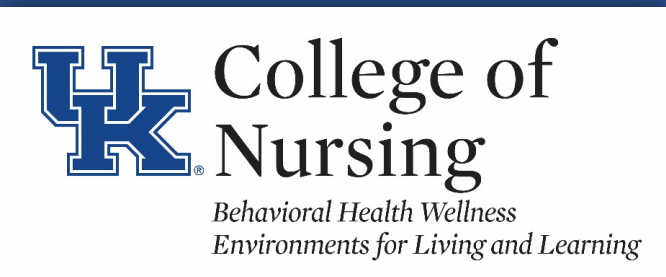


Psychometric Properties of the Minnesota Nicotine Withdrawal Scale in a Sample of Patients with Mental Illness



Yazan D. Al-Mrayat, PhD Candidate, MSN, RN¹, Chizimuzo T.C. Okoli, PhD, MPH, MSN, RN^{1,2}, Christina Studts, PhD, LCSW³, Mary K. Rayens, PhD¹, Ellen J. Hahn, PhD, RN, FAAN¹

¹College of Nursing, University of Kentucky; ²Eastern State Hospital, Lexington, KY; ³College of Public Health, University of Kentucky



Background

An estimated 21% to 59% of patients with mental illness (MI) are current tobacco users.

Around 65% of psychiatric inpatients experience moderate to severe nicotine withdrawal (NW) symptoms, a set of symptoms appearing within 24 hours after an abrupt cessation or reduction in the consumption of tobacco-containing products, for those using nicotine on daily basis for at least a couple of weeks.

The Minnesota Nicotine Withdrawal Scale (MNWS) is a widely used and validated instrument for detecting NW. However, the validity and reliability of the MNWS has not been previously examined among patients with MI in the context of hospitalization in a tobacco-free psychiatric institution.

Purpose

The purpose of this study was to examine the psychometric properties of the 8-item MNWS in a sample of patients with MI during a tobacco-free psychiatric hospitalization.

Method

Design

This study was a secondary analysis of data from a retrospective review of medical records from admissions to a state psychiatric facility in Kentucky between January 1st, 2016 and December 31st, 2016.

The MNWS is a self-report 8-item scale based on the diagnostics criteria for NW syndrome in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) (i.e., 4 or more of the following symptoms: anxiety, irritability/frustration/anger, difficulty concentrating, increased appetite, restlessness, depressed mood, and insomnia), in addition to craving.

Primary Outcomes

- Reliability was examined using both the Cronbach's alpha and item analysis.

- Validity was examined using exploratory factor analysis and testing the hypothesis that patients with higher amounts of daily nicotine consumption would also report higher NW severity after admission, using a multivariate linear regression model.

Results

Sample Characteristics

- Study sample (N = 255) consisted primarily of White Caucasian (89.4%) males (55.7%), with a mean age of 42 years (SD=14). On average, patients had a 16-day hospitalization period and a 3.2 (SD=4.2) score on the MNWS.

Reliability

- The reliability analysis yielded a Cronbach's alpha coefficient of 0.763 and item-total correlations between 0.291 and 0.691 (Table 1).

Validity

- Hypothesis testing confirmed that higher amounts of daily nicotine consumption were associated with greater NW severity after admission, supporting the construct validity of the MNWS. The exploratory factor analysis yielded a unidimensional scale, with the designated factor accounting for 49% of the total variance in the MNWS scores (Tables 2 & 3 and Figure 1).

Table 2. Summary of Multivariate Regression Model. (N=184)

Variable	B	β	Confidence Interval (CI)	P-Value
Cigarettes per day	0.008	0.004	(0.001-0.016)	0.025*
Receiving NRT				
No (reference)	---	---	---	---
Yes	0.258	0.218	(-0.173-0.689)	0.240
Race				
White (reference)	---	---	---	---
Non-White	0.741	0.205	(0.336-1.147)	<0.001*
Hospitalization period (in days)	-0.001	0.002	(-0.005-0.004)	0.697
Discharge diagnosis				
Other disorders (reference)	---	---	---	---
Depressive disorders	0.192	0.178	(-0.16-0.544)	0.283
Psychotic disorders	0.047	0.176	(-0.3-0.395)	0.788
Substance use disorders	0.186	0.205	(-0.22-0.591)	0.368

Dependent variable: Nicotine withdrawal severity, measured using the MNWS. β: Standardized coefficients. B: Unstandardized coefficients. Adjusted R²: 0.091. CPD: Cigarettes equivalents per day. * Significant at α = 0.05.

Table 3. Loadings of The MNWS Items in the Identified Factor

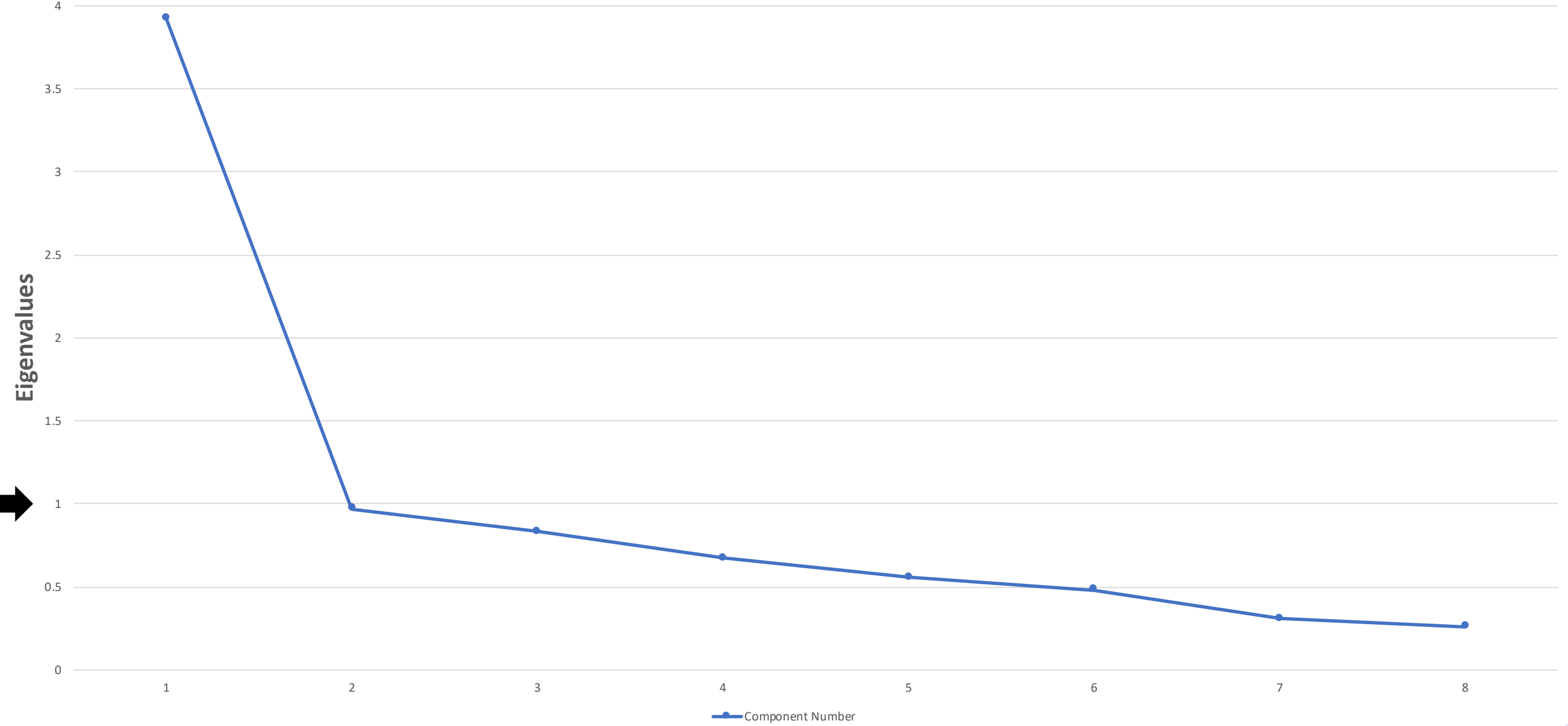
Item of the MNWS	Item Loadings on the Identified Factor
Restlessness	0.835
Anger/Frustration/Irritability	0.825
Anxiety	0.787
Difficulty Concentrating	0.754
Insomnia	0.740
Depressed Mood	0.678
Increased Appetite	0.452
Craving	0.377

Table 1. Item-Total and Interitem Correlations for the MNWS. (N=255)

MNWS Item	Corrected item-total correlation	Craving	Depressed mood	Insomnia	Anger/irritable/frustrated	Anxious	Difficulty concentrating	Restlessness	Increased appetite	Cronbach's alpha if item deleted
Craving	0.291	1.00								0.853
Depressed mood/sad	0.548	0.243	1.00							0.730
Insomnia/sleep problems/awakening at night	0.576	0.183*	0.423	1.00						0.732
Anger/irritable/frustrated	0.691	0.288	0.465	0.530	1.00					0.698
Anxious/nervous	0.636	0.223	0.527	0.438	0.717	1.00				0.711
Difficulty concentrating	0.589	0.177*	0.415	0.514	0.519	0.476	1.00			0.732
Restlessness	0.689	0.260	0.413	0.602	0.638	0.584	0.625	1.00		0.702
Increased appetite/hungry/weight gain	0.312	0.081*	0.264	0.292	0.229	0.210	0.330	0.350	1.00	0.761

* Less than 0.20. Cronbach's alpha = 0.763. Interitem correlations = 0.393.

Figure 1. A Scree Plot of The Eigenvalues of The MNWS Items.



Conclusion and Implications

The MNWS demonstrated adequately reliable and valid psychometric properties for measuring NW among patients with MI during tobacco-free psychiatric hospitalizations.

This instrument may be recommended in clinical practice to identify patients with high NW severity, in order to take necessary measures in managing withdrawal and enhancing comfort during a tobacco-free hospitalization.