

Substance Use and Mental Health Among Middle and High School Students: A Survey Study

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Introduction

- Adolescent substance use is a major public health concern.
- Pandemics are associated with rises in depression, anxiety, and high-risk behaviors, increasing urgency for solutions to address this public health issue.¹
- Data on the prevalence of co-occurrence of mental health comorbidities and substance use in younger adolescents is limited.²
- School-based sampling provides a valuable means to examine this issue and inform early interventions.³
- The objectives of this study were 1) to compare substance use among middle and high schoolers and 2) to describe the relationship between mental health concerns and substance use in these populations.

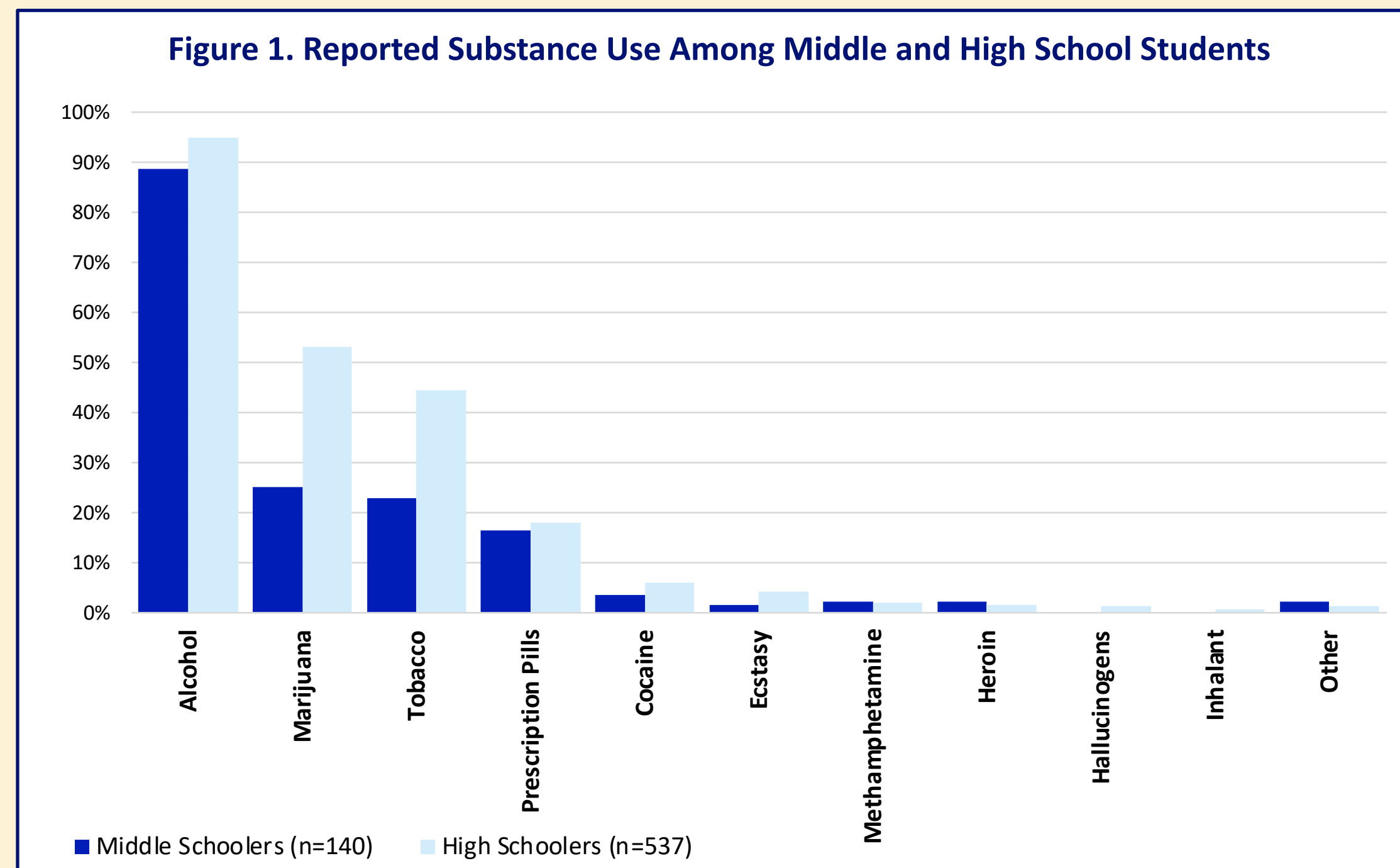
Methods

- **Study Design:** Cross-sectional, online, anonymous survey.
- **Recruitment and Sample:** Middle- and high-school students who attended educational school events across the Midwest from 2017-2020. Events were run by a non-profit, peer-led recovery organization, and focused on substance use prevention, recovery promotion, and de-stigmatization of addiction and mental health.
- **Data Analysis:** Data were analyzed using Stata 13.0. Pearson's chi-squared test was used for comparisons.

Results

- 3,617 (81.0%) of 4,463 students who initiated the survey answered questions about substance use and mental health.
- 709 (19.6%), including 162 (10.32%) middle schoolers and 547 (26.72%) high schoolers endorsed using at least one substance.
- Alcohol (93.5%), marijuana (47.3%), and tobacco (40.0%) were the most commonly reported substances used.
- Over one-third (38.8%) of students reported substance use initiation by age 13 and 6.2% indicated initiating use at age 8 or younger.

Gender	n	%
Male	1,566	43.30
Female	1,954	54.02
Non-binary	6	0.17
Transgender	54	1.49
Other	37	1.02
Age		
10-14	1,961	54.22
15-16	1,095	30.27
17-18	543	15.01
19-23	18	0.50
Race/Ethnicity		
White	3,098	85.65
Black or African American	83	2.29
Asian	102	2.82
American Indian or Alaskan Native	23	0.64
Native Hawaiian or Other Pacific Islander	13	0.36
Multiracial	180	4.98
Prefer Not to Answer	118	3.26
Grade		
6th	648	17.92
7th	534	14.76
8th	388	10.73
Freshman/9th	723	19.99
Sophomore/10th	534	14.76
Junior/11th	406	11.22
Senior/12th	372	10.28
Fifth Year/Other	12	0.33



Of the 709 students who endorsed substance use, 677 students provided additional information about their use.

	Respondents, n (%)		
	Total	Middle School	High School
Struggled with mental health disorder?	n = 3,617	1,570	2,047
Yes, n (%)	1,274 (35.22%)	432 (27.52%)	842 (41.13%)
No, n (%)	2,343 (64.78%)	1,138 (72.48%)	1,205 (58.87%)
Do you believe bullying is a problem in your school?	n = 3,617	1,570	2,047
Yes, n (%)	1,946 (53.80%)	879 (55.99%)	1,067 (52.13%)
No, n (%)	1,671 (46.20%)	691 (44.01%)	980 (47.87%)
Do you believe self-harm is a problem in your school?	n = 3,617	1,570	2,047
Yes, n (%)	1,707 (47.19%)	669 (42.61%)	1,038 (50.71%)
No, n (%)	1,910 (52.81%)	901 (57.39%)	1,009 (49.29%)
Have you or someone you know ever thought about suicide? ¹	n = 3,576	1,545	2,031
Yes, n (%)	2,021 (56.52%)	740 (47.90%)	1,281 (63.07%)
No, n (%)	1,555 (43.48%)	805 (52.10%)	750 (36.93%)

¹Questions about suicide did not require a response, so 41 respondents included in the final analysis did not answer these questions.

Struggled with a mental health disorder	Substance Use			P-value ²
	Yes, n (%)	No, n (%)	Total	
Yes, n (%)	384 (54.16%)	890 (30.61%)	1,274 (35.22%)	<0.001
No, n (%)	325 (45.84%)	2,018 (69.39%)	2,343 (64.78%)	
Total	709 (19.60%)	2,908 (80.40%)	3,617	
Believe bullying is a problem in school				0.143
Yes, n (%)	364 (51.34%)	1,582 (54.40%)	1,946 (53.80%)	
No, n (%)	345 (48.66%)	1,326 (45.60%)	1,671 (46.20%)	
Believe self-harm is a problem in school				<0.001
Yes, n (%)	399 (56.28%)	1,308 (44.98%)	1,707 (47.19%)	
No, n (%)	310 (43.72%)	1,600 (55.02%)	1,910 (52.81%)	
Thought about or know someone who thought about suicide ¹				<0.001
Yes, n (%)	539 (78.46%)	1,482 (51.30%)	2,021 (56.52%)	
No, n (%)	148 (21.54%)	1,407 (48.70%)	1,555 (43.48%)	
Total	687 (19.21%)	2,889 (80.79%)	3,576	

²Pearson's chi-squared test was used to make comparisons.

Discussion

- Substance-using students reported a higher prevalence of mental illness and thoughts of suicide (or knowing someone who thought about it) compared to those who did not use substances.
- Substance-using respondents also demonstrated a higher prevalence of perceiving self-harm as a problem in their schools.
- These findings suggest potential value in screening young adolescents for both mental health issues and substance use.
- Future studies should explore the temporal relationship between substance use and mental health-related concerns to inform appropriate intervention.

Conclusions

- Mental health issues and substance use are prevalent among both middle and high school students with substance use initiation starting as early as elementary school.
- School-based programs can offer a platform to collect valuable insight into the mental health and substance use among adolescents, and guide targeted, early intervention efforts to prevent substance use and related harms.

Disclosures

Mr. Anthony Alvarado is the co-founder and former President of the Rise Together 501(c)(3). He delivered most of the RT speaking events in schools and was involved in survey design, survey administration, and data collection. Dr. Aleksandra Zgierska serves on the Board of Directors for the American Society of Addiction Medicine. Dr. Arjola Agolli's research work is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$473,925 with 15% financed by non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government. For more information, please visit HRSA.gov. The other authors have no relevant conflicts of interest to disclose.

