



October 2019

Negative School Experiences and Pain Reliever Misuse among a National Adolescent Sample

Kelsi J. Wood

University of Cincinnati - Main Campus, wood2ki@mail.uc.edu

Keith A. King

University of Cincinnati - Main Campus, keith.king@uc.edu

Rebecca A. Vidourek

University of Cincinnati - Main Campus, rebecca.vidourek@uc.edu

See next page for additional authors

Follow this and additional works at: <https://newprairiepress.org/hbr>

 Part of the [Public Health Education and Promotion Commons](#)



This work is licensed under a [Creative Commons Attribution-Noncommercial 4.0 License](#)

Recommended Citation

Wood, Kelsi J.; King, Keith A.; Vidourek, Rebecca A.; and Merianos, Ashley L. (2019) "Negative School Experiences and Pain Reliever Misuse among a National Adolescent Sample," *Health Behavior Research: Vol. 2: No. 4*. <https://doi.org/10.4148/2572-1836.1061>

This Research Article is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Health Behavior Research by an authorized administrator of New Prairie Press. For more information, please contact cads@k-state.edu.

Negative School Experiences and Pain Reliever Misuse among a National Adolescent Sample

Abstract

A recent public health concern is the nonmedical use of prescription drugs among U.S. adolescents. The purpose of this study was to determine the relationship between negative school experiences and lifetime and past year pain reliever misuse among adolescents enrolled in high school nationwide. A secondary analysis was performed using the National Survey on Drug Use and Health 2017 data. Participants included 8,337 adolescents enrolled in 9th -12th grades. A total of 6.0% of high school students reported they had misused pain relievers in their lifetime, and 3.9% reported they had misused pain relievers during the past year. High school students who reported the following negative school experiences were at increased odds of reporting lifetime pain reliever misuse: liked/hated going to school (adjusted OR [aOR] = 2.04, 95% confidence interval [CI] = 1.66-2.50); felt their coursework was somewhat/very boring (aOR = 1.81, 95%CI = 1.48-2.22), seldom/never meaningful (aOR = 2.01, 95%CI = 1.64-2.45), and/or would be somewhat/very unimportant to them later in life (aOR = 1.64, 95%CI = 1.33-2.01); and had teachers who seldom/never let them know they were doing a good job (aOR = 1.71, 95%CI = 1.40-2.09). High school students who had a "D" grade average or lower (aOR = 2.69, 95%CI = 1.89-3.82) and skipped school on at least one day (aOR = 2.18, 95%CI = 1.76-2.70) were more likely to report lifetime use. Similar significant findings were reported between negative school experiences and past year pain reliever misuse. Negative school experiences are risk factors for lifetime and past year pain reliever misuse among U.S. adolescents. Programming that reduces students' negative school experiences may create a positive environment, and in turn, reduce misuse.

Keywords

nonmedical prescription drug use; pain relievers; negative school experiences; adolescence

Acknowledgements/Disclaimers/Disclosures

The authors have no conflicts of interest to report, financial or otherwise.

Authors

Kelsi J. Wood, Keith A. King, Rebecca A. Vidourek, and Ashley L. Merianos

Negative School Experiences and Pain Reliever Misuse among a National Adolescent Sample

Kelsi J. Becker, PhD
Keith A. King, PhD, MCHES
Rebecca A. Vidourek, PhD, CHES
Ashley L. Merianos, PhD, CHES*

Abstract

A recent public health concern is the nonmedical use of prescription drugs among U.S. adolescents. The purpose of this study was to determine the relationship between negative school experiences and lifetime and past year pain reliever misuse among adolescents enrolled in high school nationwide. A secondary analysis was performed using the National Survey on Drug Use and Health 2017 data. Participants included 8,337 adolescents enrolled in 9th -12th grades. A total of 6.0% of high school students reported they had misused pain relievers in their lifetime, and 3.9% reported they had misused pain relievers during the past year. High school students who reported the following negative school experiences were at increased odds of reporting lifetime pain reliever misuse: liked/hated going to school (adjusted OR [aOR] = 2.04, 95% confidence interval [CI] = 1.66-2.50); felt their coursework was somewhat/very boring (aOR = 1.81, 95%CI = 1.48-2.22), seldom/never meaningful (aOR = 2.01, 95%CI = 1.64-2.45), and/or would be somewhat/very unimportant to them later in life (aOR = 1.64, 95%CI = 1.33-2.01); and had teachers who seldom/never let them know they were doing a good job (aOR = 1.71, 95%CI = 1.40-2.09). High school students who had a “D” grade average or lower (aOR = 2.69, 95%CI = 1.89-3.82) and skipped school on at least one day (aOR = 2.18, 95%CI = 1.76-2.70) were more likely to report lifetime use. Similar significant findings were reported between negative school experiences and past year pain reliever misuse. Negative school experiences are risk factors for lifetime and past year pain reliever misuse among U.S. adolescents. Programming that reduces students’ negative school experiences may create a positive environment, and in turn, reduce misuse.

*Corresponding author can be reached at: ashley.merianos@uc.edu

Introduction

Over the last decade, a public health concern has been the nonmedical use of prescription drugs (NMPDs) among U.S. adolescents (Center for Behavioral Health Statistics and Quality, 2017). NMPD misuse occurs when a medication is used other than prescribed, such as taking it to get “high” or mixing the medication with alcohol or other drugs (National Institute on Drug Abuse [NIDA], 2018). Another common way NMPDs are misused is by taking someone else’s prescription medication. Prescription drugs can have the same addictive properties as illegal drugs if misused (Schelle, Faulmüller, Caviola, & Hewstone, 2014). One of the main prescription drug classifications that is commonly used for nonmedical purposes is pain relievers (e.g., opioids; NIDA, 2018). When prescription pain relievers are misused, similar to heroin, the body enters a euphoric state where breathing becomes labored (NIDA, 2018). Unfortunately, unintended overdose deaths related to prescription opioids among individuals of all ages

quadrupled from about 3,400 deaths in 1999 to about 17,000 deaths in 2017, urging for more prevention and intervention efforts (NIDA, 2018).

Specifically looking at narcotic misuse (other than heroin) among 12th graders, 6.8% had misused narcotics in their lifetime, 4.2% had misused in the past year, and 1.6% had misused in the past month (NIDA, 2018). Regarding sex differences during adolescence, females enrolled in 9th -11th grades have higher rates of pain reliever misuse than males, but males enrolled in the 12th grade have higher rates of NMPD misuse than females (Johnston et al., 2019). As grade level increases, so does misuse of pain relievers for both males and females (Johnston et al., 2019). Ease of access may be a contributing factor to NMPD misuse among older adolescents. In 2017, one-third (33%) of 12th graders reported it was fairly easy or very easy to get narcotics compared to 8% of 8th graders (Johnston et al., 2018). Risk perceptions can also influence misuse behavior, and many physical, mental, and emotional issues can arise from adolescent use. Adolescents report low perceived risk of NMPD use due to their legal use for prescribed reasons such as pain, decreasing anxiety, or attention deficit disorders (Johnston et al., 2019). Additionally, those who misuse prescription drugs are at greater risk of using other substances like alcohol, tobacco, marijuana, and cocaine (McCabe, West, Teter, & Boyd, 2012). Prior research indicates that adolescents who misuse pain relievers are 19 times more likely to initiate heroin use than those who have not misused pain relievers (Jones, Muhuri, & Lurie, 2017).

Along with low perception of risk and ease of accessibility, negative school experiences have been identified as a strong predictor of substance use (Ford, 2009; King, Vidourek, Merianos, & Bartsch, 2015; Merianos, Vidourek, Nabors, & King, 2015). Specifically, negative school influences have been identified as a risk factor for frequent cigarette smoking, binge drinking, and marijuana use among adolescents (Weatherson et al., 2018). Concurrent results were recognized among street-involved youth; street-involved youth who have negative school experiences were at higher odds of heavy alcohol and marijuana use (Rivers, Saewyc, Frankish, & Warf, 2015). Hispanic youth are also impacted by negative school experiences, reporting higher rates of alcohol use and binge drinking (Merianos et al., 2015) and marijuana use (King et al., 2015). Students lacking high involvement and interactions with their parents or teachers report higher rates of over-the-counter (OTC) drug abuse (King, Vidourek, & Merianos, 2013a). Conversely and specific to NMPDs, junior high and high school students who have parents and/or teachers who communicated the dangers related to drug use had significantly lower rates of lifetime NMPD use (King, Vidourek, & Merianos, 2013b).

Limited research has assessed the relationship between school experiences and pain reliever misuse among high school students nationwide. Much of the literature has focused on other potential risk factors such as peer norms, childhood trauma, and socioeconomic influences on pain reliever misuse (Ford, Sacra, & Yohros, 2017; Oluwoye, Merianos, & Nabors, 2017; Quinn et al., 2016; Quinn et al., 2019). Thus, assessing school-related risk factors may be beneficial for guiding future improvements in school-based substance use programs. Therefore, the purpose of this study was to determine the relationship between negative school experiences (e.g., didn't like very much/hated going to school) and lifetime and past year pain reliever misuse among adolescents enrolled in high schools nationwide.

Methods

Participants and Procedures

The present study was a secondary analysis of 2017 National Survey on Drug Use and Health (NSDUH) data. Participants included in the study were 9th -12th grade students ($N = 8,337$). The NSDUH is administered and managed by the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) to investigate the national prevalence of substance use in individuals aged 12 years and older. A three-stage cluster sample design was used to recruit participants in their own homes. Trained interviewers determined eligible participants and aided them with the completion of a computer-assisted interview survey. Overall, a total of 68,032 interviews were completed in 2017; the weighted screening response rate was 75.1% and the weighted interview response rate was 67.1% (Center for Behavioral Health Statistics and Quality, 2018). The NSDUH is reliable and valid (SAMHSA, 2010). For more information on the methodology used for the NSDUH, please refer to the 2017 Methodological Resource Book (Center for Behavioral Health Statistics and Quality, 2018). A university-based institutional review board determined the current study as “not human subjects research” and was exempted from review.

Instrumentation

To screen for pain reliever misuse, participants were asked to look at the names and pictures of pain relievers and answer the following two questions: (1) “Have you ever, even once, used any prescription pain reliever in any way a doctor did not direct you to use it?” (yes, no); and (2) “In the past 12 months, did you use any prescription pain reliever in a way a doctor did not direct you to use it?” (yes, no).

Seven questions assessed students’ negative school experiences in the past 12 months of NSDUH completion: (1) overall feelings about going to school (liked a lot/kind of liked, didn’t like very much/hated); (2) how important things they learned in school are going to be to them later in life (very/somewhat important, somewhat/very unimportant); (3) how interesting most of their courses have been (very/somewhat interesting, somewhat/very boring); (4) how often they felt their school work was meaningful and important (always/sometimes, seldom/never); (5) how often their teachers let them know they were doing a good job with school work (always/sometimes, seldom/never); (6) grades for their last grading period (A, B, C, D or lower); and (7): How many days they skipped school because they did not want to be there (0 days, ≥ 1 day). Recoded variables provided by the NSDUH are strongly encouraged for use. All dichotomized variables were provided by NSDUH based on splitting response options for each of these questions into two groups (e.g., always/sometimes, seldom/never) and were used for analyses (Center for Behavioral Health Statistics and Quality, 2018).

Sociodemographic variables were recoded by NSDUH and included sex (male, female), race/ethnicity (non-Hispanic white, non-Hispanic black/African American, non-Hispanic Native American/Alaska Native, non-Hispanic Asian, non-Hispanic more than one race, and Hispanic), grade level (9th, 10th, 11th, 12th), and federal poverty level (FPL) that was calculated based on the participant’s age, family size, number of children residing in the home, and total family income (living in poverty, income up to two times the federal poverty threshold, and income more than two times the federal poverty threshold). Due to skewed distributions, race/ethnicity was

collapsed into four categories: non-Hispanic white, non-Hispanic black/African American, Hispanic, and other non-Hispanic (Native American/Alaska Native, Asian, non-Hispanic more than one race).

Statistical Analysis

IBM SPSS 24.0 was used for data analyses. Descriptive statistics were performed for lifetime and past year pain reliever misuse and sociodemographics. We performed unadjusted logistic regression analyses to assess the relationships between sociodemographics and lifetime and past year pain reliever misuse. Seven multivariable logistic regression models were built to assess the relationship between each of the negative school experience variables and lifetime pain reliever misuse among adolescents, while adjusting for the sociodemographics. Seven similar models were built for past year pain reliever misuse. We followed the NSDUH 2017 codebook's (Center for Behavioral Health Statistics and Quality, 2018) recommendations for analysis and weighted data for unbiased estimates. We used statistically imputed variables provided by NSDUH to substitute acceptable estimated values in order to replace missing values. When variables were not imputed, we removed missing cases prior to analysis. The alpha level of significance was set at < 0.004 to adjust for multiple comparisons using the Bonferroni correction.

Results

Regarding sex, 50.5% were female and high school grade levels were near equal in distribution (Table 1). Over half of participants were non-Hispanic white (51.7%) and had an income over two times the FPL (58.1%). Overall, 6.0% ($n = 513$) of high school students reported they had misused pain relievers in their lifetime, and 3.9% ($n = 334$) reported past year misuse. The top five pain relievers reported by students included Hydrocodone (13.4%; $n = 44$), Percocet (8.5%; $n = 28$), OxyContin (7.9%; $n = 26$), Oxycodone (6.7%; $n = 22$), and some other pain reliever not listed (17.4%; $n = 57$).

Males were less likely to report lifetime pain reliever misuse than females (Table 1). Students in the 11th and 12th grades were more likely to report lifetime and past year pain reliever misuse than those enrolled in the 9th grade.

Students who did not like/hated going to school were more likely to report lifetime (adjusted odds ratio [aOR] = 2.04, 95% confidence interval [CI] = 1.66-2.50) and past year (aOR = 2.31, 95%CI = 1.80-2.96) pain reliever misuse than students who liked/kind of liked going to school, while controlling for students' sociodemographics (Table 2). Students who thought their coursework would be somewhat/very unimportant to them later in life were more likely to report lifetime (aOR = 1.64, 95%CI = 1.33-2.01) and past year (aOR = 1.44, 95%CI = 1.11-1.86) pain reliever misuse. Those who felt their coursework was somewhat/very boring were more likely to report lifetime (aOR = 1.81, 95%CI = 1.48-2.22) and past year (aOR = 1.76, 95%CI = 1.38-2.26) pain reliever misuse. Students who reported their schoolwork was seldom/never meaningful were more likely to report lifetime (aOR = 2.01, 95%CI = 1.64-2.45) and past year (aOR = 1.92, 95%CI = 1.50-2.45) misuse. Those who reported their teacher seldom/never let them know they were doing a good job were more likely to report lifetime (aOR = 1.71, 95%CI = 1.40-2.09) and

Table 1

Sociodemographic Characteristics and Pain Reliever Misuse among Adolescents, NSDUH 2017

Variable	Lifetime Use			Past Year Use	
	<i>n</i> (%) ^a	OR (95%CI)	<i>P</i> Value	OR (95%CI)	<i>P</i> Value
Sex					
Male	4,173 (49.5)	0.69 (0.57-0.82)	<0.001	0.85 (0.68-1.06)	0.141
Female	4,164 (50.5)	(Ref)		(Ref)	
Grade					
9th grade	2,192 (25.4)	(Ref)		(Ref)	
10th grade	2,083 (24.1)	1.11 (0.84-1.47)	0.464	1.34 (0.94-1.91)	0.103
11th grade	2,182 (25.4)	1.49 (1.14-1.93)	0.003	1.69 (1.21-2.36)	0.002
12th grade	1,880 (25.1)	1.93 (1.49-2.49)	<0.001	2.35 (1.70-3.26)	<0.001
Race/Ethnicity					
Non-Hispanic White	4,355 (51.7)	(Ref)		(Ref)	
Non-Hispanic Black/African American	1,095 (13.7)	0.99 (0.75-1.32)	0.99	0.93 (0.65-1.33)	0.697
Hispanic	1,882 (24.3)	1.17 (0.94-1.46)	0.15	1.24 (0.95-1.61)	0.114
Non-Hispanic Other ^b	1,005 (10.3)	0.99 (0.74-1.32)	0.93	1.07 (0.76-1.52)	0.691
Income Level					
Poverty	1,688 (20.8)	1.23 (0.99-1.53)	0.067	1.13 (0.86-1.49)	0.367
Income up to 2x FPL	1,818 (21.1)	1.04 (0.83-1.30)	0.767	0.89 (0.67-1.19)	0.430
Income more than 2x FPL	4,831 (58.1)	(Ref)		(Ref)	

Note. Abbreviations: NSDUH, National Survey on Drug Use and Health; OR, odds ratio; CI, confidence interval; ref, reference category; FPL, federal poverty level. *N* = 8,337.

^a*n* is raw *n* and percent refers to weighted valid percent; missing values excluded.

^bNon-Hispanic other category included non-Hispanic Native American/Alaska Native, non-Hispanic Asian, non-Hispanic more than one race.

Table 2

Negative School Experiences and Pain Reliever Misuse among Adolescents, NSDUH 2017

School-related Variable	Pain Reliever Misuse Lifetime				Pain Reliever Misuse Past Year			
	Did Not Use <i>n</i> (%) ^a	Used <i>n</i> (%) ^a	aOR (95% CI) ^b	<i>P</i> value	Did Not Use <i>n</i> (%) ^a	Used <i>n</i> (%) ^a	aOR (95% CI) ^b	<i>P</i> value
How you felt about going to school								
Liked a lot/kind of liked	5,451 (95.3)	281 (4.7)	(Ref)		5,560 (97.2)	172 (2.8)	(Ref)	
Didn't like very much/hated	1,492 (91.0)	158 (9.0)	2.04 (1.66-2.50)	<0.001	1,540 (93.5)	110 (6.5)	2.31 (1.80-2.96)	<0.001
How important are your courses for later in life								
Very/somewhat important	5,312 (95.0)	292 (5.0)	(Ref)		5,410 (96.6)	194 (3.4)	(Ref)	
Somewhat/very unimportant	1,628 (92.4)	146 (7.6)	1.64 (1.33-2.01)	<0.001	1,686 (95.5)	88 (4.5)	1.44 (1.11-1.86)	0.006
How interesting is most of your coursework								
Very/somewhat interesting	5,163 (95.0)	273 (5.0)	(Ref)		5,260 (96.9)	176 (3.1)	(Ref)	
Somewhat/very boring	1,779 (92.3)	166 (7.7)	1.81 (1.48-2.22)	<0.001	1,839 (94.9)	106 (5.1)	1.76 (1.38-2.26)	<0.001
How meaningful is your school work								
Always/sometimes	5,087 (95.2)	254 (4.8)	(Ref)		5,177 (96.8)	164 (3.2)	(Ref)	
Seldom/never	1,851 (92.1)	184 (7.9)	2.01 (1.64-2.45)	<0.001	1,918 (95.0)	117 (5.0)	1.92 (1.50-2.45)	<0.001
Teacher let you know you were doing a good job								
Always/sometimes	5,101 (94.9)	270 (5.1)	(Ref)		5,189 (96.6)	182 (3.4)	(Ref)	
Seldom/never	1,834 (92.8)	169 (7.2)	1.71 (1.40-2.09)	<0.001	1,903 (95.7)	100 (4.3)	1.47 (1.14-1.89)	0.003
Grade average								
A, B, or C	6,413 (94.5)	388 (5.5)	(Ref)		6,553 (96.4)	248 (3.6)	(Ref)	
D or Lower	260 (88.5)	41 (11.5)	2.69 (1.89-3.82)	<0.001	274 (91.8)	27 (8.2)	2.70 (1.77-4.12)	<0.001
Days skipped school								
0 days	4,979 (95.3)	242 (4.7)	(Ref)		5,069 (97.0)	152 (3.0)	(Ref)	
>1 day	1,350 (91.4)	153 (8.6)	2.18 (1.76-2.70)	<0.001	1,404 (94.4)	99 (5.6)	2.21 (1.70-2.88)	<0.001

Note. Abbreviations: NSDUH, National Survey on Drug Use and Health; FPL, federal poverty level, aOR, adjusted odds ratio, CI, confidence interval; ref, reference category. *N* = 8,337;

^a*n* is raw *n* and percent refers to weighted valid percent; missing values excluded.

^bAnalysis adjusted for sex, age, race/ethnicity, and federal poverty level.

past year (aOR = 1.47, 95%CI = 1.14-1.89) pain reliever misuse. Students who had “D” grade averages or lower were more likely to report lifetime (aOR = 2.69, 95%CI = 1.89-3.82) and past year (aOR = 2.70, 95%CI = 1.77-4.12) pain reliever misuse than those who reported higher than “D” grade averages. Students who reported skipping school on at least one day because they did not want to be there were more likely to report lifetime (aOR = 2.18, 95%CI = 1.76-2.70) and past year (aOR = 2.21, 95%CI = 1.70-2.88) misuse (see Table 2).

Discussion

The purpose of the current study was to determine the relationship between negative school experiences and lifetime and past year pain reliever misuse among U.S. adolescents. Six percent of high school students reported misusing pain relievers in their lifetime, and 4% of students had misused pain relievers in the past year. These rates are concerning, and prevention efforts should be offered to combat misuse nationwide.

Our findings indicate that male adolescents were at reduced odds of reporting lifetime pain reliever misuse compared to female adolescents, but no differences were reported based on past year use. This supports previous research that found male adolescents have lower rates of NMPD misuse compared to their female counterparts (Johnston et al., 2019; Nakawaki & Crano, 2012; Vaughn et al., 2016). Other results indicate males are at greater risk for NMPD misuse (King et al., 2013b). Specific to opioid misuse, Osborne et al. (2019) found higher rates of misuse among male adolescents. Since there are inconsistencies among sex and pain reliever misuse, future research should focus on identifying what influences misuse in each group so distinctions may be addressed in future programming.

We found a linear trend between pain reliever misuse and grade level, which was consistent with previous NMPD findings (Johnston et al., 2019; King et al., 2013b; Vaughn et al., 2016; Weatherson et al., 2018). Concerning any prescription drug misuse, 15.5% of U.S. 12th grade students reported lifetime misuse and 10% reported past year misuse (Johnston et al., 2019). To compare overall NMPD misuse rates to pain reliever misuse rates, we found that 9% of 12th graders reported lifetime misuse and 6% reported past year misuse. Programs should start at high school entry, and ongoing prevention messages should continue until students graduate from high school. Future research should seek to identify ways to tailor programming to each grade level. For example, 9th grade students’ risk factors (e.g., negative school experiences) may differ from risk factors for older grade levels. Specific information can be used to adjust programming to each grade level to better tackle the needs of high school students.

Our key results suggest that students who report negative school experiences (e.g., does not like going to school) are at greater risk of misusing pain relievers than students who do not report negative school experiences. Interestingly, all negative school experiences were associated with greater odds of lifetime and past year pain reliever misuse. The influence school experiences and connectedness have on substance use behavior (e.g., cigarette smoking, alcohol use, marijuana use) has been assessed in prior research among adolescents (Forster et al., 2017; Merianos et al., 2015; Weatherson et al., 2018). Our findings parallel these by identifying negative school experiences as a major risk factor for pain reliever misuse.

The present study sought to identify the associations between pain reliever misuse and several individual negative school experiences. Specifically, nearly four in 10 adolescents (36%) who misused pain relievers in their lifetime reported they did not like or hated going to school. More research is needed to identify why students who misuse pain relievers do not like going to

school. For example, issues such as not feeling safe at school, bullying, or feeling isolated or depressed are potentially important risk factors to identify for future program planning and implementation (Burton, Marshal, & Chisolm, 2014; Gaete et al., 2017; Luk, Wang, & Simons-Morton, 2010; Wang & Fredricks, 2014). Of those who misused pain relievers in their lifetime, one-third (33%) felt their coursework would be somewhat/very unimportant to them later in life. Additionally, over one-third thought their coursework was somewhat/very boring (36%) and seldom/never meaningful (39%). Educators and administrators should be included in prevention efforts to assist students in engaging in their coursework. For instance, applying and relating coursework to a student's post-high school life may spark his/her interests. Possible tools to examine in the classroom include an aptitude test, discussing post-high school opportunities, and college and career interest surveys to determine what might be of interest to students. Researchers could help to create and implement a pre- and post-course survey to establish students' future goals and interest areas, and meaningful topics for educators to generate future coursework that aligns with mandated curriculum.

Concerning connections with teachers, 35% of adolescents who reported they had misused pain relievers in their lifetime also reported their teachers seldom/never told them they did a good job. Maintaining a respectful, open, and encouraging relationship with students could be a small incorporation that may leave a big impact on creating a safe environment for students, and in turn, potentially decrease their pain reliever misuse. Future trainings could present school faculty and staff with positive phrases and role-playing opportunities that may help with generating constructive sentences into more productive conversations with students. Adolescents who misused pain relievers in their lifetime had similar rates of skipping school (35%) and most reported D or lower grade averages (92%). Bridging the gap between research and practice is critical for decreasing pain reliever misuse among adolescents. For researchers, identifying why students do not enjoy school and think their coursework is unrelated or unimportant to their future would be helpful. All of the above recommendations may potentially decrease students' negative school experiences. However, ways to improve school experiences have not been implemented in prevention programs (Chapman, Buckley, Sheehan, & Shochet, 2013).

Currently, several programs have shown evidence in reducing prescription opioid misuse among adolescents. The Life Skills Training Program is a classroom-based program where students are taught drug awareness and social and resiliency skills. This program has shown significant results for decreasing prescription opioid misuse among middle school and high school students (Crowley, Jones, Coffman, & Greenberg, 2014). PROMoting School–community–university Partnerships to Enhance Resilience (PROSPER) has also shown evidence in reducing NMPD use among high school students (Spoth et al., 2013). The PROSPER program focuses on increasing knowledge of substance misuse norms, behaviors, peer resisting tools, and self-management. Keepin' it REAL (Refuse, Explain, Avoid, Leave) is a school-based program that utilizes a culturally grounded model for adolescents ranging from 11-18 years old. When evaluated, an increase in substance use was identified in both the intervention and control group, but the increase in use was significantly lower in the intervention group over time (Hecht, Graham, & Elek, 2006). Additionally, the control group showed greater positive expectations towards substances than those in the intervention group (Hecht et al., 2006). Although these programs have shown significant effects on decreasing substance use, there has been little evaluation on their generalizability; merging aspects from already successful programs with recommendations from the current study to create updated prevention efforts may be beneficial.

Limitations

Although using a national dataset is advantageous, there are limitations. The NSDUH uses self-report data collection; survey answers may have produced response bias persuaded by social influences. Additionally, analyses were performed using two pain reliever misuse measurements (lifetime and past year); frequency of pain reliever misuse was not taken into account. Finally, the generalizability of results are limited to high school students; more research is needed to examine the influence negative school experiences may have on other student populations.

Conclusion

The current study found that high school students were at risk for misusing pain relievers, and those who reported negative school experiences were at even greater odds for misuse. Emphasis should be placed on improving students' school experiences (e.g., engagement in schoolwork) to protect them from misusing pain relievers. This can be addressed by identifying why students feel they have negative school experiences and low connectedness to coursework, and then designing new ways educators and administrators can address these issues. Introducing feasible techniques for teachers to use in the classroom to make schoolwork feel more meaningful may be helpful (e.g., examples of how topics and information may be used after high school). Seminars for educators and administrators may help them better understand how they may influence adolescents' behavior in and out of the classroom (e.g., telling them they are doing a good job on schoolwork). Incorporating ways to decrease negative school experiences throughout the school year, in class and in prevention programs, would likely be advantageous in decreasing pain reliever misuse among adolescents.

Acknowledgements

The authors have no conflicts of interest to report, financial or otherwise.

References

- Burton, C. M., Marshal, M. P., & Chisolm, D. J. (2014). School absenteeism and mental health among sexual minority youth and heterosexual youth. *Journal of School Psychology, 52*(1), 37-47. <https://doi.org/10.1016/j.jsp.2013.12.001>
- Center for Behavioral Health Statistics and Quality. (2017). *2016 National Survey on Drug Use and Health: Detailed tables*. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Center for Behavioral Health Statistics and Quality. (2018). *2017 National Survey on Drug Use and Health final analytic file codebook*. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Chapman, R. L., Buckley, L., Sheehan, M., & Shochet, I. (2013). School-based programs for increasing connectedness and reducing risk behavior: A systematic review. *Educational Psychology Review, 25*(1), 95-114. <https://doi.org/10.1007/s10648-013-9216-4>

- Crowley, D. M., Jones, D. E., Coffman, D. L., & Greenberg, M. T. (2014). Can we build an efficient response to the prescription drug abuse epidemic? Assessing the cost effectiveness of universal prevention in the PROSPER trial. *Preventive Medicine, 62*, 71–77. <https://doi.org/10.1016/j.ypmed.2014.01.029>
- Ford, J. A. (2009). Nonmedical prescription drug use among adolescents: The influence of bonds to family and school. *Youth & Society, 40*(3), 336-352. <https://doi.org/10.1177/0044118X08316345>
- Ford, J. A., Sacra, S. A., & Yohros, A. (2017). Neighborhood characteristics and prescription drug misuse among adolescents: The importance of social disorganization and social capital. *International Journal of Drug Policy, 46*, 47-53. <https://doi.org/10.1016/j.drugpo.2017.05.001>
- Forster, M., Gloppen, K. M., Gower, A. L., Oliphant, J. A., Sieving, R. E., & McMorris, B. J. (2017). Associations between multiple dimensions of school engagement, peer relationships, and risky health behaviors among vulnerable middle school students. *Journal of Adolescent Health, 60*(2Suppl1), S31-S32. <https://doi.org/10.1016/j.jadohealth.2016.10.079>
- Gaete, J., Tornero, B., Valenzuela, D., Rojas-Barahona, C. A., Salmivalli, C., Valenzuela, E., & Araya, R. (2017). Substance use among adolescents involved in bullying: A cross-sectional multilevel study. *Frontiers in Psychology, 8*, 1056-1056. <https://doi.org/10.3389/fpsyg.2017.01056>
- Hecht, M. L., Graham, J. W., & Elek, E. (2006). The Drug Resistance Strategies intervention: Program effects on substance use. *Health Communication, 20*(3), 267–276. https://doi.org/10.1207/s15327027hc2003_6
- Johnston, L. D., Miech, R. A., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Patrick, M. E. (2019). Monitoring the Future national survey results on drug use 1975-2018: Overview, key findings on adolescent drug use. Ann Arbor, MI: Institute for Social Research, University of Michigan.
- Johnston, L. D., O'Malley, P. M., Miech, R., Bachman, J. G., Schulenberg, J. E., O'Malley, P., Patrick, M. (2018). *Monitoring the Future national results on adolescent drug use: Overview of key findings, 2017*. Ann Arbor, MI: Institute for Social Research, The University of Michigan. Retrieved from <http://www.monitoringthefuture.org/pressreleases/17drugpr.pdf>
- Jones, C. M., Muhuri, P. K., & Lurie, P. G. (2017). Trends in the nonmedical use of OxyContin, United States, 2006 to 2013. *The Clinical Journal of Pain, 33*(5), 452-461. <https://doi.org/10.1097/AJP.0000000000000426>
- King, K. A., Vidourek, R. A., & Merianos, A. L. (2013a). Psychosocial factors associated with over-the-counter drug abuse among youth. *American Journal of Health Studies, 28*(2), 68-76.
- King, K. A., Vidourek, R. A., Merianos, A. L. (2013b). Sex and grade level differences in lifetime nonmedical prescription drug use among youth. *Journal of Primary Prevention, 34*(4), 237-249. <https://doi.org/10.1007/s10935-013-0308-1>
- King, K. A., Vidourek, R. A., Merianos, A. L., & Bartsch, L. A. (2015). The impact parenting behaviors have on recent alcohol use and binge drinking among adolescents based on age. *Vulnerable Children and Youth Studies, 10*(4), 300-313. <https://doi.org/10.1080/17450128.2015.1103390>

- Luk, J. W., Wang, J., & Simons-Morton, B. G. (2010). Bullying victimization and substance use among U.S. adolescents: Mediation by depression. *Prevention Science, 11*(4), 355-359. <https://doi.org/10.1007/s11121-010-0179-0>
- McCabe, S. E., West, B. T., Teter, C. J., & Boyd, C. J. (2012). Medical and nonmedical use of prescription opioids among high school seniors in the United States. *Archives of Pediatrics & Adolescent Medicine, 166*(9), 797-802. <https://doi.org/10.1001/archpediatrics.2012.85>
- Merianos, A. L., Vidourek, R. A., Nabors, L. A., & King, K. A. (2015). School experiences associated with alcohol use among Hispanic youth. *Journal of School Health, 85*(9), 621-628. <https://doi.org/10.1111/josh.12293>
- Nakawaki, B., & Crano, W. D. (2012). Predicting adolescents' persistence, non-persistence, and recent onset of nonmedical use of opioids and stimulants. *Addictive Behaviors, 37*(6), 716-721. <https://doi.org/10.1016/j.addbeh.2012.02.011>
- National Institute on Drug Abuse. ([NIDA], 2018). Prescription opioids. Retrieved from <https://www.drugabuse.gov/publications/drugfacts/prescription-opioids>
- Oluwoye, O. A., Merianos, A. L., & Nabors, L. A. (2017). Nonmedical use of prescription drugs and peer norms among adolescents by race/ethnicity. *Journal of Substance Use, 22*(2), 199-205. <https://doi.org/10.1080/14659891.2016.1177615>
- Osborne, V., Striley, C. W., Nixon, S. J., Winterstein, A. G., & Cottler, L. B. (2019). Sex differences in patterns of prescription opioid non-medical use among 10–18 year olds in the U.S. *Addictive Behaviors, 89*, 163-171. <https://doi.org/10.1016/j.addbeh.2018.10.009>
- Quinn, K., Boone, L., Scheidell, J. D., Mateu-Gelabert, P., McGorray, S. P., Beharie, N., & Khan, M. R. (2016). The relationships of childhood trauma and adulthood prescription pain reliever misuse and injection drug use. *Drug and Alcohol Dependence, 169*, 190-198. <https://doi.org/10.1016/j.drugalcdep.2016.09.021>
- Quinn, K., Frueh, B. C., Scheidell, J., Schatz, D., Scanlon, F., & Khan, M. R. (2019). Internalizing and externalizing factors on the pathway from adverse experiences in childhood to non-medical prescription opioid use in adulthood. *Drug and Alcohol Dependence, 197*, 212-219. <https://doi.org/10.1016/j.drugalcdep.2018.12.029>
- Rivers, R., Saewyc, E. Frankish, J., & Warf, C. (2015). School connection as a protective factor against problem substance use among street-involved youth: A sequential mixed-methods study. *Journal of Adolescent Health, 56*(2Suppl1), S29. <https://doi.org/10.1016/j.jadohealth.2014.10.058>
- Schelle, K. J., Faulmüller, N., Caviola, L., & Hewstone, M. (2014). Attitudes toward pharmacological cognitive enhancement—a review. *Frontiers in Systems Neuroscience, 8*, 53. <https://doi.org/10.3389/fnsys.2014.00053>
- Spoth, R., Redmond, C., Shin, C., Greenberg, M., Feinberg, M., & Schainker, L. (2013). PROSPER community–university partnership delivery system effects on substance misuse through 6 1/2 years past baseline from a cluster randomized controlled intervention trial. *Preventive Medicine, 56*(3-4):190–196. <https://doi.org/10.1016/j.ypmed.2012.12.013>
- Substance Abuse and Mental Health Services Administration. ([SAMHSA], 2010). Reliability of Key Measures in the National Survey on Drug Use and Health. Methodology Series M-8, HHS Publication No. SMA 09-4425. Rockville, MD: Office of Applied Studies.

- Vaughn, M. G., Nelson, E. J., Salas-Wright, C. P., Qian, Z., & Schootman, M. (2016). Racial and ethnic trends and correlates of non-medical use of prescription opioids among adolescents in the United States 2004–2013. *Journal of Psychiatric Research*, 73, 17-24. <https://doi.org/10.1016/j.jpsychires.2015.11.003>
- Wang, M., & Fredricks, J. A. (2014). The reciprocal links between school engagement, youth problem behaviors, and school dropout during adolescence. *Child Development*, 85(2), 722-737. <https://doi.org/10.1111/cdev.12138>
- Weatherston, K. A., O'Neill, M., Lau, E. Y., Qian, W., Leatherdale, S. T., & Faulkner, G. E. J. (2018). The protective effects of school connectedness on substance use and physical activity. *Journal of Adolescent Health*, 63(6), 724-731. <https://doi.org/10.1016/j.jadohealth.2018.07.002>