1.28
How adolescent feels about going to school	1.38*	1.09–1.74
Lifetime cigarette use (none)	1.48	.86–2.56
Lifetime alcohol use (none)	2.00*	1.54–2.61
Lifetime illicit drug use (none)	3.04*	1.79–5.13
Lifetime Rx drug misuse (none)	.79	.39–1.60
Close friends disapprove of marijuana use	4.89*	3.41–7.02
Students in your grade use marijuana	1.60*	1.24–2.07

[a]= reference group.
*= significant < .05.

perceived that substance use was a risk behavior. Also, never engaging in lifetime alcohol or illicit drug use were significantly associated with perception of risk among adolescents in the present study. This is similar to other studies in that abstaining has been shown to be associated with perception of marijuana risk among adolescent (Barrett, Bradley, 2016; Chadi, et al., 2020; Hanauer et al., 2021; Kilmer et al., 2007).

The results of this study must be considered in light of several limitations. First, the study was cross-sectional. Thus, the temporality of associations cannot be determined. Second, this study was self-reported behaviors of adolescents. There is no way to ensure the accuracy of the responses such as under or over reporting behaviors, however, the questions have been shown to demonstrate good test-retest reliability (SAMHSA, 2020b). Third, these data apply to adolescents who attend school. They are not representative of all persons in the age group. Lastly, perceived risk of weekly marijuana use was assessed with one standardized question. Risk perception of weekly marijuana use may be more complex than can be assessed with one standardized question.

Conclusions

Substance use continues to be a common problem among adolescents in the U.S. For example, 36.8% of adolescents have tried marijuana and 21.7% are current marijuana users (CDC, 2019a).

Risk perception may be a protective factor that prevents certain substance use behavior. According to the Health Belief Model, perception of risk (susceptibility, severity) of a behavior influences intentions to engage in that behavior (Glanz et al., 2015). If an individual perceives that one's choices may produce a health threat, he/she may be less likely to engage in that behavior (Chadi, et al., 2020; Sarvet et al., 2018). The results of this study found that risk perception of weekly marijuana use among adolescents was influenced by parental, peer, and school factors. This study further adds evidence of the influence of parental, peer, and school factors as effective strategies to control adolescent marijuana use. As such, there is a need for multidimensional programs that target adolescents' perceptions of risk regarding marijuana use and those significant others that may influence one's perceptions.

Declaration of conflicting interests

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