Improving Clinician Preparedness to Address Xylazine Use Within the Veteran Population: A Quality Improvement Project

Christine M. Allen, BSN RN

Oregon Health & Science University School of Nursing

NURS 703B: DNP Project

Tara O'Connor DNP PMHNP – Chair

Winter 2024

Abstract

Xylazine, a non-opiate animal tranquilizer, has emerged as the most prevalent adulterant in illicit drugs and is contributing to overdose deaths. Xylazine is unregulated by the FDA and presents unique challenges to healthcare providers due to its severe psychological and physiological effects. This quality improvement project aimed to enhance clinician preparedness to address xylazine exposure within the Veteran population served by a large metropolitan Veterans Affairs Medical Center in the Northwestern United States. Drawing from the Institute for Healthcare Improvement's Model for Improvement, an educational intervention was implemented to increase clinician knowledge and preparedness. The intervention included educational sessions followed by discussions, and supplemented by pre- and post-intervention surveys to gauge knowledge acquisition and perceived impact. Results of the intervention demonstrated promising outcomes with participants reporting increased awareness and confidence in identifying and treating xylazine exposure. Participants working with high rates of substance use highlighted the relevance of xylazine education to patient care and expressed interest in further training, xylazine testing resources, and protocol development. Despite the project's limitations, including varying levels of perceived relevance among clinicians, it underscores the critical need for ongoing education and protocol development. This quality improvement project represents a crucial step toward enhancing clinician preparedness to mitigate the risks associated with xylazine exposure within the Veteran population. Continued efforts to expand education and refine clinical protocols are essential to addressing the evolving challenges posed by substance use.

Keywords: Xylazine, substance use, quality improvement, clinician education, Veteran population, overdose prevention

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Problem Description

Xylazine is a non-opiate animal tranquilizer that is the most common adulterant added to illicit drugs and is increasingly linked to overdose deaths (Center for Disease Control and Prevention (CDC), 2023). Xylazine is known as “tranq” (or “tranq dope” when combined with opioids) and is commonly used in combination with fentanyl and heroin, but has also been detected in cocaine, methamphetamine, and a variety of other drugs (Multnomah County Health Department, 2023). It is not approved by the Food and Drug Administration (FDA) for use in humans and is not a controlled substance under the U.S. Controlled Substances Act (United States, Drug Enforcement Administration (DEA), 2022).

When used by people, xylazine causes extreme sedation, respiratory suppression, hypotension, and bradycardia. In combination with fentanyl or other opioids, xylazine increases risk of fatal overdose by further reducing respiratory function (United States, DEA, 2022). Overdoses involving xylazine can be difficult to identify as they often appear to be opioid overdoses, but since xylazine is not an opioid, naloxone does not reverse its effects. Xylazine is typically intravenously injected but can also be ingested orally or by smoking, snorting, or subcutaneous and intramuscular injection (Gupta et al., 2023). Users who inject xylazine, or drugs that are mixed with xylazine, are at risk for the development of severe soft tissue injuries that can lead to necrotic tissue and amputation (CDC, 2023).

Research shows that the Northeastern U.S. has experienced the largest impact of xylazine use to date, with overdose deaths involving xylazine increased from 2% to 26% in Pennsylvania between 2015-2020 (Friedman et al., 2022.). The DEA (2022) findings between 2020 and 2021 show that the use of xylazine is spreading rapidly throughout the U.S. with largest increases seen in the Southern (193% increase) and Western (112% increase) regions. The CDC estimates that the number of drug related

deaths in the U.S. involving xylazine grew from 260 deaths in 2018, to 3480 deaths in 2021(CDC, 2023; Gupta et al., 2023). Although actual prevalence of xylazine in the metropolitan area where this project took place is unknown due to limited testing, it was confirmed in two overdose deaths in 2022 (Multnomah County Health Department, 2023).

Available Knowledge

Much of what is known about the effects of xylazine is through anecdotal report by people who use xylazine alone or in combination with other illicit drugs. Some users report intentionally seeking out opioids mixed with xylazine because xylazine has a longer-lasting effect than fentanyl alone (Friedman et al., 2022; United States, DEA, 2022). Many other users are unaware of the presence of xylazine in drugs they purchase and should be informed of xylazine's effects, complication in overdose, and risk of developing necrotic wounds (CDC, 2023).

The significant increase of xylazine's presence in the U.S. illicit drug supply makes increasing knowledge an important issue facing clinicians and patients. Clinicians unfamiliar with xylazine may not recognize how xylazine impacts a person's symptoms which may result in inadequate care for physical and psychological drug effects (Gupta et al., 2023). To date, there is limited data available to guide clinical decision making, particularly in the medical center's metropolitan area where incidence of xylazine intoxication is largely unknown (Multnomah County Health Department, 2023). The White House Office of National Drug Control Policy declared xylazine an emerging threat and is developing a response plan as of April 2023 (the White House, 2023). Dissemination of comprehensive data on xylazine use, and its potential harm, is necessary to prepare health care providers to address xylazine's threat to patients and the communities in which they provide care.

Rationale

The Department of Veterans Affairs Medical Center (VA) in the large metropolitan area in the Northwestern United States does not currently test for xylazine. The prevalence of xylazine exposure

among the local Veteran population is unknown. A project cause and effect diagram is included in Appendix A (see Appendix A for more details).

The Model for Improvement developed by the Institute for Healthcare Improvement (IHI) was used as the framework for this improvement project. The IHI Model for Improvement is designed to support effective changes within healthcare systems and relies on small, yet rapid tests of change using the Plan-Do-Study-Act (PDSA) cycles (Institute for Healthcare Improvement, n.d.). The utilization of PDSA cycles allows members of the multidisciplinary team to evaluate and provide input into the impact of interventions provided within each PDSA cycle (Provost et al., 2020).

Informal inquiry into VA clinician knowledge about xylazine illustrated a significant knowledge deficit and illuminated interest in increasing clinical knowledge base. Consistent with IHI and the Institute of Medicine's (IOM) goals for safe, effective, equitable, and timely care, it is imperative that clinician knowledge base be expanded to meet the demands of an ever-changing community (Committee on Quality of Health Care in America, Institute of Medicine., 2001). Systematic reviews have concluded that continuing medical education plays a critical role in healthcare by improving both the performance of healthcare professionals and ensuring that patients receive high-quality and timely care (Phillips et al., 2023). Considering lack of clinician training and identified protocols in addressing xylazine, increasing clinician knowledge base is likely to improve outcomes for patients who use illicit drugs.

Specific Aim

The aim of this quality improvement project was to increase VA clinician knowledge and preparedness to identify and treat xylazine exposure within the Veteran population served in the metropolitan area by March 2023. The overarching goal was for clinicians to self-report a 50% or greater increase in awareness, comfort, knowledge and preparedness to treat xylazine use.

Methods

Context

The VA hospital serves Veterans living throughout Oregon and Washington. This project focused on clinicians working within the Behavioral Health and Substance Abuse Treatment Programs (SATP) across two hospital campuses as well as outpatient clinics within the service area. Under the arm of the VA medical center within the service area there are a variety of mental health and addiction medicine treatment options. Veterans diagnosed with substance use disorders (SUDs) have access to psychological and pharmacological treatment of substance use. They can access care on an inpatient, residential, and outpatient level depending on individual need. The clinical team is made up of medical doctors (MDs) including psychiatrists and internal medicine physicians, advanced practice registered nurses (APRNs), licensed clinical social workers (LCSWs), clinical psychologists, registered nurses (RNs), and licensed practical nurses (LPNs).

Recent prevalence of substance use among Veterans suggests that 11% of Veterans meet diagnostic criteria for SUD (Teeters et al., 2017). Since the early 2000s the VA has observed a steady increase in overdose deaths among Veterans. The increase in SUD and overdose deaths among Veterans is impacted by a variety of factors. These factors include comorbid mental health diagnosis, iatrogenic effect of opiate prescription practices, increased use of synthetic opioids such as fentanyl, and increased methamphetamine use (Bennett et al., 2022).

Intervention

The primary intervention in this quality improvement project was to provide education on current xylazine knowledge base to the clinical staff that provide care for Veterans experiencing SUDs and mental health disorders. The intervention included a 20-minute presentation followed by a group discussion in which participants shared their personal experiences and observations of xylazine as well asking questions or providing feedback to the presenter.

Anonymous pre- and post- intervention Likert scale and multiple-choice surveys were distributed electronically. Surveys were distributed as open, anonymous links via electronic mailing lists to ensure survey distribution to all staff that were invited to the presentation. The intervention included two PDSA cycles, expanding to interdisciplinary team members at two sites within the VA hospital service area as outlined in Appendix A. The intervention ran from November 2023 through December 2023.

Study of the Intervention

To understand and measure the effectiveness of the intervention, participant feedback through survey questionnaires and post-intervention discussion were obtained. Evaluation of the pre- and post-intervention surveys assisted in understanding the potential impact of knowledge that was acquired because of the intervention. Additionally, to measure the perceived benefit to patient outcomes, field notes including participant reactions, perceived value of the intervention, and other participant insights were incorporated. The study of the intervention also included monitoring of organizational, local, state, and national dissemination of xylazine related information.

Measures

The primary outcome measure for this quality improvement project was clinician report of improved preparedness to recognize and provide treatment for patients exposed to xylazine. Process measures included the number of clinicians who completed the educational intervention, pre-, and post-intervention surveys. Balancing measures to consider included increased burden on clinician workflow considering busy clinic workloads. To assess that the data is complete, accurate and current, results of clinician surveys were reviewed on an ongoing basis throughout the intervention timeframe. Additionally, monthly literature searches were completed throughout the project to identify any updates to treatment recommendations that should be incorporated into the intervention.

Analysis

This improvement project was implemented over two months between November 2023 and December 2023. The survey data, participant feedback, and current evidence were reviewed and analyzed after each PDSA cycle. The responses to clinician pre- and post-surveys provided both quantitative and qualitative data. No patient specific data was collected during this project; however, clinicians provided insight into the presence of xylazine within their community and care setting. Quantitative data includes the number and discipline of clinicians who completed the intervention, while qualitative data identified clinician perceived benefit of the intervention and its potential impact on patient care.

Ethical Considerations

All clinic staff were informed of the project during staff meetings and via email invitation. Participation in the improvement project was voluntary and participants gave their consent to participate by completing the pre- and post- surveys. All survey responses were de-identified and securely stored. Participants were informed that their participation was voluntary and that all survey responses were anonymous and de-identified. Intervention delivery was scheduled in advance and adhered to planned time limits to avoid interfering with clinical functions. The participating clinical sites gave consent to the project by signing a letter of support. A proposal for this quality improvement project was submitted to the VA and Oregon Health & Science University (OHSU) Investigational Review Boards (IRBs) and was deemed to not be research (see Appendix C for details).

Results

The quality improvement project began in April 2023 and continued through January 2024 (see Appendix B for project timeline details). The initial interest in xylazine education was illuminated through informal staff interviews during April and May of 2023. Interest was expressed by clinicians at three VA clinical settings and based on report of suspicion and concern that xylazine presence in the

community was increasing alongside the increase in fentanyl use within the metropolitan area. Informal interviews conducted in the spring and summer of 2023 with Veterans who use illicit drugs suggested that people who use drugs were often more aware of the presence of xylazine than the clinicians who provide care, either from the having used xylazine themselves or through the experiences of others in their community. The Veterans interviewed most notably identified the extreme sedation and psychomotor retardation that occurs with xylazine use.

In July 2023 a VA hospital in Texas offered the first formal xylazine education made available to VA staff on a national level. The knowledge base used in the intervention for this quality improvement project paralleled components of the VA xylazine education and were consistent with the current evidence about xylazine. The educational materials and pre- and post-intervention surveys were designed in October and November of 2023 and both PDSA cycles of delivery of the intervention were completed in December of 2023.

The intervention was delivered at two virtual staff meetings in December 2023 and included a total of 24 participants. Seventeen clinical staff returned the pre-intervention survey. All respondents (100%) agreed that xylazine education would increase their knowledge and preparedness to treat xylazine exposure. Twelve (70.59%) respondents to the pre-intervention survey reported feeling no confidence in their ability to treat patients exposed to xylazine. Pre-survey respondents reported their current xylazine knowledge base as very low (29.41%), low (47.06%), and moderate (23.53%), with no respondents reporting high or very high xylazine knowledge. See Appendix D for pre-intervention survey and results.

Pre- intervention surveys were sent 24 hours prior to delivery of the intervention as well as immediately prior to the start of the intervention, with time allotted to allow for participant completion. Qualitative data, collected as pre-intervention survey comments, was obtained by 82.35% of participants. The qualitative data elucidated significant interest in learning about xylazine with identified

interest areas including screening, treatment, detox, withdrawal, and impact on comorbid mental health concerns.

The post-intervention survey was completed by 11 participants. The post-survey was sent as a virtual link immediately following the intervention as well as through email to all participants immediately following the intervention and 48 hours post-intervention. The low response to the post-survey may be because most of the attendees at the December 14, 2023, session attended virtually while in a conference room rather than from their personal workstation that allowed for immediate completion of the post-survey.

Of the collected post-intervention responses all participants strongly agreed (72.73%) or agreed (27.27%) that the xylazine education increased their xylazine knowledge. Ten respondents (90.91%) reported that the educational content was relevant to their patient population and increased their ability to provide harm reduction education to Veterans who use drugs. One survey question that assessed overall preparedness to treat exposure to xylazine was excluded due to a survey design flaw that changed the order of the Likert-scale responses and resulted in inconclusive results. Qualitative data was collected as participant feedback in-session and comments obtained within the post-intervention. Participants shared concern that xylazine use may be more prevalent in the service area as information contained in the intervention was consistent with clinical practice observations. Areas of continued interest were xylazine testing and improving protocols to identify and treat xylazine exposure, detox, and withdrawal. See Appendix E for post-intervention survey and results.

Summary

The results of this QI project illuminate and confirm clinician concern about the impact of substance use and xylazine exposure in the Veteran population. Participants response to pre- and post-intervention surveys aligned with the specific aim of increasing clinician awareness and preparedness to address xylazine exposures. Veterans are at an increased risk of SUDs and overdose and increasing

clinician awareness and preparedness through education may mitigate some inherent risks associated with substance use (Bennet et al., 2022, Phillips et al., 2023). The participants reported that xylazine education was important to the population of Veterans that they served and expressed interest in further education and the development of testing and protocols.

Interpretation

Participant responses to pre- and post-intervention survey and comments obtained during educational sessions and through survey feedback demonstrate clinician curiosity about xylazine. In the clinical setting of the Community Resources and Referral Center (CRRC) that serves Veterans with housing instability and higher rates of substance use, the educational materials illuminated a connection between what is being observed within the patient population and symptoms of xylazine exposure within this population. In the context of this setting, there was significant interest in how to obtain testing materials and increasing harm reduction strategies and patient education. In contrast, the PMHNP workgroup in the first PDSA cycle was made up primarily of clinicians working in an outpatient mental health setting, and while clinicians found the information informative, many did not find it particularly relevant to the Veterans they serve.

Consistent with research that focuses on identifying and treating xylazine exposure, harm reduction efforts on the part of clinicians exist and offer hope, but drug overdoses that involve xylazine continue to increase (Quijano et al., 2023). National organizations such as the Drug Enforcement Agency, Centers for Disease Control, and National Institute on Health offer xylazine educational materials to clinicians and the civilian population, but there is a deficit in understanding any measurable impact on patient care. The presence of xylazine as a drug adulterant places clinicians as first responders in an ever-changing illicit drug trade.

Limitations

The clinician report of benefit from this educational intervention does not illuminate any observable benefit or harm to the Veterans it was intended to benefit. Despite evidence that continuing education plays an important role in improving clinician performance and ensuring that patients receive relevant and quality care it can be challenging to measure benefit in the short-term following the delivery of continuing education (Phillips et al., 2023). This quality improvement and clinician education was limited to a small subset of VA clinicians with varying contact with Veterans who use substances. Survey data and clinician feedback highlight varying interest in xylazine and its relevance to patient care or clinic setting. Research into the effectiveness of continuing education highlights important factors such as relevance to practice, internal motivation to learn, and urgency of patient need. Continuing education is most valuable and impactful when clinicians are motivated by need and relevancy to the patients they serve (VanNieuwenborg et al., 2016).

This educational content was most valuable within the setting of the CRRC that serves a primarily houseless Veteran population in which rates of substance use are high. Clinicians within the outpatient mental health setting found value in the education but questioned its immediate relevance to their patient population.

Conclusion

As overdose deaths in the United States continue to rise at alarming rates, it is imperative that clinicians that treat people who use substances engage in continuing education to meet the demand for harm reduction and life saving strategies. This quality improvement education improved clinician awareness of xylazine with a particular focus on identifying xylazine exposure, treating wounds, withdrawal, toxicity, and providing harm reduction education to patients. Future endeavors to provide xylazine education are likely to be most beneficial to clinicians treating substance use as primary

concern, and could be valuable within the VA medication assisted treatment programs that specialize in treating patients that use illicit drugs.

Additional important next steps may include patient survey of xylazine awareness and exposure, improving access to xylazine testing, and the creation of clinical protocols for wound care and xylazine withdrawal.

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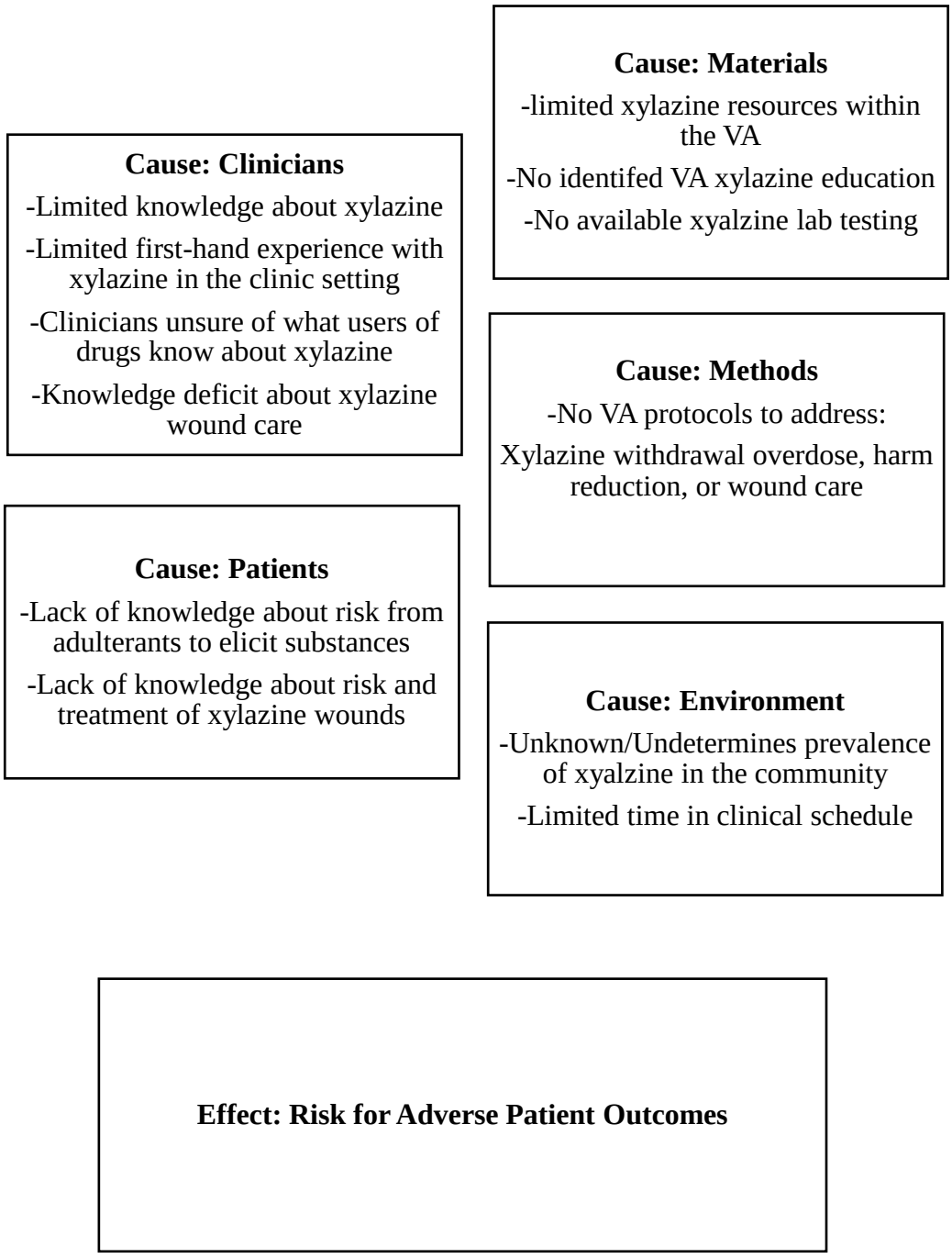
Appendix A: Cause and Effect Diagram



Appendix B: Project Timeline

Spring and Summer 2023:

- Interview VA clinicians to identify need and interest in xylazine education
- Data collection of all relevant xylazine information, research evidence, and known clinical protocols.
- Interviews with Veterans to obtain anecdotal information of xylazine presence in the community
- Attend formal VA xylazine training

Fall 2023:

- Continue regular research engine searches for emerging xylazine evidence
- Prepare educational content utilizing current and relevant xylazine knowledge
- Prepare pre- and post- intervention Likert-scale and multiple-choice surveys.
- Prepare intervention/educational content

December 2023:

PDSA Cycle 1:

- Present xylazine educational material to PMHNP workgroup (10-14 clinicians) leaving time for questions, ask participants to complete pre- and post-intervention survey.
- Provide pre- and post-intervention surveys, allowing for free text comments.

PDSA Cycle 2:

- Incorporate survey analysis and qualitative feedback into subsequent educational material and delivery format.
- Present educational material to clinicians at the VA Community Resource and Referral Center (12-20 clinicians) leaving time for questions, ask participants to complete pre- and post-intervention survey.
- Provide pre- and post-intervention surveys, allowing for free text comments.

Appendix C: Clinical Letter of Support and IRB Approval

Letter of Support from Clinical Agency

Date: *07/28/2023*

Dear *Christine Allen*

This letter confirms that I, *Julie Thompson,* allow *Christine Allen* (OHSU Doctor of Nursing Practice Student) access to complete his/her DNP Final Project at our clinical site. The project will take place from approximately *August 15, 2023,* to *March 1, 2024*.

This letter summarizes the core elements of the project proposal, already reviewed by the DNP Project Preceptor and clinical liaison (if applicable):

- **Project Site(s)**:
  -Vancouver VA, Substance Abuse Treatment Program (SATP) 1601 E Fourth Plain Vancouver, WA 98661
  -VA Community Resource and Referral Center (CRRC) 308 SW First Ave Portland, OR 97204
  -Portland VA Medical Center 3710 SW US Veterans Hospital Rd Portland, OR 97239

- **Project Plan: Use the following guidance to describe your project in a brief paragraph.**
  - Identified Clinical Problem: *Xylazine is non-opiate animal tranquilizer that is the most common adulterant added to illicit drugs and is increasingly linked to overdose deaths among people who use illicit drugs. The significant increase of xylazine's presence in the*
    U.S. illicit drug supply makes increasing knowledge an important issue facing clinicians and patients. The VA does not currently test for xylazine, nor does it have formal protocols for screening or treating Veterans who may be exposed to xylazine, either knowingly or unknowingly. Clinicians unfamiliar with xylazine may not recognize how xylazine impacts a person's symptoms which may result in inadequate care for physical and psychological drug effects. To date, there is limited data available to guide clinical decision making, particularly in the Portland metropolitan area where incidence of xylazine intoxication is largely unknown.
  - Rationale: *The Model for Improvement developed by the Institute for Healthcare Improvement (IHI) will be used as the framework for this improvement project. The IHI Model for Improvement is designed to support effective changes within healthcare systems and relies on small, yet rapid tests of change using the Plan-Do-Study-Act (PDSA) cycles). The utilization of PDSA cycles will allow members of the multidisciplinary team to evaluate and provide input into the impact of interventions provided within each PDSA cycle.*
  - Specific Aims: *The aim of this quality improvement project is to increase VA clinician knowledge and preparedness to treat xylazine exposure within the*

Veteran population served in the Portland metropolitan area by March 2023.

- Methods/Interventions/Measures: *The intervention in this project is to provide xylazine education to clinicians at the VA SATP and CRRC. The intervention will consist of a 5–7- minute PowerPoint of current xylazine data and clinical interventions to be presented at staff meetings and sent through electronic mail to appropriate staff within these departments. The primary outcome measure is to increase clinician knowledge and preparedness to address xylazine use in VA patients. The intervention will be evaluated through anonymous and de-identified pre- and post- surveys, as well as free text feedback provided through survey, and real-time feedback received in staff meetings.*
- Data Management: *All data responses to surveys and provided in free text or as in-person feedback, will be de-identified and managed in password protected online cloud storage.*
- Site(s) Support: *Julie Thompson of the Vancouver VA agrees to provide workspace to conduct project activities, assist in identifying employees who might qualify for inclusion, assist in distributing questionnaires via email lists, facilitate communication between departments and clinical sites as appropriate, facilitate conversation and dissemination of educational material in staff meetings, and assist with obtaining approval to post project information in staff common areas.*
- Other:

During the project implementation and evaluation, *Christine Allen* will provide regular updates and communicate any necessary changes to the DNP Project Preceptor.

Our organization looks forward to working with this student to complete their DNP project. If we have any concerns related to this project, we will contact *Christine Allen* and *Tara O'Connor* (student's DNP Project Chairperson).

Regards,
_Dr. Julie Thompson DNP,FNP-C, PMHNP-BC

DNP Project Preceptor (Name, Job Title, Email, Phone):_PMHNP ADDICTION PSYCHIATRY AND MENTAL HEALTH

Signature

8/2/23

Date Sign

Appendix C (Continued) Clinical Letter of Support and IRB Approvals

IRB MEMO

Research Integrity Office
3181 SW Sam Jackson Park Road - L106RI
Portland, OR 97239-3098
(503)494-7887 irb@ohsu.edu

NOT HUMAN RESEARCH

Dear Investigator:

On 9/18/2023, the IRB reviewed the following submission:

Title of Study:	Improving Clinician Preparedness to Address Xylazine Use Within the Veteran Population: A Quality Improvement Project
Investigator:	Tara O'Connor
IRB ID:	STUDY00026270
Funding:	None

The IRB determined that the proposed activity is not research involving human subjects. IRB review and approval is not required.

Certain changes to the research plan may affect this determination. Contact the IRB Office if your project changes and you have questions regarding the need for IRB oversight.

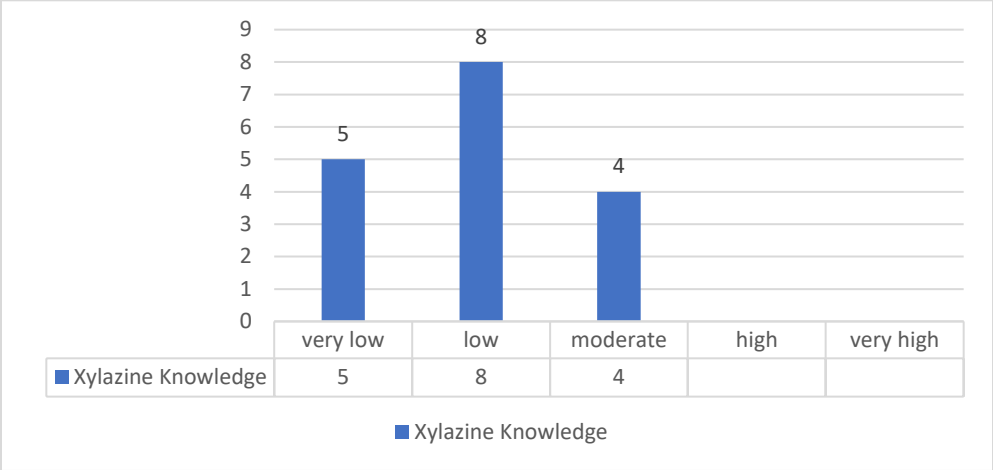
If this project involves the collection, use, or disclosure of Protected Health Information (PHI), you must comply with all applicable requirements under HIPAA. See the HIPAA and Research website and the Information Privacy and Security website for more information.

Sincerely,

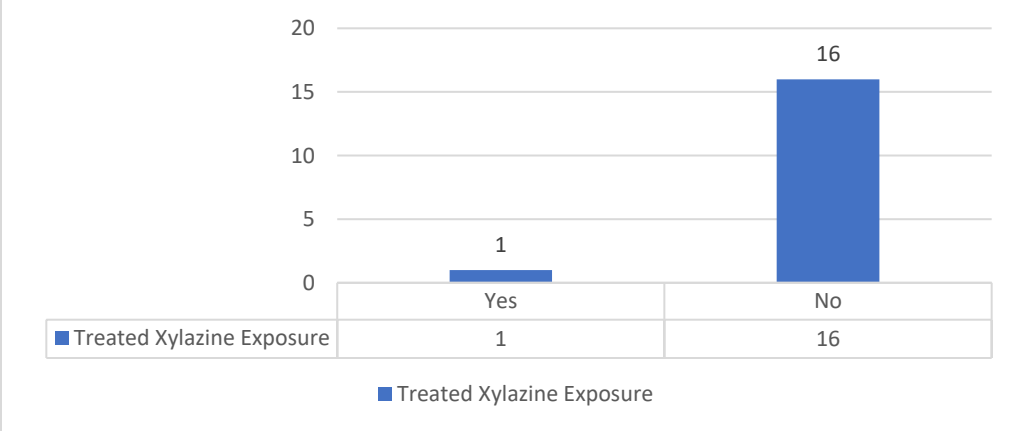
The OHSU IRB Office

Appendix D: Pre-intervention Survey and Results

Question 1: What is your current level of knowledge about xylazine?

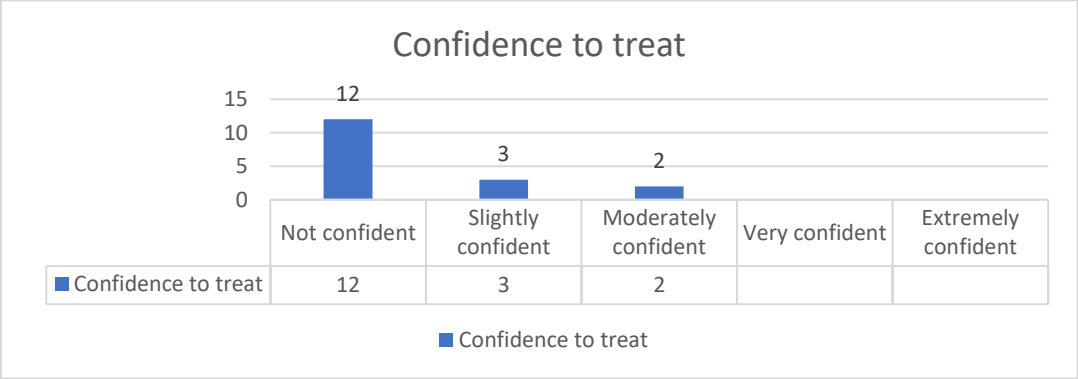


Question 2: Have you ever treated a patient exposed to xylazine?

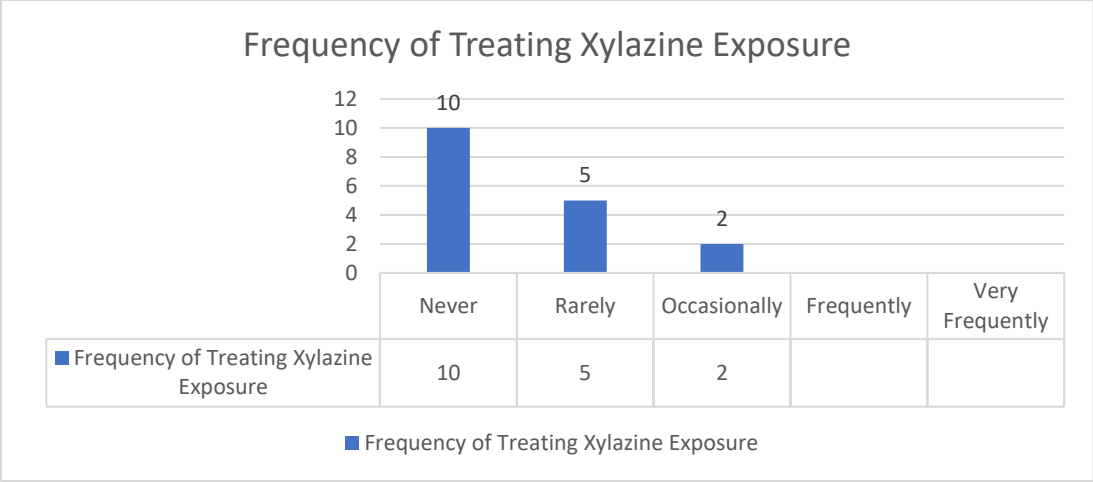


Appendix D (Continued): Pre-Intervention Survey and Results

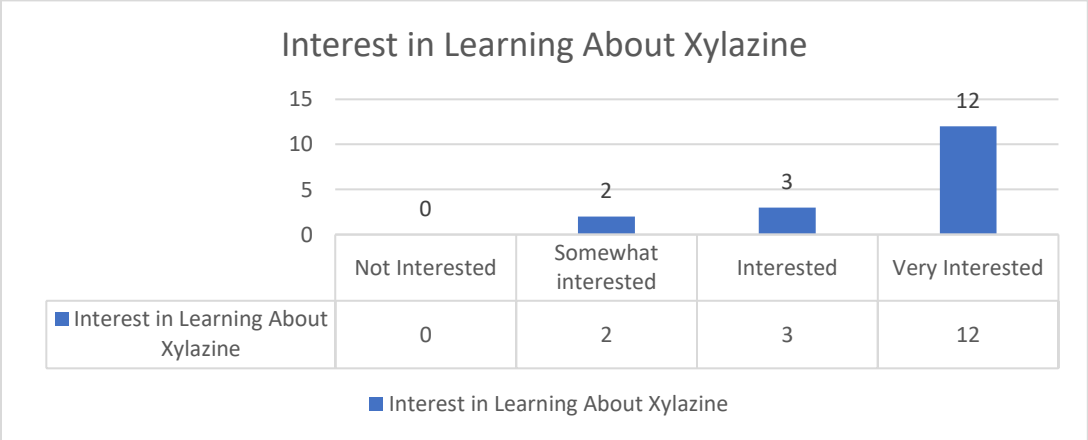
Question 3: How confident do you feel in your ability to treat xylazine exposure?



Question 4: How often do you encounter xylazine in your practice?

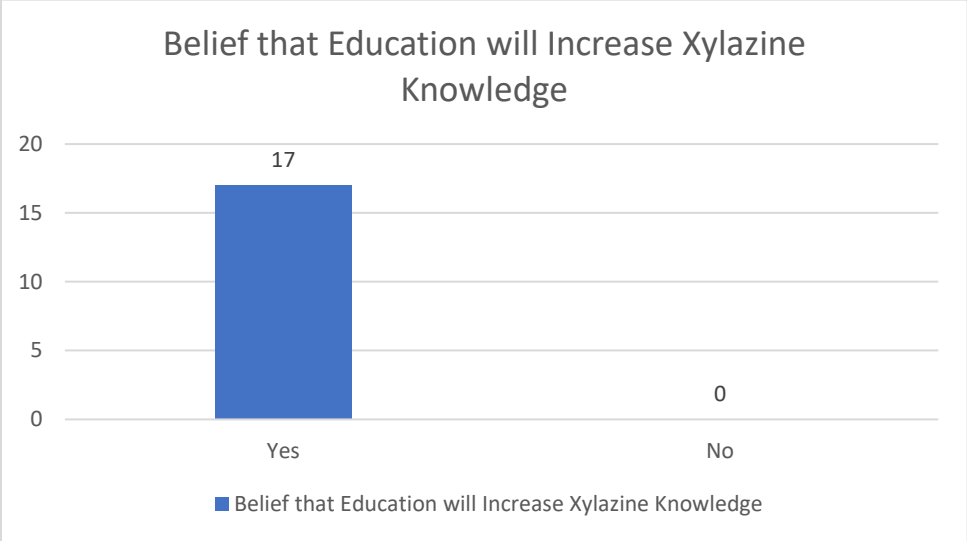


Question 5: How interested are you in learning more about xylazine?

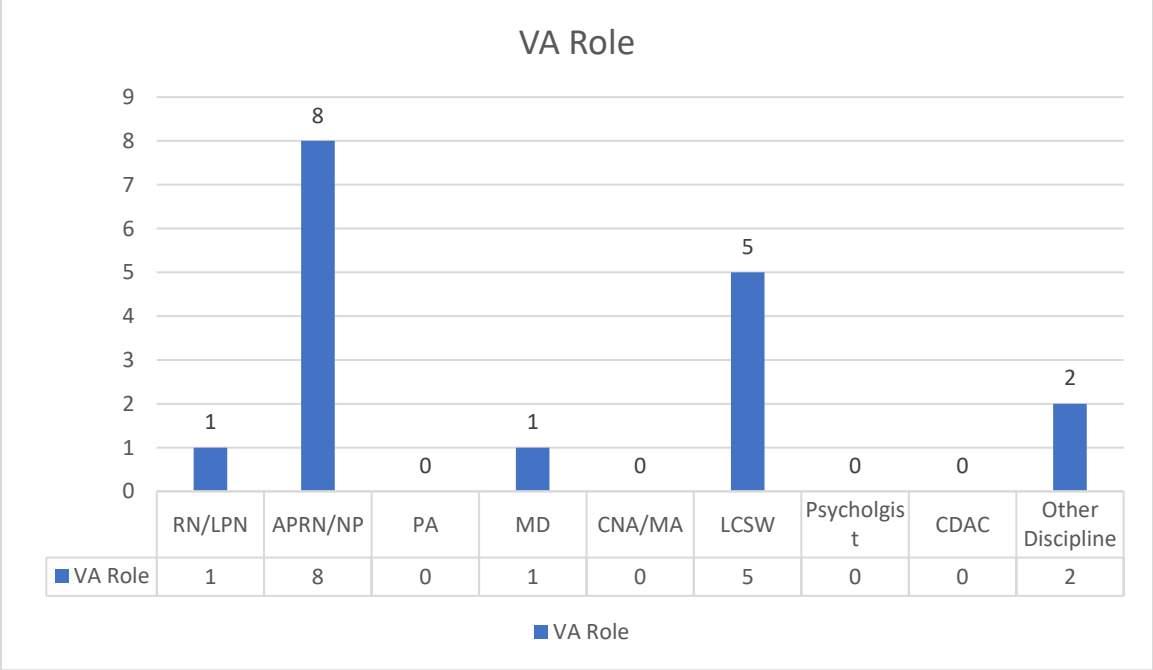


Appendix D (Continued): Pre-intervention Survey and Results

Question 6: Do you believe that the xylazine education will increase your knowledge about xylazine?



Question 7: What is your role within the VA?



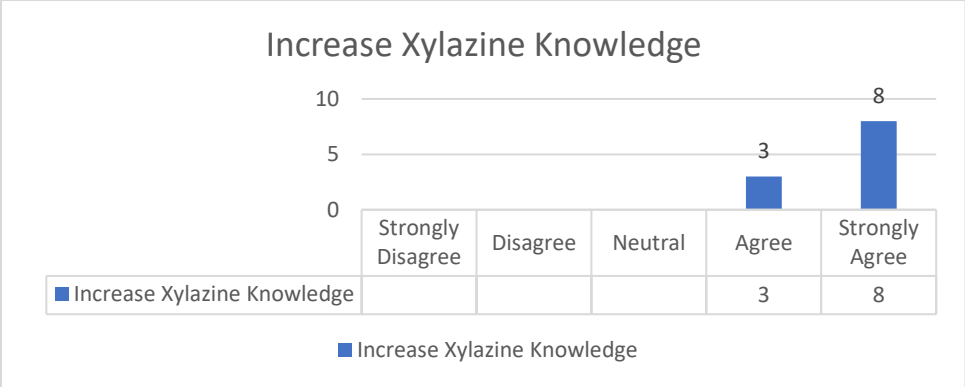
Appendix D (Continued): Pre-Intervention Survey and Results

Question 8: What are you hoping to learn about xylazine

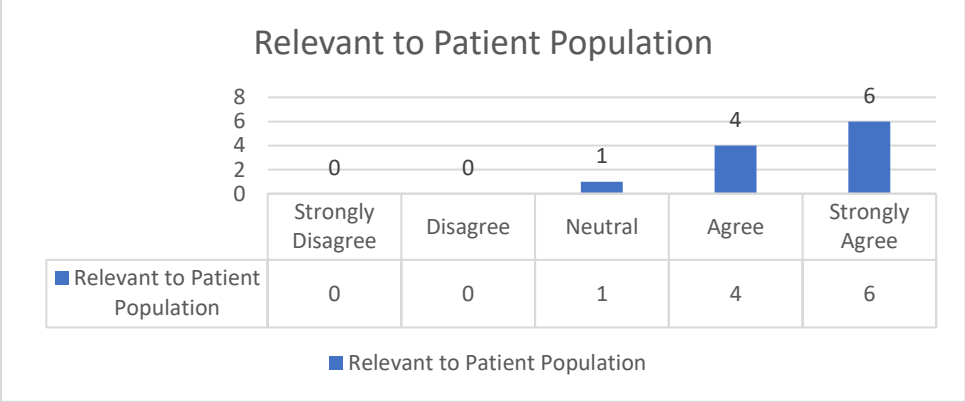
Participant Reponses: 14 of 17 pre-intervention survey participants responded to question 8.
"More about symptoms to look for and any emergency interventions to know about."
"Diagnosis and treatment"
"Treatment and detox implications"
"How to screen for use, how to provide basic education to patients re: safety/harm reduction, implications for detox/treatment referrals"
"Everything and anything"
"Everything. I have not had exposure to this substance and am excited for this opportunity to learn more."
"Treatment for exposure"
"Impact on mental health and treatment options"
"Treatment of withdrawal specifically pharmacological interventions when compared to opioids and fentanyl. Also, what is the protocol for opioid replacement when associated with xylazine"
"Risks, benefits, important factors to consider. More about it in general!"
"How commonly is it being used? What are the primary populations? Why is it being used?"
"Everything I can. I don't know, what I don't know."
"Treatment implications"
"Best practice for evidence-based treatment and supportive care."

Appendix E: Post-Intervention Survey and Results

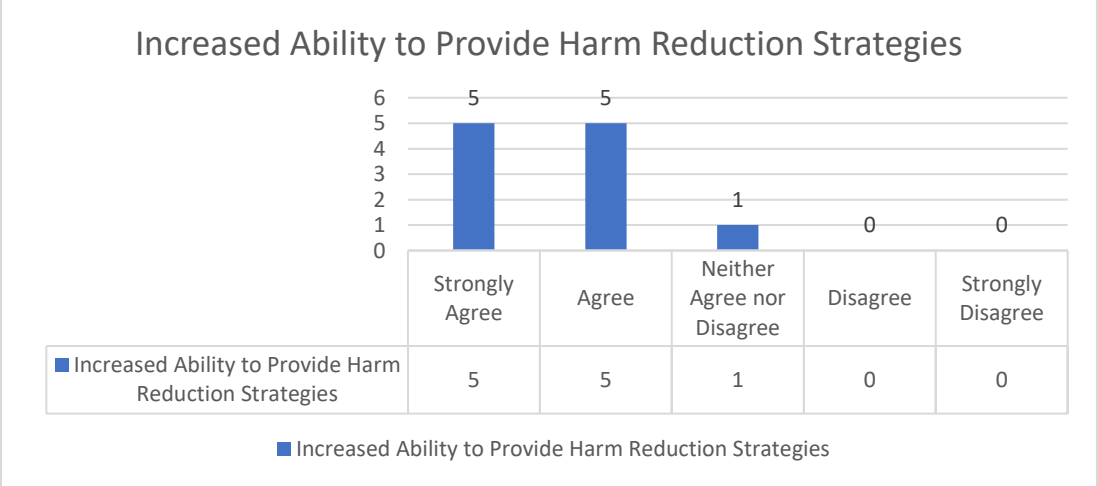
Question 1: The xylazine education increased my knowledge about xylazine.



Question 2: The xylazine education is relevant to my patient population

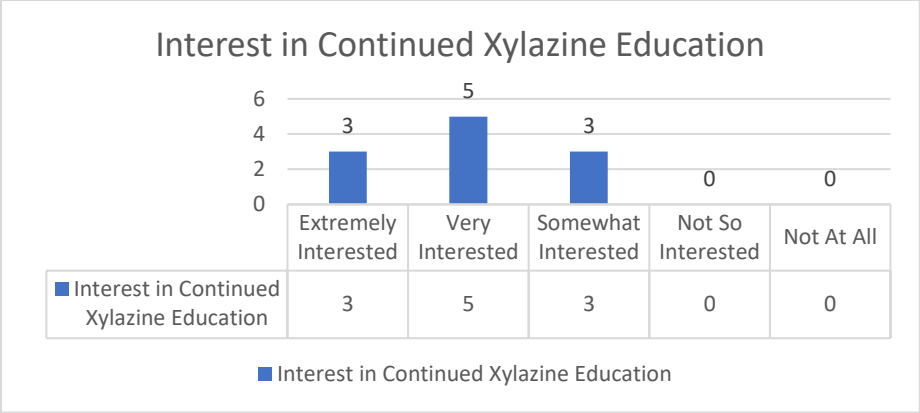


Question 3: The xylazine education increased my ability to provide harm reduction education to patients.



Appendix E (Continued): Post-Intervention Survey and Results

Question 4: I am interested in learning more about xylazine.



Question 5: Please provide any additional feedback about the information presented and/or quality and effectiveness of the presentation.

Participant Responses: 7 of 11 post-intervention survey participants responded to question 5.
"Based on certain symptoms, I am wondering if the rates are slightly higher. Some of these symptoms are familiar with my clients (skin conditions where I might consider meth mites or something similar)."
"Very information presentation. Thank you."
"Very accessible and presented to braid audience! Relevant, helpful, concise. Great job. Thank you!"
"Really excellent presentation! I learned quite a bit and hadn't realized what a big issue this had become in addition to fentanyl."
"Excellent, well-researched presentation."
"Great job!"
"Great presentation, very informative; content not very relevant for BHIP level of care, but nevertheless very useful information given ongoing drug use epidemic, with emerging substances and combinations"