



## Predictive Analytics Use for Preventing Adolescent Substance Abuse and Nursing Implications: A Systematic Literature Review

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### INTRODUCTION

- Substance abuse in adolescents is a significant population health concern and a risk factor for other health problems and mortality in adolescents.
- Predictive analytics have served as a useful tool for healthcare decision-making, and the value of such a process is more recognized with emerging big data science.
- It is valuable to review significant predictors related to substance abuse in adolescents so that nurses can transfer the knowledge into actions for prevention and management of substance abuse and relevant health issues.

### PURPOSE

- This systematic literature review was conducted to identify what and how the predictive analytics were used to predict substance abuse or any health issues due to substance abuse in adolescents.

### METHODS

- The databases of CINAHL, PubMed, and Child Development & Adolescent Studies searched.
- Used Boolean operations and keywords: ['Substance use' OR 'Substance abuse'] AND ['adolescen\*' OR 'Teen\*' OR 'Youth\*'] AND ['nurs\*' OR 'health\*'] AND ['predict\*' OR 'forecast\*' OR 'modeling\*'].
- The search was limited to peer-reviewed articles published in English between 2012 and 2017.
- A total of 131 articles were found.
- After a quick view of the abstracts and an exclusion of the duplicates, 41 articles were reviewed and analyzed.



### RESULTS

- Common data sources were national data sets, such as the National Longitudinal Study of Adolescent Health, National Survey of Drug Use and Health, following by research data, school-level data, and state-level data.
- Sample size ranged from 154 to 126,764 participants.
- The major predictive analytic methods were logistic regression analysis, structural equation model, and latent growth curve modeling.
- Predictors identified range widely across the reviewed articles.
  - The common predictors for substance abuse were peer influence, including peer networks and peer substance use.
  - Early onset or prior experience with substance abuse significantly predicted later substance abuse.
  - Adults support also influenced substance abuse.
  - An interesting predictor found was cyberbullying.
- The common health issues related to substance abuse was mental health, including depression.

### DISCUSSION & CONCLUSION

- A multifactorial approach is essential for nurses working with adolescents who have or are at risk for substance abuse.
- With common predictors, nurses, educators and researchers could develop and implement targeted preventive and management strategies for adolescent substance abuse programs.
- It is important for nurses to assess adolescents with regard to their network of social interactions and engagements. Health education should be directed not only to adolescents but also to their peer groups and other significant relations. As social media use becomes more prevalent in adolescents, the assessment and interventions with peer networks using social media will be a promising strategy.
- This review found the importance of assessment and invention of substance use and relevant mental health issues in the early adolescence to prevent sustained or worsen substance abuse in later adolescence or young adulthood.
- This literature review identified a lack of nursing-focused studies in relation to predictive analytics and substance abuse in adolescents. It is recommended for the nurse profession to explore predictive analytics to prevent or intervene substance use-related health issues in adolescents.