

## Pharmacy students' attitude towards opioid epidemic and overdose management

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### Abstract

**Introduction:** Several states provide pharmacists the authority to dispense and counsel on naloxone, but most pharmacy schools provide little to no-training in opioid management for students as a part of their curriculum. The aim of this study was to assess the attitude of pharmacy students towards the opioid epidemic and overdose management.

**Material and Methods:** The study was conducted among pharmacy students enrolled at Rosalind Franklin University of Medicine and Science (RFUMS). An anonymous Qualtrics® survey accompanied by an informed consent was distributed to students at RFUMS.

**Results and Discussion:** A total of 162 out of 200 students (81%) enrolled in the College of Pharmacy completed the survey. Students' attitudes varied by demographics. The majority of students were not prepared to manage opioid overdose situations and administer opioid antidotes, such as naloxone.

**Conclusions:** Overall, the findings of the study indicate that pharmacy students are willing to receive additional education to improve preparedness in managing opioid abuse situations. Hands-on training for opioid abuse management will provide pharmacy students the necessary knowledge and tools to help patients. Pharmacy schools nationwide should incorporate opioid abuse management as a part of their didactic curriculum.

**Keywords:** College of Pharmacy; Naloxone; Opioid abuse; Student opinion; Hands-on training

### 1. Introduction

In 2017, the United States government declared the opioid epidemic a national emergency. In the past two decades, prescription opioid abuse has worsened dramatically in the U.S. and has led to a massive epidemic [1]. Over 60 million patients have had at least one prescription of opioid analgesics filled or refilled [2]. In 2016, over 11.5 million Americans were abusing opioids, and 2.1 million had developed an opioid use disorder (OUD), which resulted in 42,000 deaths. Opioid abuse has a direct relationship with age, race, income level, and education. Overall, 31.4% of high school dropouts are illicit drug users [3].

The opioid crisis has not only led to dependence, but it has also decreased life expectancy in the past three years [4]. Unused opioids that were originally prescribed for pain management are a primary source of diversion, especially among the younger population. Healthcare professionals overprescribing have been the driving force for countless individuals to seek treatment for opioid dependence. In a multi-cohort national study conducted in 2012, approximately one-third of 8,888 high-school seniors reported using opioids for non-medical purpose, which were originally

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prescribed for legitimate medical reasons. When inquired about their motives, respondents indicated that they wanted to “relieve physical pain,” “experiment,” or simply wanted “to feel good or get high”[4].

A longitudinal study testing a similar age group indicated that approximately 117 youngsters visit emergency departments nationwide every day for opioid emergencies [5]. The younger population is not the only population at risk. Opioid abuse and dependence are also alarming issues in new mothers shortly after delivery, and these patients were prescribed more opioids than were used [6]. The findings also suggested that opioids are easily available in this population and is a gateway to potential abuse.

The older population, ages 50 and older, of the United States accounts for the fastest growing rates of opioid abuse and dependence [7]. By 2015, nearly 12 million Medicare patients were prescribed opioids by their physicians. Since 2000, the hospitalization rate due to opioid abuse and dependence has increased by 500%. Older adults are at higher risk for opioid abuse and misuse due to social isolation, multiple comorbidities/diseases, polypharmacy, and chronic pain. Physicians have several important barriers to overcome when assessing and treating geriatric patients due to the lack of the long-term safety and abuse parameters of opioid treatment [8,9].

The medical community in the United States has reached a crisis level and is severely burdened by this emergency. The last line of defense - before a medication is in the hands of the patient - are pharmacists, hence there is need to assess the opinion of future pharmacists on understanding the role of pharmacists, their knowledge and confidence level in managing opioid overdose situations. Along with establishing effective laws and regulations on prescribing opioids, it is also vital that our nation's pharmacists and student pharmacists feel adequately prepared should they encounter an overdose situation. They should also be capable of appropriately explaining, dispensing, and administering naloxone and be trained on how to identify and deal with drug abuse situations. A survey of 484 pharmacists in Florida in 2005 concluded that only 67.5% received two hours or less of training on addiction/substance abuse in pharmacy school [10]. The remaining 29.2% of participants stated that they received no additional education during their schooling.

A similar study done in Massachusetts in 2019 revolved around pharmacists and whether they have sufficient training with dispensing naloxone in community settings [11]. Only 52% of pharmacists understood the importance of calling 9-1-1, a mere 8% knew to start rescue breathing, and only 4% knew about keeping patients in the recovery position.

Many states now give pharmacists the authority to prescribe and dispense naloxone, although there is very little to no training that is provided to pharmacy students. A study at of the third-year pharmacy students showed a higher confidence level than first-year students in terms of naloxone therapy and appropriate dispensing and counseling techniques. This study concluded that providing naloxone training is imperative to properly prepare student pharmacists to care for a patient presenting with signs of opioid overdose [12].

A study of third- and fourth-year pharmacy students on providing naloxone counseling to patients at health departments concluded that 91% of students plan on pursuing certification to dispense naloxone. It also showed that 77% of participants reported a change in their personal views on opioid addiction [13]. Educating pharmacy students and providing hands-on experience during their didactic courses will provide them with the necessary knowledge and tools to help patients with opioid overdose situations.

The objective of this study was to assess the attitude of pharmacy students (years one through four) enrolled at Rosalind Franklin University of Medicine & and Science (RFUMS) towards the opioid abuse crisis.

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## 2. Material and methods

This study was approved by the RFUMS institutional review board (IRB). An anonymous Qualtrics® survey accompanied by an informed consent was distributed to pharmacy students at RFUMS. A total of 162 out of 200 students (81%) enrolled in the College of Pharmacy completed the survey.

The survey instrument was tested for ambiguity for understanding of the words used. The readability of the survey was found to be at a grade of 7.4. The reliability of the survey instrument was tested using a pre-test and post-test Cronbach's coefficient alpha, which was found to be 0.95.

The survey consisted of 16 questions, which included four demographic and 12 Likert-scale opinion questions. The demographic questions focused on students' age, race, gender, and year in pharmacy school. The students were asked to rate their agreement on a scale from “strongly disagree” to “strongly agree”. The opinion questions dealt with the students' perceptions and opinions toward opioid epidemic and their comfort level with management of opioid

overdose. This section presented a series of statements, such as a question on understanding the role of pharmacists, phrased as “I believe I understand the role of. Pharmacist in an opioid crisis”. That was followed by a series of questions assessing students’ comfort level with managing an opioid overdose situation, phrased as “I believe I am prepared to handle a situation, which involves dealing with a patient with in Opioid overdose. Additional questions were based on student opinion about incorporating opioid management training in the pharmacy school curriculum, such as “I believe that adequate training should be provided in pharmacy school”.

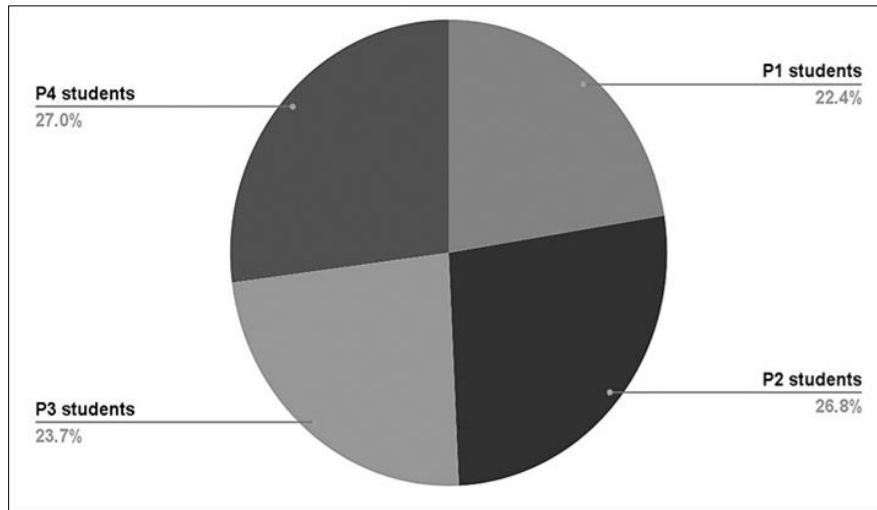
The collected data was coded, verified for data integrity, and analyzed by utilizing the Statistical Package for Social Sciences (SPSS®) 27.0 program. Demographics were analyzed by descriptive statistics. The *t*-test and chi-square tests were used to test the research hypothesis. A 0.05 probability level was considered significant for all analyses.

### 3. Results

Approximately 62.9% of all respondents were reported to be between the ages of 20 and 22 years old, and 22.2% of the population were between the ages of 23-25. The number of respondents also were fairly evenly split between the genders, comprising 82 males and 80 females. The majority of the student population that participated was White (41.9%), followed by Asian (35.1%), Hispanic (12.3%), and African American (9.2%). Of the 162 students, 22.2% were first-year students, followed by 26.5% second-year students, 23.4% third-year students, and 27.7% fourth-year students (Figure 1). All other demographic data are listed in Table 1.

**Table 1** Student Demographics

Variable	Frequency	Percentage
<b>Gender</b>		
Male	82	50.6
Female	80	49.4
<b>Race</b>		
Caucasian	68	41.9
Hispanic	20	12.3
African American	15	9.2
Asian	57	35.2
<b>Age</b>		
20-22	102	62.9
23-25	36	22.2
26-28	12	7.4
29 and up	12	7.4
<b>Pharmacy school year</b>		
P1	36	22.2
P2	43	26.5
P3	38	23.4
P4	45	27.7



**Figure 1** The Distribution of Pharmacy Students by Year

Forty-four percent of the student population had used or abused opioids in the past, and 35.8% had someone in their family that had used or abused opioids. While the importance of the role played by a pharmacist in the management of opioid crisis was understood across all age groups, the respondents between the age groups of 20 and 22–felt unprepared and nervous to manage an opioid overdose situation, as compared to older students.

Ninety-five percent of females and only 43% of males stated that they are aware of the seriousness of the opioid crisis. Seventy-eight percent of both sexes understood the crucial role of a pharmacist in an opioid overdose situation. Of the 82 female respondents, none believed they were prepared to help in an overdose situation, whereas only 41.2% of males considered themselves prepared. Most female students (80%) planned on pursuing certification to appropriately dispense and administer naloxone (Table 2).

**Table 2** Pharmacy students’ opinion on opioid abuse by characteristics

Opinion Characteristics	Gender P value	Race P value	Age P value	Year P value	Mean (SD)
Awareness of opioid crisis	0.001	0.001	0.001	0.001	2.1543 ( $\pm$ 1.61)
Understanding of the role of a pharmacist	0.001	0.001	0.001	0.001	1.931 ( $\pm$ 2.736)
Nervousness to handle an overdose situation	0.001	0.001	0.001	0.001	3.827 ( $\pm$ 1.429)
Lack preparedness to help during an opioid crisis	0.001	0.001	0.001	0.001	4.14 ( $\pm$ 1.017)
Comfortable with injecting naloxone in an individual during an opioid situation	0.001	0.001	0.001	0.001	2.907 ( $\pm$ 1.645)
Lack readiness to help during an opioid overdose	0.007	0.001	0.001	0.001	3.925 ( $\pm$ 1.302)
Willingness to obtain proper certification for opioid overdose treatment	0.001	0.001	0.001	0.001	3.253 ( $\pm$ 1.798)
Belief that all pharmacists should be properly trained for opioid overdose treatment	0.001	0.001	0.001	0.001	4.0679 ( $\pm$ 1.436)
Awareness of all kinds of drugs abused in the vicinity of the pharmacy	0.001	0.001	0.001	0.001	4.586 ( $\pm$ 0.8314)
Belief that if a pharmacist intervened then the opioid crisis can be controlled	0.001	0.001	0.001	0.001	4.3642 ( $\pm$ 1.113)
Belief that adequate training should be provided in pharmacy school	0.001	0.001	0.001	0.001	2.586 ( $\pm$ 1.819)

The same trend was observed among students in their first, second, and third years of pharmacy school, as they felt that they were not prepared to handle an opioid overdose situation. However, 75% of the fourth-year students believed they were adequately prepared and felt comfortable helping someone in an opioid overdose situation.

Comparison of students by race highlighted an interesting breakdown, as a majority of the White, African American, and Hispanic students believed they were not prepared to handle an overdose situation, whereas 58.9% of the Asian population believed they were adequately prepared. A majority of White students (89.8%) believed that they were comfortable injecting naloxone in someone that overdosed on opioids, as compared to students of other races.

Students' attitudes regarding opioid overdose and management varied by demographics. The majority of students were not prepared to manage opioid abuse situations, but to varying degrees. There was a significant difference amongst various age groups in their comfort level of injecting naloxone and managing an opioid overdose situation. Ages 20-22 years appeared to be relatively less prepared, as compared to the other age groups. The third- and fourth-year (P3 and P4) students were marginally more comfortable with the identification and management of an opioid crisis in contrast to P1 and P2 students. Those who had experienced prior opioid abuse in their family, friends, and acquaintances were more familiar with the role of a pharmacist in an opioid overdose situation. Asian and White students were more familiar with the role of a pharmacist and with managing an opioid crisis, as compared to the other race groups. Almost all the students indicated that they were inadequately prepared for managing overdose situations and favored more training and certification.

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#### 4. Discussion

In the current study, most pharmacy students felt they did not possess the required skills to manage overdose situations, naloxone administration, or counseling. Opioid crisis training throughout pharmacy school can be included in experiential rotations, such as in Introductory Pharmacy Practice Experiences (IPPE) and Advanced Pharmacy Practice Experiences (APPE). Additionally, postgraduate opioid crisis training can be implemented in continuing education courses, which would help pharmacists stay up to date on new therapies and treatment regimens. Employers or public policies recommending all pharmacists take some training, as a continuing education requirement, would keep pharmacists up to date on recent evidence-based opioid overdose management.

Opioid abuse and addiction are a swiftly evolving public health crisis and call for innovative scientific solutions and increased commitment to research for developing additional interventions to manage the opioid crisis. The National Institutes of Health (NIH) previously vowed to decrease the time necessary to develop new therapeutics by partnering with government, industry, and academia [14,15].

In this study, most students indicated that they were not prepared to manage opioid overdose situations. There was a significant difference amongst various age groups in their comfort level of injecting naloxone and managing an opioid overdose situation. Opioid abuse management in the didactic curriculum is vital for pharmacy schools. In addition to didactic classroom lectures, real-life simulation experience in an opioid crisis situation can increase students' understanding and confidence in dispensing naloxone and counseling patients [16,17]. The inclusion of an adequate number of questions on the NAPLEX regarding the role of a pharmacist in the management of opioid crisis situation would emphasize the importance of opioid overdose training. It would also indicate that the pharmacists who pass the NAPLEX are sufficiently prepared for such a situation.

Pharmacists play a key role in interprofessional collaboration with other healthcare providers and can bridge the gap between healthcare providers who may have received less instruction in pain pharmacotherapy and addiction education.<sup>14</sup> In this study, almost all the students indicated that they were inadequately prepared for managing overdose situations and favored more training and certification. Interprofessional courses offer pharmacy students the opportunity to advocate for safer, effective medications to manage chronic pain to students in other healthcare disciplines.

In the normal course of practice, community pharmacists continuously evaluate the appropriateness of medication use, monitor for potentially risky uncoordinated care, and check for drug interactions. Because pharmacists are typically the final healthcare professional patients encounter before using prescription medications, they are well positioned to screen for diversion, monitor for potentially problematic use of prescription opioids, and educate patients about opioid-related risks [18]. In addition, pharmacists are obligated to be attentive to behavior that may indicate potential abuse, such as fills at multiple pharmacies, early fills, cash payments, and/or prescription from several prescribers. Pharmacist interventions, advocacy, and availability are beneficial, and more efforts should be made to provide safe and effective treatment for patients. Pharmacists nationwide can expand their involvement by consolidating risks and patient-

centered opioid screening into existing workflows. Proactive workflows, such as asking open-ended questions and active listening, in different practice settings can alert pharmacists to opioid misuse [19].

There is a need to develop and test strategies and resources for enhancing pharmacists' skills and confidence in communicating with patients regarding opioid misuse, communicating inter-professionally with providers to improve patient care, managing overdose situations, conducting screening for substance overuse, and referring patients to substance use treatment [20].

The study findings were limited by the operational definition of this study, which focused on pharmacy students at Rosalind Franklin University of Medicine and Science. Therefore, the results cannot be generalized to other pharmacy schools or faculty.

Suggested future studies include surveying pharmacy students across the nation in various pharmacy schools and geographic locations. Pharmacy students may have different levels of awareness, preparedness, and willingness for additional opioid crisis training in different geographical locations and may differ by specific pharmacy schools. A follow-up longitudinal study in which students are surveyed at the beginning of pharmacy school, during, at graduation, and post-graduation with at least one additional opioid crisis training intervention may better assess the confidence and preparedness of students and pharmacists to manage an opioid crisis situation.

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## 5. Conclusion

The findings of students being inadequately prepared to manage overdose situations, along with the prevalence and trends of the opioid epidemic, indicate the need for pharmacy students to have more training and certification during pharmacy school. Educating and providing hands-on experience for opioid abuse management provide pharmacy students with the necessary knowledge and tools to help patients. Pharmacy schools nationwide should incorporate opioid abuse management as a part of their didactic curriculum. Further research is needed to explicitly address the appropriate level, timing, and approach of opioid abuse management in the curriculum.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

Ateequr Rahman, Noopur Walia, Yelena Sahakian, Tehreem Khaliq, and Lejla Cukovic have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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