

The Effect of Substance Use History on Nicotine Withdrawal Severity During Psychiatric Smoke-Free Hospitalization



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Background

Psychiatric institutions in the United States are increasingly implementing smoke-free policies with concurrent tobacco treatment services.

Nicotine withdrawal (NW) syndrome, a set of symptoms appearing within 24 hours of abstaining from or reducing a regular amount of tobacco use, is still an inadequately addressed issue.

NW is responsible for unsuccessful quit attempts among patients with mental illnesses (MI). Concurrent substance use in addition to a MI may worsen the experience of NW.

Objectives

Among patients with MI during a smoke-free hospitalization, this study aimed to (1) determine the severity of NW, based on the interaction between MI diagnoses and substance use history, and (2) to identify the factors associated with NW syndrome.

Method

A retrospective analysis of patient chart data from those admitted to a psychiatric institution in Kentucky from Jan to Dec 2016 was performed.

We employed two-way Analysis of Variance (ANOVA) to examine the interaction effect of psychiatric diagnoses categories and substance use history on NW.

In addition, we employed univariate and multivariate logistic regression analyses to identify the associative factors with NW syndrome diagnosis in our sample.

Variables demonstrating significant associative relationship with NW severity in the univariate analyses were included in the multivariate regression analysis model.

Results

Our two-way ANOVA analysis yielded no significant differences in NW severity based on the interaction between substance use history and psychiatric diagnoses categories (Table 1 and Figure 1). However, MI categories were responsible for higher NW severity, especially for patients with a current substance use disorder diagnosis (as indicated by a post hoc test, result not shown).

In each MI category, those with a substance use history had higher scores on NW severity as compared to those without a substance use history (Figure 1); however the main effect of substance use history on NW severity was insignificant ($p=.244$).

The multivariate regression model indicated higher odds for NW syndrome diagnosis during the first week after the smoke-free hospitalization (Table 2). Moreover, the amount of nicotine consumed per day showed high tendency towards predicting NW as well ($p=0.063$).

Table 1. Multifactorial Testing of the Interaction between Substance Use History and Diagnoses Categories on Nicotine Withdrawal Severity During A Psychiatric Smoke-Free Hospitalization (N = 246)*.

Factor 1	Discharge diagnoses Categories								p-Value
	Psychotic disorders		Mood and anxiety disorders		Substance use disorders		Other disorders		
	Substance Use History		Substance Use History		Substance Use History		Substance Use History		
	Yes n = 33 M ± SD	No n = 24 M ± SD	Yes n = 43 M ± SD	No n = 20 M ± SD	Yes n = 31 M ± SD	No n = 0 M ± SD	Yes n = 18 M ± SD	No n = 7 M ± SD	
MINWS ^a	2.5 ± 3.8	2.2 ± 2.6	4.1 ± 5.2	3.4 ± 3.6	4.1 ± 4.8	---	3.4 ± 4.4	2.3 ± 4.3	0.482 ^b 0.244 ^c 0.042 ^{d,*}

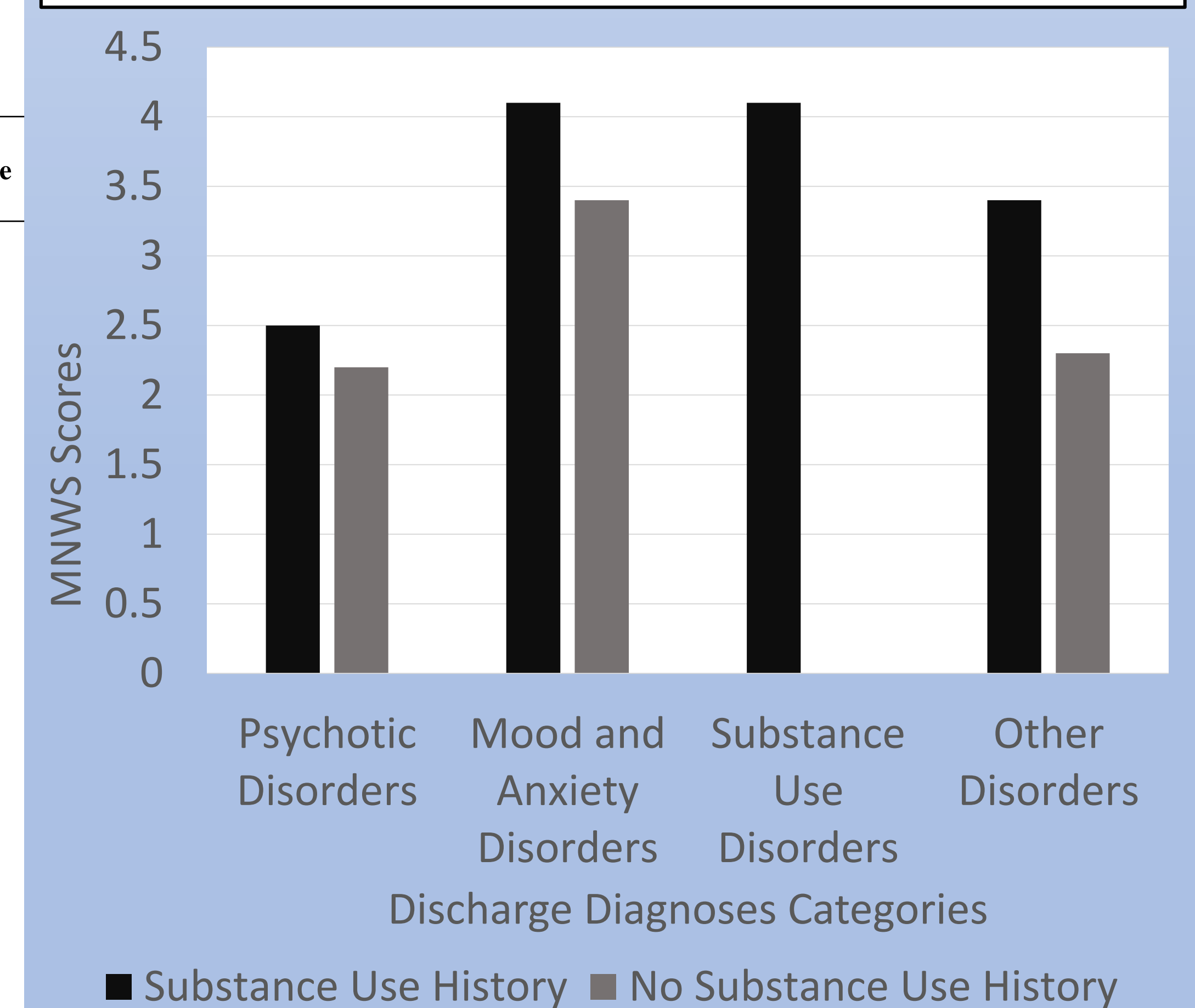
^a Dependent variable: The Minnesota Nicotine Withdrawal Scale scores. ^b Related to the interaction effect between the discharge diagnosis category and substance use history (yes vs. no). ^c Related to the main effect of substance use history. ^d Related to the main effect of the discharge diagnosis category. * Nine missing cases. ^e Includes personality/malingering, cognitive/traumatic brain injury, adjustment disorders, or altered mental status not otherwise specified) disorders. * significant at $\alpha = 0.05$. M: Mean. SD: Standard Deviation. Equal variances assumed by Levene's test $F(6, 239) = 0.356, p = 0.906$.

Table 2. Univariate analyses of covariates and A Multivariate Logistic Regression Analysis of Predictors of Nicotine Withdrawal Diagnosis During Psychiatric Smoke-Free Hospitalization (N = 255).

Covariates	Univariate Analyses (t-test/Mann-Whitney U or Chi-square/Fisher Exact test)		Multivariate Logistic Analysis ^a		
	95% CI or U or n (%)	P-Value	Odds ratio (OR)	95% CI	P-Value
Age (in years) ^d	-3.37-8.29	0.407	---	---	---
Gender ^e		0.378	---	---	---
Males	16 (11)				
Female	9 (8)				
Ethnicity ^f		0.087	---	---	---
Non-White	0 (0)				
White	25 (11)				
Education ^g		0.717	---	---	---
Less than high school	6 (9)				
GED	7 (9)				
Associate or higher degree	12 (12)				
Hospitalization period (in days) ^h	2129.5	0.033*	1.006	0.983-1.029	0.619
Number of prior hospitalizations ^h	2845	0.921	---	---	---
Tobacco use type ^f		0.736	---	---	---
Non-cigarettes	3 (11)				
Cigarettes	22 (10)				
Cigarettes Equivalents per Day (CPD) ^h	1963	0.006*	1.02	0.999-1.041	0.063
Time till assessment (in days) ^{h,*}	1785	0.002*	1.28	1.037-1.59	0.021*
Substance use history ^f		0.112	---	---	---
No	4 (5)				
Yes	21 (12)				
Substance use treatment ^e		0.222	---	---	---
No	15 (9)				
Yes	10 (14)				
Receiving NRT ^f		0.704	---	---	---
No	1 (5)				
Yes	24 (10)				
Psychiatric diagnosis at discharge ^e		0.557	---	---	---
Other Disorders	4 (11)				
Psychotic Disorders	7 (7)				
Mood and Anxiety Disorders	8 (10)				
Substance Use Disorders	6 (15)				

Dependent variable: Nicotine withdrawal diagnosis (i.e., have 4 or more NW symptoms). U: Mann-Whitney U statistic. ^d examined using t-test. ^e examined using Chi-square. ^f examined using Fisher Exact test. ^h examined using Mann-Whitney U test. * Has a median of 3. ^a Nagelkerke R square = 0.106 and Hosmer-Lemeshow goodness-of-fit P-value = 0.392. * Significant at $\alpha = 0.05$.

Figure 1. Two-way ANOVA of the interaction between substance use history and diagnoses categories on the severity of nicotine withdrawal during smoke-free psychiatric hospitalization.



Conclusion and Implication

Special attention to NW is required for patients admitted within smoke-free psychiatric institutions, especially for those with co-occurring substance use disorders. Future research should address whether different substance use disorders (i.e., alcohol use vs. opiate use, vs. marijuana) have different effects on NW severity.