

## ORIGINAL RESEARCH

# Opioid use disorder education for undergraduate baccalaureate nursing students

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## ABSTRACT

**Background and objective:** A dramatic increase in the misuse of opioids has elevated Opioid Use Disorder (OUD) to a national health crisis. Healthcare providers must be confident and knowledgeable to provide care for patients with OUD. The current study measured the effectiveness of OUD education for Baccalaureate (BSN) nursing students.

**Methods:** Seventy-six (76) students participated. Instruments measured demographic characteristics, knowledge of OUD, and confidence and attitudes when providing care for OUD clients.

**Results:** There was a significant increase in OUD knowledge and improvement in confidence and attitudes toward OUD clients from baseline to two weeks.

**Conclusion:** Results support that a hands-on OUD educational session can increase OUD knowledge, improve attitudes toward treating OUD clients, and increase confidence in nursing students when caring for OUD clients.

**Key Words:** Nursing students, Naloxone training, Opioid use disorder, Opioid education

## 1. INTRODUCTION

Opioid Use Disorder (OUD) is a global health concern affecting 35.8 million people worldwide.<sup>[1]</sup> Over the last three decades, the United States (US) has experienced a rise in the misuse of opioids and the incidence of opioid overdoses, elevating OUD to the status of a national health crisis.<sup>[2]</sup> The misuse of opioids has significantly increased the risk of overdose.<sup>[2]</sup> Though the US makes up only four percent of the world's population, it claims 27% of the world's drug overdose mortality rates.<sup>[3]</sup> In fact, between 2010 and 2018, the rate of overdose deaths for US citizens increased by 120%, accounting for two-thirds of the world's overdose mortality rate.<sup>[1]</sup> In 2020, the CDC reported drug overdose as the number one cause of injury-related deaths in the United States.<sup>[2]</sup>

Being knowledgeable about opioids and the risk of over-

dose is crucial for preventing opioid overdose deaths. An effective intervention for OUD is naloxone (Narcan) administration. Naloxone, an opioid antagonist, works rapidly to restore respiratory function for someone whose overdose is related to opioids.<sup>[4]</sup> Naloxone works by attaching to the opioid receptors, blocking and reversing the effects of opioids. Because of its rapid reversal effects, naloxone has been effective at decreasing mortality rates associated with opioid overdose. Studies have shown a decrease in overdose deaths with the availability of naloxone in combination with community education regarding the appropriate administration of naloxone.<sup>[4,5]</sup> In response to the ever-increasing rates of opioid overdoses, naloxone is readily available in pharmacies without a prescription, opioid overdose prevention requires that healthcare providers have adequate knowledge about the

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risks of opioid overdose.<sup>[5]</sup>

The lack of proper education and reluctance to treat OUD accounts for some opioid overdose deaths.<sup>[2]</sup> The reluctance to treat OUD patients is apparent across all levels of providers, despite education or discipline. Lack of OUD knowledge is a significant barrier cited by many healthcare providers.<sup>[2]</sup> Federal regulations and training modules equip providers to address the needs of the OUD community but have not impacted opioid overdose prevention as first envisioned. Many providers are reluctant to treat OUD and overdose due to a lack of knowledge on how to care for OUD clients. In a multidisciplinary study, Williamson et al. revealed significant OUD knowledge gaps in physicians, nurse practitioners, physicians' assistants, and nurses. Pre-test scores showed profound, persistent gaps in OUD treatment knowledge and low confidence in abilities to incorporate patient treatment for all disciplines, suggesting OUD knowledge is deficient in all practice levels.<sup>[6]</sup> Meadows et al. explored nursing students' knowledge and attitudes toward the opioid epidemic.<sup>[7]</sup> The participants were in varying stages of their nursing education. The authors found that the progression of the nursing school curricula and clinical experiences increased knowledge of and improved attitudes toward those with OUD which suggests that exposure to OUD content may increase a willingness to care for those with OUD.<sup>[7]</sup>

A systematic review by Bernier and Barroso cited discriminatory nursing care towards OUD results from a lack of understanding and insufficient knowledge to care for these patients.<sup>[8]</sup> One researcher reported that even mental health nurses did not feel competent in treating patients with substance use disorders.<sup>[9]</sup> In the same study, the author noted that nurses lacked empathy and devalued the hardship of substance recovery compared to physicians.<sup>[9]</sup> Shreffler et al. suggests inadequate exposure to and instruction about OUD in nursing school may be a contributing factor for the nurses' attitudes towards OUD care.<sup>[10]</sup> Conversely, another study found that OUD patients did not trust nurses involved in their care citing they felt the nurse was not adequately trained on substance abuse disorders.<sup>[11]</sup> Distrust between the patient and the nurse damages the therapeutic relationship and affects patient outcomes.

Stigma and bias among healthcare providers are additional barriers affecting access to care. The concepts of stigma and bias are common across all healthcare disciplines and negatively impact outcomes for those with OUD. El Rasheed et al. suggested the lack of uncertainty about competency can trigger an emotional response in nurses. This response ultimately increases bias and stigmatization towards patients with substance disorders and negatively affects quality of care.<sup>[9]</sup> A

study conducted with first-year nursing students assessing their knowledge and perceptions about OUD and OD found a significant increase in post-test knowledge, which also correlated with decreased perceptions of stigma after completing an interactive presentation on addiction.<sup>[12]</sup> This study proposed that exposure to OUD content can positively impact perceptions and decrease bias toward caring for patients with OUD. The researchers also reported the participants acknowledged the significance of the epidemic and their role as future providers.<sup>[12]</sup>

Bernier and Barroso reported a common theme for improving quality OUD care. Multiple studies in this review suggested improvements in care will result from adequate educational preparation of all nurses.<sup>[8]</sup> Studies by Costello et al. and Meadows et al. also support the hypothesis that exposure to OUD content increases OUD knowledge and willingness to care for patients with OUD.<sup>[7,13]</sup> However, the nursing curriculum does not educate students about OUD effects.<sup>[14]</sup> Aronowitz et al. urged nursing educators to address the gap in healthcare curricula focusing on opioid/substance use disorder and chronic pain management.<sup>[14]</sup> The researchers suggest the lack of educational opportunities for OUD management has led to unpreparedness and, ultimately, an unwillingness to address the opioid crisis. The authors report only one percent of nursing programs in the US dedicate curriculum hours focused on chronic pain management or have limited substance abuse content.<sup>[14]</sup> Bernier and Barroso and Neville and Foley charged nursing schools to include curricula that emphasizes OUD as a disease to better prepare the future workforce to battle the opioid epidemic. The authors suggest expanding OUD content in the classroom and providing OUD experiences in the clinical setting will improve nursing care approaches to OUD.<sup>[8,15]</sup> Collectively, these studies support that providing non-biased, non-judgmental, and empathetic care is essential but requires sufficient knowledge of the condition. By increasing knowledge of OUD, nurses will be able to change perspectives on OUD care.

The nursing profession is the largest group of healthcare providers in the United States, which positions them to be a powerful player in addressing the opioid crisis.<sup>[16]</sup> Nurses are equipped to provide treatment for overdose and educate others on the prevention of overdose. However, an unwillingness, stigma, or lack of preparation, in combination with knowledge deficits about OUD, chronic pain management, and overdose treatment, may impede nurses from caring for those suffering from OUD. Registered nurses (RNs) are excellent patient advocates and are positioned to provide comprehensive quality care for those suffering from OUD, which is crucial for the successful containment of overdose-related deaths. RNs are essential resources for preventing opioid

overdoses, empowering them with knowledge about OUD will aid in the removal of existing barriers to treatment.<sup>[14]</sup>

This research study seeks to answer the following questions:

- 1) Does OUD and naloxone training increase nursing students' knowledge of OUD?
- 2) Does OUD and naloxone training increase nursing students' attitudes and confidence in caring for patients with OUD?

Research hypotheses:

- 1) OUD and naloxone training will increase nursing students' knowledge of OUD.
- 2) OUD and naloxone training will increase nursing students' attitudes and confidence in caring for patients with OUD.

## 2. METHODS

### 2.1 Research design

This descriptive study utilized a pre- and post-test design to evaluate the effectiveness of opioid education and naloxone training for nursing students, addressing a critical gap in their education and preparing them for future healthcare roles. An additional aim focused on the development of an academic intervention that would be easily replicable and applicable to other undergraduate BSN nursing students with hopes of increasing confidence in caring for patients with OUD and opioid overdose.

### 2.2 Sample, sample procedures, and setting

The study setting was a school of nursing located within a liberal arts university in the southeastern United States. The total number of students in the school of nursing is approximately 300. Recruitment occurred using convenience sampling of second-semester, junior-level nursing students and took place in September 2023 and again in February 2024. All second-semester, junior-level undergraduate nursing students were required to complete the specified training module and in-person simulation as part of their coursework. However, students were not required to complete the pre-/post-test, pre-/post-module questionnaire, or the demographic survey. Those students who chose to participate and complete the questionnaires were included in the study. The main criterion for inclusion was that participants should be second-semester junior BSN students. The participants had to be able to speak and understand English. No participants required assistance completing the surveys because of reading or visual difficulties. There were no exclusion criteria. A total of 100 students attended the educational sessions and 90 consented to participate in the study. Using the G\*Power 3.1 software, a sample size of 54 was needed to obtain a moderate effect size of .05.

### 2.3 Instruments

Three instruments were used in this study. A demographic survey, baseline Brief Opioid Overdose Knowledge (BOOK) and The Drug and Drug Users' Problems Perception Questionnaire (DDPPQ) scores were collected prior to OUD training. Two weeks after OUD and naloxone training, students were readministered the BOOK and DDPPQ. The total time required to administer all questionnaires was 30 minutes.

#### 2.3.1 BOOK tool

Knowledge of OUD, overdose, and overdose response was assessed using the 12-item, true-false, BOOK assessment tool developed by Dunn et al. (2016).<sup>[17]</sup> The BOOK was developed as a modified version of the Opioid Overdose Knowledge Scale (OOKS) Assessment tool. Reliability studies for the OOKS assessment show strong reliability with a Cronbach alpha of 0.83. The BOOK tool was originally developed to comprehensively measure opioid overdose risk knowledge of patients who use illicit or prescribed opioids.<sup>[18]</sup> Hines et al.<sup>[19]</sup> was first to use the BOOK tool to assess opioid overdose risk knowledge in undergraduate baccalaureate nursing students pre- and post-intervention.

Total BOOK scoring ranges from 0 to 12, with higher scores indicating greater opioid knowledge. Correct answers receive a score of "1" and incorrect answers receive a score of "0". Three subscales are measured by the BOOK assessment tool: opioid knowledge, opioid overdose knowledge, and opioid overdose response knowledge. Questions 1 through 4 measure opioid knowledge, questions 5 through 8 measure opioid overdose knowledge, and questions 9 through 12 assess opioid overdose response. Subscale scores are the number of correct answers within each subscale and have a range of potential scores from 0 to 4 for each item.

#### 2.3.2 DDPPQ tool

Measurement of attitudes toward and confidence in providing care for someone with OUD was measured using The Drug and Drug Users' Problems Perception Questionnaire (DDPPQ). The DDPPQ is a modified version of the Alcohol and Alcohol Problems Perception Questionnaire (AAPPQ) and was developed to examine healthcare providers' attitudes and perceptions toward individuals who use drugs.<sup>[20,21]</sup> The 22-item questionnaire uses a 7-point Likert scale ranging from 1 (strongly agree) to 7 (strongly disagree). The tool is divided into five subscales: role adequacy (having the adequate skills and knowledge to work with patients who use drugs), role legitimacy (having the right to work with patients who use drugs), role support (feeling supported in their work with patients who use drugs) role-related self-esteem (self-esteem while performing specified tasks for those who use drugs) and job satisfaction (expectations of satisfaction while

working with patients who use drugs). Of the 22 statements, seven (1-7) evaluate role adequacy, six (15-19, 22) measure role-related self-esteem, three (11-13) evaluate role support, three (14, 20-21) evaluate work satisfaction, and three (8-10) measure role legitimacy. Mahmoud et al. (2017)<sup>[21]</sup> found the DDPPQ instrument to be reliable ( $\alpha = .880$ ).

### 2.3.3 Demographic survey

Sociodemographic data was collected using a form created by the primary researcher and included age, gender at birth, ethnicity, place of birth, and parental income. The tool also included personal experience and the extent of personal experience with OUD/overdose. Sociodemographic data was obtained to determine if these variables influenced students' knowledge, confidence, or attitudes in treating OUD.

### 2.3.4 Training modules

The OUD training was provided in one session during the participants' required community nursing class. The training occurred in person and consisted of a PowerPoint-based lecture adapted from the Substance Abuse and Mental Health Services Administration (SAMHSA) Opioid Overdose Prevention Toolkit (OOPT)<sup>[22]</sup> followed by face-to-face group discussions and hands-on naloxone training. The OOPT was developed by the Association of State and Territorial Health Officials for first responders, healthcare providers, patients, and family members. Students were allotted 75 minutes to complete the self-study power point module and were encouraged to ask questions and have discussion if needed during completion. Naloxone training was conducted by a certified naloxone trainer employed by the university's student wellness center. The trainer provided a 30-minute in-person class on naloxone administration with an additional 50 minutes of hands-on training where the students could practice naloxone administration on a manikin before completing a skills check-off.

### 2.4 Ethical considerations

Consent and approval of the University's Institutional Review Board (IRB) was obtained before presenting the opportunity to students. Students were notified that participation was voluntary and all data collected would be kept anonymous and confidential. Prior to the scheduled educational session, the study procedures were explained, and informed consent was obtained from students who chose to participate.

### 2.5 Data collection

Once informed consent was obtained, participants were provided a secure survey link using Qualtrics.com. Each participant was given a unique identification number to be used for the pre- and post- surveys to protect participant identity and ensure the pre and post results could be linked for statis-

tical analysis. Data was downloaded in aggregate form to a spreadsheet and securely stored on the primary investigator's password-protected computer. Informed consents containing identifying information were stored separately under lock and key at the principal investigator's office.

### 2.6 Data analysis

Data analysis began with an examination of missing data and standard data cleaning. All interval/ratio variables were assessed for normality and measures of central tendency. Correlations were analyzed for all study variables, and no multicollinearity was found.

A total of 90 students attended the educational sessions. Of the 90 participants, 10 were eliminated due to greater than 20% missing data on the post-module test and/or survey. An additional 4 participants were removed due to being greater than three standard deviations below the mean scores for the BOOK test, leaving 76 participants included in the study. All 76 participants demonstrated 100% competency on naloxone administration prior to completing post training BOOK and DDPPQ tools.

The data collected pre- and post-modules were normally distributed for the BOOK test; therefore, parametric testing was used. Paired dependent sample *t*-tests were performed on BOOK subcategories of OUD knowledge, overdose knowledge, overdose response knowledge, and total BOOK scores both pre- and post-test for all participants.

The data collected pre- and post-modules for the DDPPQ was not normally distributed; thus, nonparametric testing was used. The Wilcoxon Signed-Ranks test was performed on DDPPQ subcategories of role adequacy, role legitimacy, role support, role-related self-esteem, and job satisfaction, as well as individual DDPPQ statements for both pre- and post-modules. Reliability testing was performed on the instruments used in this study, and correlational studies were performed to determine the relationship between ethnicity, parental income, place of birth, and OUD experience.

## 3. RESULTS

### 3.1 Participant characteristics

As shown in Table 1, the mean age of participants was 20.6 (SD = 1.6) years with a range of 19-33 years. Most participants were female (93.5%), non-Hispanic, Caucasian (93.5%), and live in the Atlanta Metro area (31.2%). More than 36.4% of the participants reported an annual family income between \$100,000 and \$200,000.

Table 2 summarizes the OUD demographics of participants. The majority (67.1%) reported no personal experience with

ODU. However, 30.3% (23) of participants reported associated experience with OUD with 100% of the 23 participants reporting they were close to someone who had experienced OUD. Of the 23 participants, ten (43.5%) reported they were close to someone who died from OUD or an overdose and six (26.1%) reported witnessing an opioid overdose.

**Table 1.** Sample characteristics

Characteristic	$\bar{x}$ (SD)	Range
Age (years)	20.6	19-33
Characteristic	n	%
Gender		
Male	4	5.2
Female	72	93.5
Ethnicity		
African American	2	2.6
Hispanic/Latin American	1	1.3
Caucasian (Non-Hispanic)	72	93.5
Asian/Pacific Islander	1	1.3
Hometown		
North Georgia	14	18.2
Atlanta Metro	24	31.2
Central Georgia	19	24.7
South Georgia	14	18.2
Coastal Georgia	1	1.3
Another State	4	5.2
Household Income		
< \$50,000	4	5.2
\$50,000-\$100,000	7	9.1
\$100,000-\$200,000	28	36.4
\$200,000-\$400,000	12	15.6
< \$400,000	3	3.9
I don't know	18	23.4
Prefer not to answer	4	5.2

Notes. n = 76

**Table 2.** OUD Demographics

Variable	N	%
Personal experience with OUD or opioid overdose		
No	51	67.1
Yes	23	30.3
Prefer not to answer	2	2.6
If previous experience with OUD/overdose, then:		
Currently suffer from OUD	0	0
In recovery from OUD	0	0
Survived an OUD overdose	0	0
Close to someone who has/had OUD	23	100
Close to someone who died from OUD or opioid overdose	10	43.5

**3.2 BOOK tool results: Knowledge**

Table 3 provides the results of the paired sample *t*-tests examining differences between scores on the BOOK and DDPPQ tools pre- and post-educational sessions. The hypothesis for research question 1 was supported. The mean knowledge score was 9.93 (SD = 1.4) at baseline which indicates a low to moderate knowledge level of OUD. The mean score at two weeks post-education was 11.12 (SD = 1.03) indicating a significant increase in OUD knowledge from baseline to two weeks.

**3.3 DDPPQ tool results: Attitudes and confidence**

In Table 4 the results of the Wilcoxon Signed Ranks test examining students' feelings of satisfaction and competence in treating OUD are reported. Data revealed statistically significant increases in 16 of the 22 items. The subcategories analysis revealed a significant improvement in Role Adequacy ( $z = -5.37, p < .001$ ), Role Legitimacy ( $z = -5.24, p < .001$ ), Role-Related Self-Esteem ( $z = -5.02, p < .001$ ), and Job Satisfaction ( $z = -3.78, p < .001$ ), but failed to show improvement in the subcategory of Role Support. Results support the premise that training on OUD and naloxone administration can improve the overall confidence of undergraduate nursing students.

**Table 3.** Dependent samples *t*-test for OUD, overdose, and overdose response knowledge

Variable	$\bar{x}$ (SD)	Possible Range	Actual Range	<i>p</i>
BOOK total score pre-intervention	9.93 (1.4)	0-12	7-12	.001*
BOOK total score post-intervention	11.12 (1.03)	0-12	8-12	
OUD knowledge pre-intervention	2.82 (.86)	0-4	2-4	.001*
OUD knowledge post-intervention	3.70 (.46)	0-4	3-4	
Overdose knowledge pre-intervention	3.64 (.58)	0-4	2-4	.070
Overdose knowledge post-intervention	3.79 (.41)	0-4	2-4	
Overdose response knowledge pre-intervention	3.47 (.66)	0-4	2-4	.001*
Overdose response knowledge post-intervention	4 (0)	0-4	4	

\*  $p < .001$

**Table 4.** Wilcoxon Signed-Ranks test for examining students’ feelings of satisfaction and competence in treating OUD

Variable	$\bar{x}$ (SD)	Possible Range	Actual Range	<i>p</i>
Role Adequacy	9.93 (1.4)	0-12	7-12	.001*
Role Legitimacy	11.12 (1.03)	0-12	8-12	.001*
Role Self-Esteem	3.70 (0.46)	0-4	3-4	.001*
Job Satisfaction	3.64 (0.58)	0-4	2-4	.001*
Role Support	2.82 (0.86)	0-4	2-4	.877

\**p* < .001

**3.4 Correlational studies**

A correlation analysis was calculated to determine if a relationship exists between ethnicity, parental income, place of birth, and OUD experience. A Pearson’s correlational study was performed, but data analysis indicated no correlation between these variables.

**4. DISCUSSION**

Previous authors have demonstrated that participation in a single, brief educational intervention increased participants’ OUD knowledge from baseline.<sup>[23–27]</sup> The current study established an increase in OUD knowledge from baseline to two weeks following a single, face-to-face educational session. Previous studies have utilized similar interventions, resulting in increased OUD knowledge from baseline to immediately following intervention, one month, and three months.<sup>[18]</sup> The current study reveals increased knowledge from baseline to two weeks following a single, brief, hands-on OUD training session. The current study adds to previous research, indicating a single, face-to-face, hands-on OUD training session is beneficial in increasing OUD and overdose knowledge among second-semester, junior-level BSN students.

The results of this study indicate that OUD training can significantly increase overall opioid and OUD response knowledge. Total BOOK scores and subcategory scores showed statistically significant increases. These findings are encouraging, considering the breadth of the opioid abuse epidemic. Equipping nursing students with increased knowledge and awareness regarding OUD occurrence, management, and implications may contribute to minimizing the OUD crisis.

The current study findings show significant increases in OUD knowledge and response actions. Students in this study now have the tools to act as first responders in an OD situation. They can be added to the corps of healthcare professionals who can potentially identify and manage an opioid OD crisis. Recognition of a crisis and response time are crucial.

The most significant and promising results were related to the improvement of participants’ attitudes and confidence in

treating OUD. The increase in the participant’s perceptions of role adequacy, role legitimacy, and self-esteem was all affected favorably. These positive findings further encourage the researchers and provide added confidence in the benefits of the study’s OUD training. In addition, OUD outcomes may be favorably improved as the healthcare workforce increases the number of persons trained in OUD recognition and management.<sup>[9]</sup>

**4.1 Strengths**

Results from this study are encouraging. Prior to the training module, participants had a low to moderate knowledge of OUD but did not express feelings of competence or satisfaction when working with patients with OUD. After completing the training, participants reported increased knowledge and increased feelings of competency and satisfaction. The study results support the premise that OUD education is crucial in preparing future nurses to care for patients with OUD. Increased competency will increase nurses’ willingness to work with patients with OUD and ultimately assist in controlling the OUD epidemic.

**4.2 Limitations**

There are some limitations to this study that should be considered. The participants were selected through convenience sampling. Results reflect attitudes of the study participants and not necessarily attitudes of the general population of second semester BSN students. The original sample size of 90 dropped by 15% percent to 76 participants, and 93.5% of the participants were non-Hispanic, Caucasian females. The reduced sample size and high percentage of participants in these demographic categories led to results for limited diversity of the study participants. A more diverse sample could yield significantly different findings.

The resolution of the OUD epidemic is at the forefront of political debates and national issues. Daily media coverage about OUD could have overexposed participants and influenced perceptions and knowledge of OUD, however, the accuracy of social media content cannot be validated. Additionally, knowledge gathered from sources other than

formal education may be influenced or biased by third party stakeholders. Though it may be meaningful to address participants' media exposure in a future study, overexposure of unvalidated content cannot prepare nurses to treat OUD with competency. Therefore, educational opportunities must be intentional to address the OUD knowledge gap that exists in formal nursing education.

## 5. CONCLUSIONS

The importance of this study cannot be overstated. Most of this study population declared no personal experience with OUD (67.1%). Over 30% of participants reported knowing someone affected by OUD with 43.5% (n = 10) of them knowing someone who had experienced death related to OUD. Though the media has been saturated with information about OUD and OD prevention, knowledge obtained via social media does not constitute competency. The content acquired through means other than dedicated educational instruction may lack accuracy and applicability in the health care setting. It is true that exposure to media discussion and website attention could influence OUD knowledge and perception of issues, but this information is not grounded in evidence-based practice standards. Knowledge solely obtained from social media does not equate as formal education which supports the need for continued training in the nursing program curriculum. The findings also suggest a need to evaluate healthcare professionals' OUD knowledge and training level. OUD training should become mandatory in acute care facilities and additional settings, such as community organizations, schools, and churches.

The public health OUD crisis continues to grow, emphasizing the need for nurse educators to implement training programs for nursing students. OUD training could be incorporated into population health curricula for nursing students. Community nursing leaders are positioned to collaborate with the Department of Public Health to initiate community OUD training. Such training requires education which could be formalized and implemented in community settings. Improvements in OUD outcomes are dependent on many factors, including the presence of a knowledgeable workforce. Thus, nursing educators are in an excellent position to lead the charge of preparing RNs for the OUD epidemic. Education and preparation should also flow to APRNs. Future studies should focus on participants' willingness and dedication to helping with the opioid crisis. Positive nurse attitudes toward OUD education and treatment would have a significant impact on team members and their engagement in the OUD epidemic management.

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## AUTHORS CONTRIBUTIONS

Dr. Angela Queen was the corresponding author and responsible for study design, drafting the manuscript, statistical analysis, and final revision of the manuscript. Dr. Corey Claxton and Dr Catherine Fowler assisted with study design, performed data collection and completed revisions. Dr. Jennifer Goldsberry was responsible for table design, revisions and final proofing of the manuscript. All authors contributed equally to the study. All authors read and approved the final manuscript.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## INFORMED CONSENT

Obtained.

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## PROVENANCE AND PEER REVIEW

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## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

## DATA SHARING STATEMENT

No additional data are available.

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## REFERENCES

- [1] World Health Organization. Opioid overdose [Internet]. Geneva: WHO; 2023 Aug [cited 2025 Jun 17]. Available from: <https://www.who.int/news-room/fact-sheets/detail/opioid-overdose>
- [2] Centers for Disease Control and Prevention (CDC). Understanding the epidemic [Internet]. Atlanta: CDC; 2020 [cited 2025 Jun 17]. Available from: <https://www.cdc.gov/drugoverdose/epidemic/index.html>
- [3] United Nations Office on Drugs and Crime. World drug report 2022 [Internet]. Vienna: UNODC; 2022 [cited 2025 Jun 17]. Available from: <https://dataunodc.un.org/content/country-list>
- [4] National Institute on Drug Abuse. Naloxone drug facts. Bethesda (MD): NIDA; 2022.
- [5] Gould K. Got Narcan? *Dimens Crit Care Nurs*. 2019; 38(1). PMID:30499785 <https://doi.org/10.1097/DCC.0000000000000337>
- [6] Williamson C, Martin B, Argoff C, et al. Pain management and opioid therapy: Persistent knowledge gaps among primary care providers. *Journal of Pain Research*. 2021; 3223-3234. PMID:34703298 <https://doi.org/10.2147/JPR.S316637>
- [7] Meadows C, Martin D, LeBaron V. A cross-sectional survey exploring nursing students' knowledge and attitudes regarding opioids and the opioid epidemic. *Pain Manag Nurs*. 2021; 22: 539-48. PMID:33676859 <https://doi.org/10.1016/j.pmn.2021.01.015>
- [8] Bernier J, Barroso C. Discriminative nursing care practices towards patients with opioid use disorder in the hospital setting: An integrative review. *OJIN*. 2024. <https://doi.org/10.3912/OJIN.Vol129No02PPT73>
- [9] Haroun El Rasheed A, El Sheikh M, El Missiry MA, et al. Addiction stigma among mental health professionals and medical students in Egypt. *Addictive Disorders & Their Treatment*. 2016; 15(4): 165-174. <https://doi.org/10.1097/ADT.00000000000000090>
- [10] Shreffler J, Shaw I, McGee S, et al. Perceptions diverge on aspects related to substance use disorder: An analysis of individuals in recovery, physicians, nurses, and medical students. *Sub Abuse*. 2021; 4: 896-904. PMID:33705253 <https://doi.org/10.1080/08897077.2021.1892014>
- [11] Simon R, Snow R, Wakeman S. Understanding why patients with substance use disorders leave the hospital against medical advice: A qualitative study. *Substance Abuse*. 2020; 41(4): 519-525. PMID:31638862 <https://doi.org/10.1080/08897077.2019.1671942>
- [12] Lanzillotta-Raneley J, Leslie J, Little M, et al. Educational program to increase substance use disorder knowledge and decrease stigma in first-year nursing students. *Pain Manag Nurs*. 2020; 21: 435-40. PMID:32593643 <https://doi.org/10.1016/j.pmn.2020.05.002>
- [13] Costello M, Thompson S, Aurelien J, et al. Patient opioid education: Research shows nurses' knowledge of opioids makes a difference. *MEDSURG Nurs*. 2016; 25(5): 307-11.
- [14] Aronowitz S, Compton P, Schmidt H. Innovative approaches to educating future clinicians about opioids, pain, addiction, and health policy. *Pain Manag Nurs*. 2021; 22: 11-4. PMID:32763015 <https://doi.org/10.1016/j.pmn.2020.07.001>
- [15] Foley M, Neville K. The economic impact of the opioid use disorder epidemic in America: Nurses' call to action. *Nursing Economics*. 2020; 38(1): 751-15.
- [16] Compton P, Blacher S. Nursing education in the midst of the opioid crisis. *Pain Manag Nurs*. 2020; 21(1): 35-42. PMID:31358464 <https://doi.org/10.1016/j.pmn.2019.06.006>
- [17] Dunn K, Barrett F, Yopez-Laubach C, et al. Brief opioid overdose knowledge (BOOK): A questionnaire to assess overdose knowledge in individuals who use illicit or prescribed opioids. *J Addict Med*. 2016; 10(5): 314-23. PMID:27504923 <https://doi.org/10.1097/ADM.0000000000000235>
- [18] Williams A, Strang J, Marsden J. Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation. *Drug Alcohol Depend*. 2013; 132(1-2): 383-6. PMID:23453260 <https://doi.org/10.1016/j.drugalcedep.2013.02.007>
- [19] Hines C, Cody S, Eyer J, Coupe L. An opioid education program for baccalaureate nursing students. *J Addict Nurs*. 2021; 32(2): 88-94. PMID:34060759 <https://doi.org/10.1097/JAN.00000000000000407>
- [20] Albery IP, Heuston J, Ward J, et al. Drug and drug problems perceptions questionnaire (DDPPQ). *APA PsycTests*. 2003.
- [21] Mahmoud K, Terhorst L, Lindsay D, et al. Undergraduate nursing students' perceptions of individuals with drug use problems: Confirming the factor structure of the drug and drug problems perception questionnaire. *J Addict Nurs*. 2017; 28(4): 196-202. PMID:29200046 <https://doi.org/10.1097/JAN.0000000000000194>
- [22] Pasman E, Nikolova K, Victor B, et al. Substance abuse and mental health services administration (SAMHSA). Opioid overdose prevention toolkit. Rockville (MD): SAMHSA; 2018.
- [23] Ari M, Oyler J. A substance use disorder training curriculum for internal medicine residents using resident-empaneled patients. *BMC Med Educ*. 2024; 24: 1-5. PMID:38693551 <https://doi.org/10.1186/s12909-024-05472-5>
- [24] Doughty B, Young S, Eggleston W. Assessment of a comprehensive naloxone education program's impact on community member knowledge and attitudes on a college campus. *J Am Coll Health*. 2022; 70(5): 1332-5. PMID:32877623 <https://doi.org/10.1080/07448481.2020.1807992>
- [25] Marshall K, Carney P, Bonuck P, et al. Preparing fourth year medical students to care for patients with opioid use disorder: How this training affects their intention to seek addiction care opportunities during residency. *Med Educ Online*. 2023; 28: 1-5. PMID:36333902 <https://doi.org/10.1080/10872981.2022.2141602>
- [26] Schmuhl K, Nagel S, Tamburro R, et al. Better together: Utilizing an interprofessional course and escape room to educate healthcare students about opioid use disorder. *BMC Med Educ*. 2023; 23(917): 1-8. PMID:38053154 <https://doi.org/10.1186/s12909-023-04899-6>
- [27] Williams J, Syed M, Adesanya A, et al. Educating the community about the opioid epidemic and medications for opioid use disorder. *Am J Addict*. 2021; 31: 433-40. PMID:35411688 <https://doi.org/10.1111/ajad.13287>