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Research Brief

# Teaching Neonatal Abstinence Syndrome Using Simulation

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## KEYWORDS

neonatal abstinence  
syndrome;  
simulation;  
evaluation

## Abstract

**Background:** The National Survey on Drug Use and Health reported that the rate of illicit drug use among pregnant women ranged from 3.2% to 14.6%. Maternal drug use during pregnancy may result in neonatal abstinence syndrome (NAS). This study explored whether simulation training is more effective than traditional didactic and video instruction in teaching nursing students' assessment skills for scoring NAS. **Methods:** Twenty-six nursing students participated in this randomized intervention study that incorporated simulation scenarios. The simulation/experimental group received a lecture/video and hands-on training using a high-fidelity simulation manikin. The didactic/control group received lecture/video training only. Both groups were asked to score the infant's withdrawal symptoms using the NAS scoring system. The student scores were compared with the nurse expert rater NAS scores.

**Results:** An independent sample *t*-test was conducted to compare the tendency score, dangerous score, and overall discrepancy score between the experimental group and the control group. There were no significant differences in NAS scores between the experimental group and the control group. However, the overall discrepancy scores were lower among the experimental group indicating that the experimental group scored closer to the nurse expert.

**Conclusion:** The findings will be used to develop an evidence-based clinical experience using high-fidelity simulation training to enhance patient safety.

## Cite this article:

Labant, A. L., & Palmer, E. A. (2017, June). Teaching neonatal abstinence syndrome using simulation. *Clinical Simulation in Nursing*, 13(6), 254-257. <http://dx.doi.org/10.1016/j.ecns.2017.01.009>.

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## Background

In the United States, illicit drug use among pregnant women is a public health issue. The *National Survey on Drug Use and Health: Summary of National Findings* reported that the rate of current illicit drug use in the combined 2012 to 2013 data was 14.6% among pregnant women aged 15 to

17 years, 8.6% among women aged 18 to 25 years, and 3.2% among pregnant women aged 26 to 44 years (U.S. Department of Health and Human Services, 2013). Maternal drug use during pregnancy may result in neonatal withdrawal. The clinical findings associated with opioid withdrawal have been termed the neonatal abstinence syndrome (NAS) (Hudak & Tan, 2012). The most common drugs associated with NAS are methadone, heroin, and narcotics. According to the Centers for Disease Control and Prevention, the incidence of NAS has increased 300%

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from 1999 to 2013 (Ko et al., 2016). The signs and symptoms worsen as the drug levels decrease and are seen as a generalized disorder that includes central nervous system, metabolic, vasomotor, respiratory, and gastrointestinal disturbances. Most infants develop signs and symptoms of

withdrawal one to five days after birth (Hudak & Tan, 2012). Nursing students care for NAS infants during their clinical rotation in maternal–neonatal and pediatric clinical courses and need to work closely with the health care team in accurately assessing the signs and symptoms of neonatal withdrawal in order to initiate appropriate nursing interventions.

To help build assessment skills, nursing programs are using simulation as a pedagogical approach to improve student learning. This study implemented aspects of the Department of Nursing and Allied Health Simulation Model that incorporates domains of new knowledge, patient care, psychomotor tasks, and practice-based learning. This model is based on an adaptation of a model in Huang et al. (2012) currently in use in

medical schools. The model also incorporates other domains including interpersonal communication skills, professionalism, leadership, team training, and critical thinking/decision making. This model helps guide simulation development, teaching–learning practices, and evaluation of student learning.

High-fidelity simulation manikins are designed to represent a person and are able to reproduce human physiology through customized programming (Cant & Cooper, 2010; Harder, 2010; McGovern, Lapum, Clune, & Martin, 2013; Waxman, 2010). Students who will encounter NAS on the clinical unit need opportunities to practice the necessary skills in order to perform safely in practice. Simulation allows students to practice, apply knowledge, and then utilize this in the real clinical setting (Jeffries, 2012). The framework used for our study highlights five components: (a) educational practices, (b) teacher factors, (c) student factors, (d) design characteristics (e.g., objectives, complexity, fidelity), and (e) outcomes (e.g., skill performance) (Jeffries, 2007, 2012). This research study sought

to explore the effect of simulation (educational practices) on student learning (outcomes).

Currently, there are no NAS simulation studies with student nurses reported in the literature. This research study enabled the researchers to develop a coordinated simulation intervention to enhance assessment skills and safety during the neonatal period when student nurses are caring for infants who are withdrawing from opioids. The purpose of this study was to determine whether simulation training is more effective than traditional didactic instruction in teaching nursing students assessment skills for identification of neonatal abstinence syndrome. The primary aim of the study was to evaluate the effects of simulation skill training for neonatal abstinence syndrome. The researchers' hypothesis was student nurses using simulation will demonstrate improved (or more accurate) neonatal abstinence syndrome assessment skills following hands-on training using a SimNewB than the students who receive the regular curriculum education training, without simulation activity.

## Sample and Methods

This was a randomized intervention study for teaching NAS assessment skills. Following institutional review board approval, a volunteer sample of junior-level nursing students enrolled in NURS 333 Maternal–Neonate Clinical were invited to participate in the study and completed consent forms. There were no exclusion criteria.

Fourteen students were randomly assigned to the experimental group and 12 to the control group. Both groups received 60-minute instruction on NAS and how to use the neonatal abstinence scoring system. An adapted Finnegan neonatal abstinence scoring system was used for this study (Victoria State Government, 2013). The NAS scoring system has been developed as both a clinical and investigative tool. The addicted infant is given a total score following an assessment of the central nervous system, gastrointestinal track, and other systems such as sweating and fever. The NAS scoring system provides basic, uniform criteria for assessment and treatment of the newborn, that is, born with a mother who used illicit drugs during her pregnancy.

The simulation/experimental group received lecture/video and hands-on training using SimNewB. The didactic/control group received lecture/video training. Following the training instruction, both groups received an NAS scenario developed by the researchers based on sentinel events, an NAS video of an infant showing withdrawal symptoms, and SimNewB that displayed withdrawal symptoms. The participants were asked to score the infant's withdrawal symptoms using the NAS scoring system. A nurse expert who cares for NAS infants was used as a consultant and independently scored the withdrawal symptoms displayed by the video and SimNewB. The students' scores were compared with the nurse expert rater NAS scores.

### Key Points

- The literature is lacking on evidence based teaching methods for student nurses seeking to improve their ability to assess infants experiencing Neonatal Abstinence Syndrome.
- This simulation intervention allowed student nurses to score infants on the neonatal abstinence scoring tool closer to the nurse expert ratings.
- The findings of this study have enabled the researchers to incorporate this high fidelity simulation training into the undergraduate nursing curriculum.

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