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The BoilerWoRx Project: Mobile Public Health Advocacy

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THE BOILERWORX PROJECT:

Mobile Public Health Advocacy

Carolanne Wartman, Kevin Fekete, Carol Ott, Catherine Scott, Nicole Noel, Fatima Khan, and Carrie Kovacik (*Pharmacy*)

STUDENT AUTHOR BIO SKETCHES

Carolanne Wartman, Kevin Fekete, Fatima Khan, and Carrie Kovacik are students in the College of Pharmacy. These students have worked closely with **Dr. Carol Ott, Dr. Nicole Noel, and Cathy Scott** on implementing various BoilerWoRx activities, including a continuing education program. These students developed surveys for participants and analyzed the data to determine if there was a meaningful change in perspectives on substance use disorder and the like. All of the students have an interest in working with underserved patient populations in the future. The purpose of this research is to increase awareness in addition to providing outreach and support to community health workers.

INTRODUCTION/BACKGROUND

In 2017 alone, it is estimated that more than 47,000 Americans died from an opioid overdose and 1.7 million Americans suffered from substance use disorder. Additionally, the number of drug-related health care consequences are estimated to cost the United States about \$78.5 billion a year. Purdue University's College of Pharmacy recognizes that the opioid epidemic has not only impacted the nation, but it has also impacted our state, campus, and the communities in which it resides. In 2017, Indiana saw its highest rate of overdose deaths, with about 5 Hoosiers dying each day. Between 2016 and 2017, Indiana had the third-highest increase in overdose-related deaths in the United States, and Purdue's surrounding communities were not left untouched. This became more apparent in October 2017, when Tippecanoe County declared a public health emergency due to the identification of a hepatitis C epidemic. This epidemic led to the launch of the syringe service program called Gateway to Hope.

One of the main barriers to care for these individuals is the stigma surrounding substance use disorder. Stigma can be defined as "a mark of disgrace or infamy." For those struggling with addiction, stigma poses significant obstacles to prevention, treatment, and recovery efforts. The shame and embarrassment that are direct results of stigma prevent many people from seeking help, exacerbating the harsh realities that they face. Unfortunately, an additional obstacle is the stigma that persons with a substance use disorder may carry among health care professionals. Studies have shown that if health professionals lack adequate education and training about this patient population, the result is patients' diminished feelings of empowerment and subsequent treatment outcomes.

In light of this epidemic, students and faculty in the College of Pharmacy developed a plan to advocate for appropriate evidence-based resources and treatment of substance use disorders, educate the community on principles of harm reduction, and reduce the stigma surrounding addiction. This led to the idea of creating a mobile public

Figure 1. Executive board meeting for CPNP Purdue for the 2019–2020 academic school year.

health initiative, BoilerWoRx. The initiative focuses on responding to health crises within our local communities. It is a multidisciplinary effort with students from engineering, nursing, liberal arts, medicine, and more who offer education to both students and community members (Figure 1). In order to volunteer with BoilerWoRx, students must complete a comprehensive training, which includes educational TED Talks, naloxone training, and depression/drug abuse screening tool training. At each event, drug disposal kits, wellness education, syringe service assistance, naloxone distribution, community resources, and mental health assessments are available for the community members. Currently, BoilerWoRx is tracking quality outcomes from these community events. Data collection includes location of the event, community members engaged, drug destruction bags and naloxone doses distributed, and individual use of the destruction bags.

In order to increase awareness and knowledge surrounding substance use disorder, BoilerWoRx has developed and implemented a continuing education series for a variety of health care disciplines, such as nursing, dentistry, and others. Through this effort, BoilerWoRx also aims to decrease the stigma that individuals with substance use disorders may face in their communities. Over time, this will ideally translate to improved public health outcomes across several counties in Indiana. The primary objective of this project is to provide insight on current attitudes toward substance use disorders in several counties within North Central Indiana and hopefully find that attitudes are improved after participation in the continuing education presentation.

METHODOLOGY

With help from the Area Health Education Center, BoilerWoRx created a continuing education series for health care professionals in all disciplines, including, but not limited to, prescribers and community health workers. This continuing education was free for the participants and took place within secondary schools throughout North Central Indiana. The presentation lasted two hours and was worth one hour of continuing education credit. The participants were asked to complete a pre- and postsurvey on various topics that were to be covered that day. Informed consent was given prior to completing the surveys and completion of these surveys did not affect participants' ability to obtain credit for the education. Each participant was asked to create a unique 6-digit code to de-identify the surveys and link the pre- and postsurveys to a specific individual.

The presurvey was comprised of demographic data collection and 15 knowledge-based statements related to topics covered within the upcoming presentation. Demographic data included the participant's age, zip code, sexual orientation, health care profession, highest level of education, estimate of the percentage of their patients with substance use disorder, satisfaction treating patients with substance use disorder, and estimated success treating this patient population. The 15 knowledge-based statements were formatted into a 5-point Likert scale with answers varying from 1 (strongly agree) to 5 (strongly disagree). Participants then viewed two separate presentations, one on "Medication-Assisted Treatment and Substance Use Disorder" by Dr. Carol Ott and another on "Harm Reduction Strategies and Naloxone Administration" by the Tippecanoe County Health Department.

Following these presentations, the postsurvey was completed, which contained the same 15 knowledge-based statements from the presurvey. The standard deviations and *p*-values were calculated for each statement utilizing a paired *t*-test in order to determine if there was a statistically significant change in attitudes among the health care professionals. This change in attitude would be used to help identify whether proper education and training were useful in decreasing the stigma associated with substance use disorder and its treatment.

RESULTS

Demographic Data

A total of 99 health care professionals within 6 different counties completed surveys. The majority of participants were white (82%) females (70%) (Figure 2).

Figure 2. Gender and ethnicity distribution of participants.

Figure 3. Age, in years, distribution of participants.

Figure 4. Level of education distribution of participants.

The age of the participants ranged from 25 to 66+ years old (Figure 3).

Additionally, the participants had differing levels of education. However, the percentage of those having a master's degree (51%) was just over majority (Figure 4).

Participants were also asked to estimate the percentage of patients they manage with opioid use disorder (OUD) and substance use disorder (SUD) (Figure 5). Most participants estimated that they managed about 1–10% of patients with opioid use disorder (52%) and substance use disorder (36%).

Finally, participants were asked to rate their satisfaction with treating patients/clients with substance use disorder, as well as estimate their percentage of successful treatment outcomes for individuals with substance use disorder (Figures 6 and 7). Many participants were either satisfied (24%), dissatisfied (26%), or neither satisfied nor dissatisfied (39%) with treating patients/clients with substance use disorder.

However, in regard to the participant's estimated percentage of successful treatment outcomes, many individuals were either dissatisfied (30%) or neither satisfied nor dissatisfied (50%).

Figure 5. Percentage estimation of participant's patients with opioid and substance use disorders.

Figure 6. Participant satisfaction with treating patients with substance use disorder.

Figure 7. Participant's estimated percentage of successful treatment outcomes.

Survey Results

Overall, our goal was to see a meaningful change in attitudes toward substance use disorder following attendance in the continuing education event. We plan to use the results from the surveys in order to make changes to the education series. The 15 knowledge-based statements were:

1. Substance use disorder is a treatable illness.
2. A substance-dependent person cannot be helped until he/she has hit rock bottom.
3. A substance user who has relapsed several times probably cannot be treated.
4. Most persons with substance use disorder are unpleasant to work with as patients.
5. Substance use disorder is associated with a weak will.

6. Heroin is so addicting that no one can really recover once he/she becomes addicted.
7. Persons with substance use disorder should only be treated by specialists in the field.
8. A physician who has substance use disorder should not be allowed to practice medicine again.
9. Long-term outpatient treatment is necessary for the treatment of substance use disorder.
10. Paraprofessional counselors can provide effective treatment for substance use disorder.
11. Coercive pressure, such as threat or punishment, is useful in getting resistant patients to accept treatment.
12. Medication-assisted treatment is essential to successful recovery in opioid use disorder.
13. Naloxone should be administered to any person suffering from opioid overdose without limiting the number of doses given or the number of times a person overdoses.
14. Harm reduction programs are an important tool to decrease the spread of infectious disease.
15. Fewer syringes are found in the streets and public places when a community has a syringe services program.

Means and standard deviations for each statement were analyzed per county. After combining each county, a paired *t*-test was run using the means from each statement to find the respective *p*-value. A *p*-value of <0.05 was used to show a significant change in attitudes toward substance use disorder specific to each statement. It is important to note that we were analyzing for any change and not for a change in a specific direction.

Table 1 combines the results, divided into each county and each specific statement. It was found that there was a statistically significant change in attitudes among 13 of the 15 statements. The two statements that did not show a statistically significant change were, "Persons with substance use disorder should only be treated by specialists in the field" ($p = 0.44$) and "Long-term outpatient treatment is necessary for the treatment of substance use disorder" ($p = 0.12$). Many individuals did not change their pre- and postsurvey answers for these two statements.

COMMUNITY IMPACT

BoilerWoRx has given almost 10,000 drug destruction bags and over 150 doses of naloxone, and has educated

Table 1. Average answer and standard deviation for each statement on the pre- and the postsurveys with the *p*-value calculated for the statement as a whole.

AMIQ SURVEY (Average scores displayed below on a 5-point Likert scale: 1 = Strongly agree, 2 = Slightly agree, 3 = Neither agree nor disagree, 4 = Slightly disagree, 5 = Strongly disagree)													
Survey Questions	CLINTON		HOWARD		CASS		WHITE/BENTON		FULTON		CARROLL		P-VALUES (2-sided t-tests)
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
Substance use disorder is a treatable illness.	1.83 (0.75)	1.5 (0.55)	1.9 (0.64)	1.6 (0.94)	1.81 (0.49)	1.38 (0.5)	1.63 (0.52)	1.13 (0.35)	2 (0.65)	1.7 (0.73)	1.89 (0.32)	1.78 (0.94)	<0.01
A substance dependent person cannot be helped until he/she has hit rock bottom.	4.33 (0.52)	4.17 (0.41)	3.65 (0.93)	4.3 (0.8)	3.92 (0.8)	4.38 (0.57)	4.5 (0.53)	4.5 (0.53)	3.9 (0.79)	4.35 (0.59)	4.11 (0.32)	4.22 (0.94)	<0.01
A substance user who has relapsed several times probably cannot be treated.	4.33 (0.52)	4.5 (0.55)	3.61 (0.92)	4.4 (0.6)	3.92 (0.69)	4.46 (0.71)	4.5 (0.53)	4.38 (1.41)	4.05 (0.89)	4.35 (0.59)	4.06 (0.24)	4.12 (0.92)	0.04
Most persons with substance use disorder are unpleasant to work with as patients.	4 (1.1)	4.5 (0.55)	3.35 (1.04)	3.9 (0.91)	3.31 (1.05)	3.88 (0.82)	3.5 (1.07)	3.75 (0.71)	3.45 (1.0)	3.8 (0.62)	3.83 (0.51)	3.83 (0.62)	<0.01
Substance use disorder is associated with a weak will.	4.33 (0.52)	4.67 (0.52)	3.45 (1.05)	3.9 (0.97)	4.04 (0.87)	4.35 (0.63)	4.25 (0.46)	4.5 (0.53)	4 (0.92)	4.25 (0.44)	3.83 (0.99)	4.17 (0.71)	<0.01
Heroin is so addicting that no one can really recover once he/she becomes addicted.	4.2 (0.45)	4.17 (0.41)	4 (0.92)	4.3 (0.66)	4.04 (0.63)	4.54 (0.51)	4.38 (0.52)	4.75 (0.46)	4.05 (0.76)	4.3 (0.47)	3.83 (0.38)	4.22 (0.43)	<0.01
Persons with substance use disorder should only be treated by specialists in the field.	2.5 (1.22)	2.33 (1.03)	2.72 (1.14)	2.45 (1.1)	2.88 (1.28)	3.04 (1.37)	3.25 (1.16)	3.5 (1.31)	3.1 (0.85)	3 (1.17)	2.89 (0.76)	3.28 (0.89)	0.44
A physician who has substance use disorder should not be allowed to practice medicine again	3 (1.1)	3.83 (0.41)	3.6 (0.75)	3.8 (0.77)	4.12 (0.82)	4.12 (1.07)	3.63 (1.06)	4 (1.07)	3.75 (0.72)	3.85 (0.59)	3.61 (0.61)	3.71 (0.59)	0.04
Long-term outpatient treatment is necessary for the treatment of substance use disorder.	1.67 (0.52)	1.67 (0.52)	2.05 (0.69)	2.15 (1.31)	4.12 (0.97)	2.04 (0.96)	1.63 (0.74)	1.63 (0.74)	2.05 (0.76)	1.68 (0.48)	2.39 (0.70)	2.06 (1.0)	0.12
Paraprofessional counselors can provide effective treatment for substance use disorder.	2.67 (0.82)	2 (0.63)	2.3 (0.73)	1.95 (0.6)	2.12 (0.71)	1.73 (0.6)	1.88 (0.64)	1.5 (0.53)	2.1 (0.72)	2.05 (0.85)	2.28 (0.46)	2.11 (0.47)	<0.01
Coercive pressure, such as threat or punishment, is useful in getting resistant patient to accept treatment.	4.17 (0.75)	4.5 (0.55)	3.67 (1.09)	3.95 (0.94)	4.08 (0.74)	4.42 (0.76)	4.38 (0.52)	4.63 (0.52)	4 (0.73)	4.47 (0.51)	4.06 (0.87)	4.33 (0.77)	<0.01
Medication-assisted treatment is essential to successful recovery in opioid use disorder.	2.17 (0.98)	2.17 (0.98)	2.5 (0.83)	2 (0.86)	4.08 (0.96)	1.69 (0.84)	2.63 (0.92)	1.38 (0.52)	2.4 (0.50)	1.79 (0.63)	2.33 (0.49)	1.89 (0.32)	<0.01
Naloxone should be administered to any person suffering from opioid overdose without limiting the number of doses given or the number of times a person overdoses.	2.67 (1.21)	1.67 (0.52)	3 (0.97)	1.95 (1.1)	2.58 (0.99)	1.42 (0.5)	2.88 (1.13)	1.25 (0.46)	2.65 (1.18)	1.53 (0.51)	2.89 (1.13)	1.78 (0.43)	<0.01
Harm reduction programs are an important tool to decrease the spread of infectious disease	1.67 (0.82)	1.5 (0.55)	2 (0.56)	1.5 (0.51)	1.88 (0.71)	1.42 (0.5)	1.5 (0.53)	1 (0)	1.9 (0.55)	1.26 (0.45)	2.17 (0.51)	1.67 (0.59)	<0.01
Fewer syringes are found in the streets and public places when a community has a syringe services program.	2.17 (0.41)	1.67 (0.82)	2.78 (0.83)	1.6 (0.6)	1.88 (1.06)	1.58 (0.7)	2.38 (0.74)	1.13 (0.35)	2.35 (0.81)	1.53 (0.51)	2.44 (0.78)	1.61 (0.61)	<0.01
*Results are reported as mean (standard deviation) **Highlighted P-values emphasize a statistically significant difference ($p < 0.05$) between pre and post survey ***This is initial cohort data representative of healthcare professionals and community health workers in the rural counties where CE presentations took place													

over 1,500 community members in less than two years of the program's existence. The continuing education is an ongoing series taking place in numerous counties throughout the state of Indiana and is focused on providing further education to rural health care workers. The research focuses on how effectively attitudes are impacted and stigma is reduced surrounding these topics among health care professionals. The early results of the research have demonstrated that this continuing education has improved the understanding and awareness of rural health care workers. Across the six counties where the study was conducted, there were around 100 participants. If each participant interacts with an average of 10 patients a week, it is estimated that we are impacting about 1,000 community members each week. As we expand our mission across additional counties, we can estimate that each session impacts about 150 members within the community. As perceptions of substance use disorder change and, hopefully, improve, health care professionals may have a better understanding of the disease and employ appropriate measures to provide treatment, barring any consequences from stigma.

A specific challenge that was experienced with this project pertains to the immediate nature of responses. It can be expected that after listening to a 2-hour-long

presentation, participants may have answered in a manner that would look different than if the postsurvey was given after a longer period of time. With more time to absorb the presented information, a different array of responses and values might have been seen. Additionally, while we are touching a variety of health care disciplines, there is extensive variability in general background knowledge and bias on substance use disorder, which could affect participation and overall opinions of the material. Due to participation being completely voluntary, some individuals chose not to participate in the survey portion, which limits our sample size. Nonetheless, BoilerWoRx hopes that through these educational events, there will be an improvement in access and care provided to individuals who suffer from substance use disorder in the North Central Indiana area.

STUDENT IMPACT

For students, BoilerWoRx offers many opportunities to obtain new skills, grow as leaders, and impact the local communities around us. In order to volunteer with BoilerWoRx, a standardized curriculum must be completed to ensure that volunteers are prepared to interact with community members and provide accurate information and resources. The curriculum includes learning to provide

depression screenings and drug abuse screenings, and to properly administer naloxone, in addition to empathy training to aid in understanding the variety of individuals the students may interact with in the community. Providing a standardized curriculum comes with its own barriers as well. The screening tool training and naloxone administration training are both live, in-person trainings that the students need to complete in order to volunteer. However, the varied schedules of college students can pose a challenge when attempting to find dates and times that work for everyone to deliver these trainings. With the help of our health department trainer, our team was able to provide trainings at a later date for students who were unable to attend the scheduled sessions.

Additionally, each member of the BoilerWoRx research team obtained Collaborative Institutional Training Initiative certification, compiled data, performed statistical analyses, and developed a basic understanding of a research process. After three of the continuing education sessions had been completed, the student research team compiled the data into a poster presentation at the College of Psychiatric and Neurologic Pharmacists Annual Meeting in April 2019 (Figure 8). The team developed and presented two posters at the Annual Meeting that covered the continuing education research as well as a summary of BoilerWoRx as a whole. The abstracts for both of the posters were published in *Mental Health Clinician*, and the research team was also invited to present at the newly started Graduate Seminar Series hosted by the Regenstrief Center for Healthcare Engineering. These opportunities provided more public speaking opportunities for students.

Figure 8. CPNP Purdue members at the NAMI meeting joined by TCHD executive assistant Amanda Balser and advisor Dr. Carol Ott.

However, a very notable and lasting impact on us all was addressing any preconceived notions that we had. As pharmacy students, we have a passion for creating awareness surrounding substance use and other disease states. We were unsure of how other health care professionals perceived individuals struggling with this disorder. This study challenged us to think about how we might have previously considered other professionals' attitudes, many of whom are prescribing the very substances that can be abused. After completing the study and analyzing the results, our preconceptions were positively impacted, as we know that going forward in our work, we have the support of other health care professionals.

Overall, these students were able to obtain unique and powerful experiences that are integral to their future careers. In-depth research experience, publications, and presentations are all skills and opportunities necessary for future leaders, especially in the health care field. As the most accessible health care providers, pharmacists play a large role in abolishing stigma. The ability to understand how underlying stigma can affect the treatment that patients receive is important as it contributes to creating civic-minded leaders in any profession. When we realize how our perceptions can affect those around us, we start treating all patients individually—providing them with patient-centered care.

CONCLUSION

Stigma continues to be a major factor that prevents patients with substance use disorder from seeking and receiving necessary treatment. Negative perceptions surrounding this patient population can affect how health care professionals provide care for their patients.

Through continuing education events, our team hopes to educate health care professionals about the principles of harm reduction, medication-assisted treatment options, and proper naloxone administration while reducing the stigma associated with substance use disorder. The continuing education events have proven to be effective in their ability to educate and change attitudes toward patients with substance use disorders. If we can continue educating health care professionals on each of these principles, we can hopefully have a positive impact on the care provided to this specific patient population. The opportunity to improve access and care provided to those who suffer from substance use disorders is a worthwhile venture toward improving the communities we live in. BoilerWoRx students receive hands-on experience in understanding stigma and how it translates to poor

Figure 9. Students joining BoilerWoRx program director Cathy Scott at a campus-wide event.

patient outcomes. By participating in these events, these students are creating a lifelong opportunity to be the voice for individuals who feel they cannot use their own (Figure 9).

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