

# Effect of Mental Health Impairment and Sociodemographic Factors on Likelihood of Polysubstance Stimulant Use

Andy E. Kim, PharmD/MBA Candidate,<sup>1</sup> Na Young Kim, PharmD Candidate,<sup>1</sup> Sean H. Kim, PharmD, SM;<sup>1</sup>  
<sup>1</sup>Bernard J. Dunn School of Pharmacy, Shenandoah University, 1775 N. Sector Ct Winchester, Virginia

## INTRODUCTION

- Stimulants (cocaine, crack, methamphetamines, prescription stimulants) are a widely abused class of substance, with nearly 2.5 million Americans aged 12 or older had a stimulant use disorder in 2017.
- Despite the increasing national trend of stimulant use, there are limited studies on polysubstance stimulant use (PSU) in the US population.
- Although there are many studies that suggest an association between poor mental health outcomes versus polysubstance use of drugs, fewer studies have narrowed down the scope of analysis to PSU or "combination use" of stimulants.
- Fewer studies have elucidated the relationship between PSU versus mental health impairment, and PSU versus sociodemographic factors among adolescents and adults.

## OBJECTIVE

- This study assessed the size and direction of the association between PSU among adolescents and adults in the non-institutionalized US population with various degrees of mental health impairment and their sociodemographic factors.

## METHODS

- A cross-sectional study design was used to analyze the 2017 National Survey on Drug Use and Health (NSDUH) data, which measured prevalence of substance use and mental health issues among the non-institutionalized U.S. population aged 12 years or older.
- Respondents' mental health status was analyzed based on the World Health Organization Disability Assessment Scale (WHODAS) and their self-reported health.
- Seven sociodemographic covariates were assessed: age, sex, race, marital status, employment status, veteran status, and insurance status.
- Stata/SE 16's svy function was used to account for NSDUH's multi-stage, stratified sampling design.
- Chi-square test and multinomial logistic regression analyses examined the association between monosubstance stimulant use (MSU; reference group) and PSU I (two to three stimulant use) & II (four stimulant use) versus mental health impairment and sociodemographic factors.

## RESULTS

- Table 1 and 2 shows the distribution of the sample characteristics.
- The sociodemographic factors of being male gender, greater than 25 years old, unemployed, never been married in lifetime, and not having any forms of health insurance coverage increased likelihood of PSU in both levels (PSU I and PSU II). (Table 3)

### PSU I vs MSU

- As there is one additional disability in daily activities that results from mental health impairment, there was 7% increase in the risk of being a PSU I than those who used MSU. (Table 4)
- As there is one additional unit increase in respondents' self-reported health, there was 17% decrease in the risk of being a PSU I than those who used MSU. (Table 4)

### PSU II vs MSU

- As there is one additional disability in daily activities that results from mental health impairment, there was 21% increase in the risk of being a PSU II than those who used MSU. (Table 4)
- As there is one additional unit increase in respondents' self-reported health, there was 20% decrease in the risk of being a PSU II than those who used only MSU. (Table 4)

**Table 1.** Distribution of the Stimulant User Characteristics

Characteristics	% (SE)
Gender	
Female	40.4 (0.84)
Male	59.6 (0.84)
Age	
Adolescents & Young Adults (12-25 yo)	14.0 (0.45)
Full Adults (> 25 yo)	86.0 (0.45)
Race	
White Non-Hispanic	74.7 (0.64)
Black Non-Hispanic	7.4 (0.45)
Asian/Other Non-Hispanic	5.0 (0.30)
Hispanic	12.9 (0.57)
Employment Status	
Unemployed	7.2 (0.47)
Employed Part-time	17.4 (0.54)
Employed Full-time	75.4 (0.69)
Ever married in your lifetime?	
No	36.4 (0.74)
Yes	63.6 (0.74)
Ever served in the US military?	
No	90.8 (0.56)
Yes	9.2 (0.56)
No forms of health insurance in the past 12 months?	
No	92.2 (0.37)
Yes	7.8 (0.37)
Stimulant Use	
MSU	56.0 (0.72)
PSU I	40.7 (0.72)
PSU II	3.3 (0.22)

**Table 2.** Characteristics of Stimulant Users by Health Status

Characteristics	Mean (Std Dev)
Self-reported Health (Scale 1-5)	
MSU	3.67 (0.98)
PSU I	3.47 (0.99)
PSU II	3.30 (1.01)
World Health Organization Disability Assessment Schedule Total Score (WHODASC3)	
MSU	1.59 (2.50)
PSU I	2.03 (2.75)
PSU II	2.84 (3.04)

**Table 3.** Characteristics of Stimulant Users by Sociodemographic Factors (n = 8,486 unweighted estimate)

Variables	MSU % (SE)	PSU I % (SE)	PSU II % (SE)	P-value
Gender				<0.00001
Female	60.6 (1.0)	37.4 (1.0)	2.0 (0.3)	
Male	52.9 (1.0)	43.0 (1.1)	4.1 (0.3)	
Age				<0.00001
Adolescents & Young Adults (12-25 yo)	62.8 (1.1)	34.8 (1.0)	2.4 (0.32)	
Full Adults (>25 yo)	54.9 (0.82)	41.6 (0.81)	3.5 (0.26)	
Race				0.0004
White Non-Hispanic	55.2 (0.9)	41.0 (0.8)	3.8 (0.3)	
Black Non-Hispanic	51.1 (2.6)	47.5 (2.8)	1.4 (0.8)	
Asian/Other Non-Hispanic	58.7 (3.2)	37.9 (3.2)	3.5 (1.0)	
Hispanic	62.6 (2.1)	36.0 (2.0)	1.4 (0.4)	
Employment Status				0.02
Unemployed	49.3 (2.8)	44.2 (2.5)	6.5 (1.5)	
Employed Part-time	55.6 (2.5)	42.1 (2.5)	2.3 (0.5)	
Employed Full-time	55.9 (0.4)	40.7 (1.0)	3.4 (0.3)	
Ever married in your lifetime?				0.009
No	54.0 (1.0)	41.7 (0.9)	4.3 (0.5)	
Yes	57.1 (0.9)	40.2 (1.0)	2.7 (0.3)	
Ever served in the US military?				0.57
No	55.7 (0.8)	41.0 (0.7)	3.3 (0.2)	
Yes	58.1 (2.8)	38.0 (2.9)	3.8 (1.1)	
No forms of health insurance in the past 12 months?				0.0001
No	58.5 (0.9)	38.9 (0.9)	2.6 (0.2)	
Yes	50.3 (0.3)	43.1 (2.8)	6.6 (1.4)	

**Table 4.** Multinomial logistic regression of stimulant use (unweighted n=5,532): PSU I vs MSU and PSU II vs MSU (weighted risk ratio, 95% CI)

Characteristics	PSU I vs. MSU RR (95% CI)	PSU II vs. MSU RR (95% CI)
Gender		
Female	Reference	Reference
Male	1.45 (1.21, 1.74)*	3.04 (2.09, 4.43)*
Age		
Adolescents & Young Adults (12-25 yo)	Reference	Reference
Full Adults (>25 yo)	1.34 (1.16, 1.54)*	2.82 (1.67, 4.78)*
Race		
White Non-Hispanic	Reference	Reference
Black Non-Hispanic	1.11 (0.78, 1.58)	0.39 (0.08, 1.93)
Asian/Other Non-Hispanic	0.68 (0.48, 0.96)*	0.80 (0.33, 1.91)
Hispanic	0.86 (0.67, 1.11)	0.35 (0.14, 0.87)*
Employment Status		
Unemployed	Reference	Reference
Employed Part-time	1.10 (0.76, 1.57)	0.69 (0.29, 1.61)
Employed Full-time	1.03 (0.77, 1.37)	0.81 (0.45, 1.47)
Ever married in your lifetime?		
No	Reference	Reference
Yes	0.95 (0.79, 1.12)	0.56 (0.33, 0.95)*
Ever served in the US military?		
No	Reference	Reference
Yes	0.73 (0.52, 1.02)	1.08 (0.49, 2.39)
No forms of health insurance in the past 12 months?		
No	Reference	Reference
Yes	1.29 (1.02, 1.63)*	2.81 (1.56, 5.08)*
Self-reported Health	0.83 (0.76, 0.91)*	0.80 (0.64, 0.99)*
WHODASC3	1.07 (1.04, 1.11)*	1.21 (1.12, 1.29)*

\*p-value < 0.05

## STRENGTHS & LIMITATIONS

- Utilization of WHODAS to assess degrees of mental health impairment and its implications on the PSU is unprecedented.
- The extent of PSU was stratified into two levels (PSU I and PSU II) to determine the differentiated patterns of PSU.
- Our findings extend previous research studies that examined the association between PSU of drugs and mental health outcomes; the findings of this study is consistent with previous studies in terms of size and direction of the relationship.
- NSDUH dataset is a survey data taking a snapshot of a specific point in time (cross-sectional study design). Hence, temporal sequence in the order of events or predictor variable preceding outcome variable may not be guaranteed in our study.
- NSDUH uses self-reported data from respondents rather than clinician-reported health outcomes. Different forms of biases such as recall bias or bias that results from self-reporting could underreport or overreport our measures of association findings.
- There were no measurements of comorbid psychiatric conditions or other health conditions that may be associated with PSU, leaving the possibility of residual confounding effects that were unaccounted for.

## CONCLUSIONS

- Contrary to previous studies that looked at the relationship between polysubstance use of drugs on mental health impairment, this study examined the incremental effect of mental health impairment on PSU.
- Our study findings will be a stepping stone to identifying sociodemographic factors that are associated with polysubstance use of drugs, particularly with a narrowed specificity to stimulant misuse or abuse.
- Identification of relevant sociodemographic factors would enable policymakers to suggest an evidence-based policy intervention for PSU; healthcare providers who commonly prescribe stimulants should be aware of these research findings.
- A longitudinal study is warranted in the future looking at multiple time points to examine the causal association between mental health impairment and its effects on PSU.

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