

Examining Sociodemographic and Diagnostic Predictors of Columbia Suicide Severity Rating Scale (C-SSRS) Scores and Suicide Attempts Within Northwest Indiana Emergency Departments

Jayden Henneman, Jonathan Guerrero, Joshua Mangum, Baraka Muvuka, Kyle Gospodarek

Indiana University School of Medicine-Northwest

Background: Suicide is a public health crisis, ranked as the 11th leading cause of death in U.S. adults. Indiana suicide rates have surpassed the national average since 2000. Prior research indicates suicide risk factors vary between healthcare systems. This study examined whether analysis of sociodemographic and diagnostic predictors within emergency department (ED) data could provide more information about local suicide risk factors than the Columbia Suicide Severity Risk Scale (C-SSRS) scores alone.

Methods: Retrospective analysis of ED data from three urban hospitals in Northwest Indiana from January 2021 to March 2025 was conducted. Suicide attempts were identified via ICD-10. Suicide risk was modeled for sociodemographic factors using ordinal and binary logistic regression, with C-SSRS and suicide attempt as outcomes, respectively. Elastic net penalized logistic regression models were used to examine ICD-10 codes associated with suicide risk.

Results: The sample included 322,583 ED visits, with 1,674 (0.52%) visits involving high C-SSRS scores and 454 (0.14%) suicide attempts. Sociodemographic factors with higher suicide risk included age<18 (C-SSRS, suicide attempt models: OR=13.2, 11.8; p=0.017, <0.001), age 18-24 (OR=1.96, 3.31; p<0.001, <0.001), mental health diagnosis (OR=24.4, 15.7; p<0.001, <0.001), and family income <\$15,000 (C-SSRS model only, OR=3.37, p=0.045). ICD-10 codes most associated with high C-SSRS were severe major depressive disorder (MDD) with psychosis (OR=130.2); unspecified MDD (OR=73.9); and moderate MDD (OR=71.3). Suicide attempt was most associated with suicidal ideation (OR=71.9), accidental poisoning (OR=16.1), and cannabis dependence (OR=11.4). Notably, negative suicide attempt predictors included schizophrenia, unspecified (OR=0.22), and borderline personality disorder (BPD) (OR=0.23).

Conclusions: Consistent screening for social determinants of health may improve suicide risk identification. ED-based models can identify short-term risk factors for attempting suicide. Future research using diverse outpatient settings may provide more information on specific time scales for short- and long-term risk factors using models that can perform time-to-event analysis.