

EDUCATION ON NALOXONE NASAL SPRAY TREATMENT FOR  
BAYLESS INTEGRATED HEALTH CENTER

by  
Mercy Omijie

---

Copyright © Mercy Omijie 2020

A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

2020

THE UNIVERSITY OF ARIZONA  
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Mercy Omijie, titled Education on Naloxone Nasal Spray Treatment for Bayless Integrated Health Center and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

*Michelle Kahn-John*

Michelle Kahn-John, PhD, RN, PMHNP-BC, GNP

Date: Nov 18, 2020

*Shawn Patrick Gallagher*

Shawn Patrick Gallagher, PhD, PMHCNS-BC, APRN-BC, FNP-BC

Date: Nov 18, 2020

*Heather L. Carlisle*

Heather L. Carlisle, PhD, DNP, RN, FNP, AGACNP, CHPN

Date: Nov 18, 2020

Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

*Michelle Kahn-John*

Michelle Kahn-John, PhD, RN, PMHNP-BC, GNP  
DNP Project Committee Chair  
College of Nursing

Date: Nov 18, 2020



ARIZONA

## ACKNOWLEDGMENTS

On the recollections of so many blessings and favors, I am very grateful to God almighty for allowing this doctoral journey and project to be possible. I want to express my sincere gratitude to the following people who supported and helped contribute to this project's success.

**Dr. Michelle Kahn-John**, I am so privileged to have you as my committee chair, advisor, and clinical supervisor. Thank you so much for your abundance of support, guidance, supervision, and valuable suggestions throughout this project and my doctoral journey.

**Dr. Gallagher and Dr. Heather**, I am so honored to have you both as my committee members. Thank you both for your supports and encouragement throughout the project.

My clinical preceptor at Bayless Clinic, **Dr. Fong Luis**, for your relentless support and strengthening my skills to succeed in targeted areas.

To all my professors and their support in providing the necessary materials needed to complete this project and to the University of Arizona for enabling me to pursue my dreams and complete my study here.

## DEDICATION

This project is dedicated to my family, parents Mr. John and Mrs. Julie Omijie, my daughter Skye Evie and my siblings for their support, tolerance, and source of inspiration to pursue my dream. I will forever appreciate all the persistent prayers and abundant showers of support during my doctoral journey.

To my course mates, Meta, Alzetta, and Tommie, who have become lifelong friends and supported me throughout this process. I am forever grateful for the shared commitment.

To my best friends, Ikemefuna and Adaeze, who offered me unwavering altruistic support and cheered me when discouraged throughout this journey.

To the opioid overdose epidemic, those who have lost loved ones to overdose and to preventing opioid overdose deaths across all communities.

## TABLE OF CONTENTS

LIST OF FIGURES .....	8
LIST OF TABLES .....	9
ABSTRACT .....	10
INTRODUCTION.....	12
<b>Background Knowledge and Significance .....</b>	<b>13</b>
<b>Opioid Overdose.....</b>	<b>14</b>
<b>Naloxone Emergency Treatment .....</b>	<b>15</b>
<b>Opioid Overdose Prevention.....</b>	<b>17</b>
<b>Primary Prevention Strategies.....</b>	<b>17</b>
<b>Improving Access to Effective Treatment .....</b>	<b>18</b>
<b>Harm Reduction Strategies.....</b>	<b>18</b>
<b>Harm Reduction Legislation Program.....</b>	<b>19</b>
<b>Perceived Barriers to Naloxone Distribution .....</b>	<b>21</b>
<b>Local Problem .....</b>	<b>22</b>
<b>Intended Improvement.....</b>	<b>22</b>
<b>Project Purpose .....</b>	<b>23</b>
<b>Project Question.....</b>	<b>24</b>
<b>Project Objectives .....</b>	<b>24</b>
<b>Theoretical Framework.....</b>	<b>25</b>
<b>Health Belief Model .....</b>	<b>26</b>
<b>Diffusion of Innovation Theory (DOI) .....</b>	<b>28</b>
<b>Literature Synthesis.....</b>	<b>31</b>
<b>Evidence Search .....</b>	<b>31</b>
<b>Comprehensive Appraisal of Evidence .....</b>	<b>33</b>
<b>Naloxone Reverses Opioid Overdose .....</b>	<b>34</b>
<b>Effect of Education on Comfort, Attitude and Readiness Level .....</b>	<b>35</b>
<b>Effects of Educational Intervention on Knowledge .....</b>	<b>36</b>
<b>Strengths of Evidence .....</b>	<b>37</b>

## TABLE OF CONTENTS – Continued27

<b>Weaknesses of Evidence</b> .....	39
<b>Gaps and Limitations</b> .....	40
<b>METHODS</b> .....	41
<b>Project Design</b> .....	41
<b>Model for Implementation</b> .....	42
<b>Plan</b> .....	44
<b>Do</b> .....	44
<b>Study</b> .....	45
<b>Act</b> .....	46
<b>Setting and Stakeholders</b> .....	47
<b>Planning the Intervention</b> .....	49
<b>Inter-Professional Collaboration</b> .....	49
<b>Organization Approval Process</b> .....	50
<b>Materials Needed for the Project</b> .....	50
<b>Participants and Recruitment</b> .....	51
<b>Recruitment and Step-by-Step Procedures</b> .....	52
<b>Consent and Ethical Considerations</b> .....	54
<b>Respect for Person and Consent</b> .....	54
<b>Beneficence</b> .....	55
<b>Justice</b> .....	56
<b>Institutional Review Board (IRB) Approval</b> .....	56
<b>Data Collection</b> .....	57
<b>The OOKS</b> .....	58
<b>The OOAS</b> .....	58
<b>Demographics</b> .....	59
<b>Data Analysis</b> .....	59
<b>RESULTS</b> .....	60
<b>Findings</b> .....	60

## TABLE OF CONTENTS - Continued

<b>Participants</b> .....	61
<b>Findings from the OOKS Survey</b> .....	62
<b>Findings from the OOAS Survey</b> .....	63
<b>Scholarly Project Evaluation and Outcomes</b> .....	67
<b>DISCUSSION</b> .....	68
<b>Summary</b> .....	68
<b>Interpretation</b> .....	70
<b>Comparison of Findings to Framework</b> .....	71
<b>Comparison of Findings to Literature</b> .....	72
<b>Implications</b> .....	72
<b>Limitations and Project Barriers</b> .....	74
<b>The Impact of COVID-19 on this Quality Improvement Project</b> .....	76
<b>DNP Essentials Addressed</b> .....	77
<b>Conclusions</b> .....	79
<b>Plan for Sustainability</b> .....	79
<b>Plan for Dissemination</b> .....	80
<b>APPENDIX A: BAYLESS INTEGRATED HEALTHCARE SITE APPROVAL/THE INSTITUTIONAL REVIEW BOARD LETTER</b> .....	81
<b>APPENDIX B: CONSENT DOCUMENT (DISCLOSURE FORM)</b> .....	84
<b>APPENDIX C: RECRUITMENT MATERIAL (RECRUITMENT FLYER)</b> .....	86
<b>APPENDIX D: EVALUATION INSTRUMENTS (APPROVAL TO USE OOKS INSTRUMENT AND OOAS SCALE INSTRUMENTS/PRETEST QUESTIONNAIRE/PRETEST SURVEY/POSTTEST SURVEY)</b> .....	88
<b>APPENDIX E: PARTICIPANT MATERIAL (POWERPOINT PRESENTATION/PRESENTATION POSTER)</b> .....	98
<b>APPENDIX F: PROJECT TIMELINE</b> .....	109
<b>APPENDIX G: LITERATURE REVIEW GRID</b> .....	112
<b>REFERENCES</b> .....	118

## LIST OF FIGURE

<b>Figure 1</b>	<i>Health Belief Model (HBM) Illustration</i> .....	28
<b>Figure 2</b>	<i>Diffusion of Innovation (DOI) Characteristics Illustration</i> .....	30
<b>Figure 3</b>	<i>Literature Review Strategies PRISMA Flow Diagram</i> .....	33
<b>Figure 4</b>	<i>Plan-Do-Study-Act (PDSA) Cycle</i> .....	47

## LIST OF TABLES

<b>Table 1</b>	<i>Evidence Level of Hierarchy Illustration</i> .....	39
<b>Table 2</b>	<i>Outline of the Asynchronized Training and Pre- and Post-surveys</i> .....	54
<b>Table 3</b>	<i>Outline of Participants Demographic Information</i> .....	62
<b>Table 4</b>	<i>Responses of the OOKS Pre- and Post-surveys</i> .....	63
<b>Table 5</b>	<i>Responses of the OOAS Pre- and Post-surveys</i> .....	66

## ABSTRACT

**Purpose:** The primary purpose of this quality improvement project was intended to provide clinical providers and nonclinical staff at Bayless Integrated Healthcare Center targeted education and training on administering naloxone nasal spray as well as increase their baseline knowledge, comfort, attitude, and readiness to use naloxone nasal spray in the treatment of opioid overdose.

**Background:** Opioid overdose crisis continues to be a significant public health concern that requires a harm reduction approach including naloxone distributions, increasing bystander education and involvement on naloxone use to mitigate opioid overdose deaths, improve the quality of the public's health as well as social and economic welfare in the US communities.

**Method:** This quantitative, descriptive quality improvement project delivered an evidence-based education intervention via asynchronized learning to staff and providers at a local clinical setting. The educational intervention presented information on opioid overdose risk, recognition of an individual experiencing opioid overdose symptoms, and using the naloxone nasal spray kit to reverse the effects of overdose. Pre- and post-surveys were used to evaluate the impact of the educational intervention on pre- and post-differences in knowledge, comfort, attitude, and readiness to intervene. The self-administered opioid overdose knowledge scale and opioid overdose attitude scale was used to evaluate pre- and post-participant responses.

**Result:** Pre- and post-surveys were analyzed using a cumulative percentage and mean average scores. Seven (N=7) clinical and nonclinical staff participated and completed the education intervention. Comparison of pre- and post-survey results indicated an increase in participants'

knowledge (+7% gain) and increase in participants comfort, attitude, and readiness to use naloxone nasal spray to treat opioid overdose (mean average +0.89 increase).

**Conclusion:** The delivery of educational interventions to clinical and nonclinical increased participant knowledge, comfort, attitude, and readiness to intervene in the treatment of opioid overdose using Naloxone nasal spray. It is critical to close that knowledge gap, reduce stigma, and improve attitudes among the clinical providers and nonclinical staff on the use of naloxone nasal spray in the treatment of opioid overdose. Finally, with the ongoing opioid overdose crisis, the education intervention provided the staff opportunity and hope for all those 34-43 millions of Americans that continue to misuse opioids and provided harm reduction measures to mitigate OOD fatalities in the US community.

## INTRODUCTION

Opioid overdose (OOD) epidemic continues to be a significant public health concern throughout the United States (US), including in the state of Arizona where the likelihood of accidentally dying from overdose surpass those dying in vehicle accidents (Centers for Disease Control and Prevention [CDC], 2018a; Arizona Department of Transportation [AZDOT], 2018). Between 1999 to 2018, drug overdose quadrupled and has accounted for over 450,000 deaths (CDC, 2018a). In 2018, about 67,367 overdose deaths occurred with 70% involving both illicit and prescription opioids (CDC, 2018a). The misuses and abuse of opioids was linked to a two-year decline in life expectancy in the US (Baldwin et al., 2018). With more people struggling with opioids and overdose, how do nurse practitioners become involved in an effort to address the opioid overdose epidemic?

Translating new knowledge to clinical practice is crucial for effective, transparent, safe, and efficient healthcare delivery that can be delivered in the clinical setting and in the community setting (Curtis et al., 2017). Despite the importance of knowledge translation, evaluating the research, and successful dissemination to clinical practice is challenging (Curtis et al., 2017). It can take several years before research based clinical recommendations and practice guidelines are implemented in clinical practice. In a study conducted by Cicero and Ellis (2017), the authors note that education for healthcare providers is critical for addressing, targeting, and decreasing the opioid overdose epidemic. The educational effort in this quality improvement (QI) project designed for health care professionals will enhance their ability to become more aware of the negative health related impacts of opioid overdose while introducing them to

effective practice knowledge which may in turn impact and transform policy or future research (Curtis et al., 2017).

### **Background Knowledge and Significance**

Around the timeframe of 2015, opioid pain reliever (OPR) use in the US skyrocketed (Kolodny et al., 2015). The consumption of OPR like hydrocodone and oxycodone increased more than double, and by nearly 500% (Kolodny et al., 2015). According to the CDC, the exponential increase in OPR use led to the most horrendous drug overdose epidemic in the history of the US (Kolodny et al., 2015). More recently, data has shown opioid overdose claims at least 128 lives in the US each day, including two lives daily in the State of Arizona (AZDHS, 2019a; National Institute of Drug Abuse [NIDA], 2020). From 1999-2018, almost 450,000 died from an overdose related to opioid use, including the use of illicit and prescriptions relievers (CDC, 2020a). Given the implication of these ongoing problems, the CDC included OOD prevention as one of their highest public health priorities (CDC, 2020a).

There are three reported causative factors to the rise of OOD deaths. The first factor began with healthcare providers overprescribing opiate medication (Kolodny et al., 2015). For instance, about 168 million opiate prescriptions were written by healthcare providers in 2018, and that equated to every American having a bottle of opiate pills (CDC, 2020). The second factor is the relationship between OPRs and heroin use (NIDA, 2020). In 2018, it was reported that an estimate of 35 to 43 million people in America misused prescription OPRs, while 80% transitioned to Heroin by 2019 (NIDA, 2020). A study conducted by Thompson (2014), examined the relationship between OPRs and abuse of heroin. The author pointed out that heroin was often used because it was easily accessible and less costly than opioid prescriptions

(Thompson, 2014). Lastly, the third cause of the rise of the OOD deaths was because many began using synthetic opioids in 2013, particularly illicit fentanyl – a combination of heroin, cocaine, and various counterfeit pill formulas (CDC, 2020). Regrettably, as the market for manufactured illicit fentanyl increased, the OOD began to significantly impact individuals and families detrimentally by deflating the quality of life in all communities’ in the US, and worldwide (CDC, 2020; Green & Doe-Simkinsc, 2016; NIDA, 2019b).

### **Opioid Overdose**

Opioids are a class of drugs used for pain management (Hawk et al., 2015). They are accessed legally by prescription or illicitly (Hawk et al., 2015). Despite whether lawfully prescribed or illicit, the mechanism of action and pathophysiology is the same (Hawk et al., 2015). Opioids primarily affect the region of pain by binding to opioid receptors in the pain pathway within the spinal cord and brain (Hawk et al., 2015). They can also attach to the dopaminergic path of the brain and produce an intense euphoric and rewarding effect in the brain (Hawk et al., 2015). Opioid overdose is caused by the misuse of prescription opioids or illicit drugs (heroin, fentanyl) (Hawk et al., 2015). In a state of opioid overdose, respiratory depression can occur in which adequate oxygenation is limited to the heart and brain (Hawk et al., 2015). The hypoxia that occurs with opioid overdose can result in anoxia, unresponsiveness, and death (Hawk et al., 2015). This respiratory depression is reversible with early recognition and intervention however, if left untreated respiratory depression can last 1 to 3 hours, ultimately resulting in death (Hawk et al., 2015).

## **Naloxone Emergency Treatment**

Opioid overdose leads to death when too much of the drug overpowers the brain and stops the individual from breathing (Substance Abuse and Mental Health Services Administration [SAMHSA], 2019). One aspect of a novel preventative initiative is the use of the naloxone, a lifesaving medication that blocks the effects of OOD related respiratory distress and quickly restores normal breathing in a person overdosing on opioids (NIDA, 2019c; Phillips et al., 2017). Though naloxone reverses the effects of OOD, it has no effects on a person who has no opioids in their system, and it is not a treatment for opioid use disorder (OUD) (NIDA, 2019c). Examples of opioids include morphine, codeine, oxycodone, fentanyl, and heroin (NIDA, 2019c). Naloxone has been approved by the United States Food and Drug Administration (FDA) for delivery in three different formulations: prepackaged nasal spray, injectable, and auto-injectable (NIDA, 2019c). The injectable naloxone is mostly administered by medical professionals, while the nasal spray and auto-injector forms are delivered by nonmedical professionals in emergency situations, such as in the community or in the home (NIDA, 2019c). In the wake of the OOD epidemic, naloxone nasal spray (NNS) was developed in the 1990s in an effort to make OOD reversal treatment more accessible and readily available in an emergency (FDA, 2018; McDonald et al., 2017). The NNS is approved for the use in adults and children and can be easily administered by nonmedical professionals, including first responders (emergency medical services, law enforcement) bystanders or layperson, family members, caregivers, or friends in the community or in the home (FDA, 2018). The NNS recommended dosage comes in the form of a pre-filled 4mg strength needle free device and is sprayed into one nostril for reversal of a suspected or known opioid overdose (FDA, 2018).

Given that NNS is needle free, it may be preferred over injections because there are fewer associated needle stick injuries and bypasses the difficulty accessing the fragile often inaccessible veins of long-term injection drug users (McDonald et al., 2017). The NNS, compared to the injections, can be administered by a layperson, allowing for rapid opioid overdose reversal. In a randomized clinical trial study, McDonald et al. (2017) evaluated the pharmacokinetic (PK) profiles of NNS and compared the bioavailability and early systemic exposure with NNS to naloxone injections (McDonald et al., 2017). Three doses of NNS (1mg, 2mg, & 4mg) were compared to 0.4mg intravenous (i.v.) naloxone and 0.4mg intramuscular (i.m.) naloxone. The findings showed that all three nasal spray doses (1mg, 2g, 4mg) rapidly achieved systematic effects within 10 minutes and were most similar to 0.4mg (i.m.) naloxone (McDonald et al., 2017). A repeated dose of 2mg nasal spray at three minutes intervals compared to 0.4mg (i.m.) naloxone also had similar systematic effects post dosing (McDonald et al., 2017). Though both nasal spray doses and i.m. doses were relatively similar; the authors further revealed that the 2mg nasal spray doses maintained twice the plasma level for two hours compared to i.m. naloxone (McDonald et al., 2017). A second study conducted by Krieter et al. (2019) compared the PK of two NNS doses (2mg, 4mg) versus a 2mg dose of i.m. naloxone for suspected opioid overdose emergency treatment. The authors revealed that both the 2mg and 4mg NNS dosing achieved its highest exposure effects after only five minutes post dosing and was comparable to 2mg i.m. naloxone dosing (Krieter et al., 2019). Repeated NNS doses (2x2mg, 4x4mg) delivered at two-minute intervals had similar effects post dosing (Krieter et al., 2019). Overall, both studies' findings indicate the effectiveness of NNS for OOD reversal emergency treatment (Krieter et al., 2019; McDonald et al., 2017). Studies demonstrate the NNS

systemic reversal effects can be seen within 5 to 10 minutes (Krieter et al., 2019; McDonald et al., 2017). Repeated doses of NNS may be required at 2 to 3 minutes intervals to achieve the maximal effect (Krieter et al., 2019; McDonald et al., 2017).

### **Opioid Overdose Prevention**

The opioid epidemic has significantly impacted individuals detrimentally across all the communities in the US (Hawk et al., 2015). It has garnered the attention of policymakers, many healthcare professionals, public health officials, and harm reduction organizations (Hawk et al., 2015). There have been several strategies to decrease fatal OOD, most of which fall into three broad categories: 1) primary prevention strategies; 2) improving access to effective treatment; and 3) harm reduction strategies, including expanding naloxone distribution programs and legislation to increase medical personnel and bystander involvement during an overdose (Hawk et al., 2015). Though each strategy on its own may be important, effectively synchronizing these efforts is necessary for reducing the number of individuals and communities damaged by the severity of OOD (Hawk et al., 2015).

### **Primary Prevention Strategies**

Reducing the number of fatal OOD is an intuitively logical strategy in fighting the opioid epidemic. Many of the current strategies used a varying approach, but all are designed to counter the effects of fatal OOD (Hawk et al., 2015). The primary prevention programs focus on educational intervention for high-risk individuals, safely disposing of opioids, the importance of not sharing prescriptions, increasing provider's use of prescription monitoring programs, urine drug testing, pain contracts, and increasing access to pain experts (Hawk et al., 2015). Other initiatives encourage community-based campaigns with a goal to raise awareness of community-

based interventions. One such community-based intervention is the development of opioid overdose naloxone kits designed to be used by family members, laypersons, and healthcare workers to help prevent and manage fatal OOD among those at highest risk (Hawk et al., 2015).

### **Improving Access to Effective Treatment**

Another fundamental method to mitigate the burden of the OOD epidemic is to ensure access to effective treatment (Hawk et al., 2015). An established strategy, such as medication-assisted treatment (MAT), combines behavioral therapy and medications like buprenorphine or methadone to treat individuals with opioid addiction (Hawk et al., 2015). Other effective treatments include brief negotiation interview (BNI) and screening brief intervention and referral to treatment (SBIRT) (Hawk et al., 2015). Both the BNI and SBIRT are comprehensive screening programs that help identify the severity of substance use while delivering early intervention and referral to treatment (Hawk et al., 2015). The United States Department of Health and Human Services (USDHHS) recognizes the naloxone distribution program as one of the top approaches for combating the OOD epidemic (Hawk et al., 2015).

### **Harm Reduction Strategies**

In response to the OOD crisis, the alignment of public health officials, community organizations, healthcare professionals, and legislators has led to the exponential increase in harm reduction strategies to reduce the number of fatal OOD (Hawk et al., 2015). The harm reduction is a set of useful approaches, policies, and programs focused on reducing the negative consequences associated with drug use (Hawk et al., 2015). There are numerous opportunities to reduce the fatality associated with opioid misuse and dependence, including targeted overdose education, naloxone distribution, and policies to increase medical personnel and bystanders'

involvement during an opioid overdose (Hawk et al., 2015). The Substance Abuse and Mental Health Service Administration (SAMHSA) published an opioid overdose toolkit with target overdose education for patients, family and community members, first responders, and prescribers (Hawk et al., 2015). Other programs, such as the Harm Reduction Coalition (HRC), including the Office of National Drug Control Policy (ONDCP), support increasing access to naloxone distribution (Hawk et al., 2015). Advocates also urged the Food and Drug Administration (FDA) to monitor the naloxone supply and cost variations, including considering alternative naloxone formulations and distribution paradigms to meet the demands associated with the high rates of OOD (Hawk et al., 2015). Despite their ability to improve health and social outcomes, many of these interventions for OOD remain underutilized. Underutilization is induced by policy and regulatory barriers (Lambdin et al., 2018). There are regulatory barriers that place limits on naloxone administration (Lambdin et al., 2018). A person overdosing on opioids is physiologically disabled during an overdose episode and cannot self-administer naloxone; therefore, there must be someone nearby to administer it. Naloxone administration also requires a prescription in some states; therefore, bystanders may face potential legal sanctions for accessing and administering naloxone (Lambdin et al., 2018). Effectiveness of treatment and educational initiatives must be evaluated and modified to foster legislation that supports current practices such as access to naloxone by community members and bystanders so they may intervene in an emergency response to OOD.

### **Harm Reduction Legislation Program**

In the US, policy reformers associated with the FDA and ONDCP have played a significant role in supporting and promoting harm reduction strategies as an alternative response

to combating the OOD epidemic (Gabay, 2016; Nadelmann & LaSalle, 2017). The majority of the states have taken actions to address the OOD epidemic including: increasing naloxone access in the community, pharmacy setting and advocating for access to naloxone by third-party bystanders (family, caregiver, friend), and finally the provision of specific legal protections for nonmedical professionals (laypersons) that allows them to possess and administer naloxone without a prescription (Gabay, 2016; Nadelmann & LaSalle, 2017). Almost every state in the US has passed policy intended to increase access to naloxone treatment, including 44 states where pharmacies have the permission to offer naloxone without a prescription, and 36 states have passed an overdose “Good Samaritan” law for someone suffering from OOD (Nadelmann & LaSalle, 2017). The Good Samaritan laws at the state level provide criminal, civil, and disciplinary immunity for the prescriber and dispenser. In addition, immunity is offered to individuals who call 911, individuals who may also possess drugs at the time of the call (Gabay, 2016; Nadelmann & LaSalle, 2017). The state of Arizona holds a Good Samaritan law that generally provides immunity from professional liability and criminal prosecution to anyone or emergency medical technicians (EMT), law enforcement, and peace officers who administer naloxone to a person with suspected OOD in good faith (AZDHS, 2017). Currently, the Arizona statute 32-17979 allows pharmacists to dispense naloxone with a prescription (Arizona State Board of Pharmacy [AZSBP], 2016). Further, under the AZ statute 36-2266, health professionals can prescribe naloxone to a person at risk of OOD, family members of that person, to a community organization that provides services to individuals at risk, or any individual in a position to assist a person at risk for OOD (AZDHS, 2017).

### **Perceived Barriers to Naloxone Distribution**

Naloxone administration for the reversal of OOD has been shown to be effective in many delivery models and settings (Bessen et al., 2019). Several studies indicate some opposition to the acceptability of naloxone harm reduction efforts. One study examined emergency responders on their perception of opioid overdose and NNS treatment. The researchers revealed that the emergency responders expressed uncertainty and were concerned that increased availability of naloxone fails to address the underlying cause of opioid addiction and may enable increases in risky behaviors among individuals who use opioids (Bessen et al., 2019). This finding is consistent among other similar studies. The Haug et al. (2016) study revealed that many providers had mixed opinions and expressed beliefs that naloxone does not address the OOD crisis, despite knowing the efficacy of naloxone in OOD management. In the Drainoni et al. (2016) study, many of the participants (emergency department staff) felt that naloxone should be distributed to those who are “worthy,” despite their medical understanding of opioid addiction. That study reminds us how stigma about substance use disorder can create bias that may impact clinical decisions to offer an evidence based intervention for OOD. It is important to consider that pre-existing attitudes or beliefs on NNS, among healthcare providers or the general public, may limit the optimal use of NNS. Hence these beliefs and attitudes about the use of naloxone, and the selection of individuals who can receive an OOD related naloxone intervention can be

challenging amid the opioid crisis and must be considered when educating the community and clinical providers on OOD and harm reduction interventions such as NNS.

### **Local Problem**

A significant problem in the state of Arizona is the high number of reported deaths associated with OOD. Arizona's OOD mortality soared by 74% from 2012 to 2016, with reports that 54 of those deaths were heroin related (AZDHS, 2019b). In 2015, Arizona hospitals were faced with 41,434 opioid reported encounters, with an estimated cost of \$341.5 million (AZDHS, 2019b). Additionally, the Arizona socio-economic reports revealed that the estimated cost of opioid-related encounters impacted Arizona by a 125% increase from 2009 to 2015 (AZDHS, 2019b).

In 2019, the state of Arizona rose to the 24th highest in the nation for reported OOD deaths, with a reported 29,742 OOD cases, and 3,740 deaths between 2017 to 2019 (Bipartisan Policy Center, 2019; AZDHS, 2019). During the same period, about 64,352 naloxone doses, an antidote for reversing opioid overdose were dispensed, with reported 19,017 naloxone doses administered (AZDHS, 2019). These current findings imply that the state of Arizona recognizes the public health crisis associated with opioid and heroin use and misuse in the state. Moreover, because of these significant concerns, the governor of the state of Arizona, Doug Ducey, set a motion in 2017 to reduce OOD mortality by implementing an opioid action plan, which proposed increasing statewide access to naloxone distribution (AZDHA, 2019a).

### **Intended Improvement**

Evidence has shown that there is a knowledge gap among the general public and even among healthcare providers surrounding the opioid overdose epidemic, the use and availability

of NNS, and related harm reduction approaches (NIDA, 2019a; Harm Reduction Coalition, 2012; US Food & Drug Administration [USFDA], 2019). Despite the lack of knowledge about the OOD epidemic, there are promising studies that indicate interventions, such as education are very effective in transforming community-based interventions, clinical practice and improving patient outcomes. For example, one study examined the effectiveness of naloxone administration and overdose education programs among bystanders in a nonclinical setting (Giglio et al., 2015). Findings revealed that trained participants had a higher average score than untrained participants for tests on naloxone administration, overdose recognition, and overdose response [95% CI = 0.92 to 1.77] (Giglio et al., 2015) thereby indicating the necessity and significance of educational and training efforts. This quality improvement (QI) project intends to explore whether offering education to clinical providers and nonclinical staff will improve their knowledge surrounding opioid overdose and the use of NNS in a local outpatient clinic.

The following sections will outline the purpose and a detailed plan for the implementation of a doctor of nursing practice (DNP) quality improvement (QI) project. The proposed QI project will provide an educational session on OOD and the use of NNS, recommend stocking the NNS in each clinic emergency code cart, and promote the availability and use of NNS in an outpatient clinical setting by clinical staff and clinical providers.

### **Project Purpose**

The purpose of this quality improvement (QI) doctor of nursing practice (DNP) project is two-fold. First, the project intends to provide clinical providers and nonclinical staff targeted education and training on benefits associated with administering of NNS. Second, recommendations to implement an evidence-based lifesaving protocol response for OOD in the

local clinical setting will be offered to participants in this QI project. The QI project aims to increase the clinical provider and nonclinical staff knowledge on the benefits of an evidence based OOD response protocol. The QI project will determine if the educational intervention impacts their readiness level to develop and implement evidence based OOD response protocols. This project director (PD) is interested in an opioid overdose educational program that educates explicitly clinical and staff witnesses (bystanders - clinical and non-clinical) on how to administer NNS to prevent opioid overdose in patients who may present to an outpatient clinical setting for care and treatment. Most opioid overdose recovery educational materials are focused on providing targeted information on overdose recognition and witness responses (i.e., developing skill and comfort in assessing and recognizing an individual experiencing opioid overdose) and using the NNS kit to reverse the overdose (Avarian et al., 2018; Behar et al., 2015; Giglio et al., 2015). Since this opioid overdose recovery method has been used in several studies, the following project questions will be used to guide this QI project.

### **Project Question**

The clinical question guiding the QI project is: In an outpatient clinic (P), will educating the staff on the use of naloxone nasal spray, an emergency medication (I), increase their baseline knowledge, comfort, attitude, and readiness to use NNS in treatment of OOD (O)?; comprehension of the educational session by participants will be measured immediately before and after the clinical providers and staff receive an educational training (T).

### **Project Objectives**

The QI project will offer evidence-based education and clinical guidelines on how to recognize and clinically respond to opioid overdose. The guidelines will include information on

the administration of NNS so that clinical providers, along with nonclinical staff, will become familiar with and may intervene in OOD by using NNS for patients who present with OOD in an outpatient clinic.

Objective 1: Educate clinicians, including nonclinical staff, on recognizing OOD symptoms, harm reduction efforts and the administration of NNS

Objective 2: Evaluate clinicians and nonclinical staff baseline knowledge, comfort, attitude, and readiness to use NNS in the treatment of OOD through the evaluation of pre and post educational assessment.

Objective 3: Provide an executive summary and formal recommendation for practice improvement to the local clinic administrators on the findings and the change in clinicians and nonclinical staff baseline knowledge, comfort, attitude, and readiness level to implement clinical protocols for the use of NNS for patients presenting to their clinic with symptoms of OOD. The educational program and training will address several topics including, opioid overdose risk, harm reduction, methods of NNS administration, pre and post overdose response, resuscitation protocol, and both state and local OOD policies.

### **Theoretical Framework**

The implementation of an opioid overdose education program as an evidence-based QI project is a secondary intervention – an indicated preventative measure to reduce the impact of opioid overdose death. A combination of the health belief model (HBM) and diffusion of innovation (DOI) theory will provide the theoretical foundation upon which this QI project is

designed and implemented. Both theories have been used to promote health and prevent health-related conditions (Janz & Becker, 1984; Rogers, 2003).

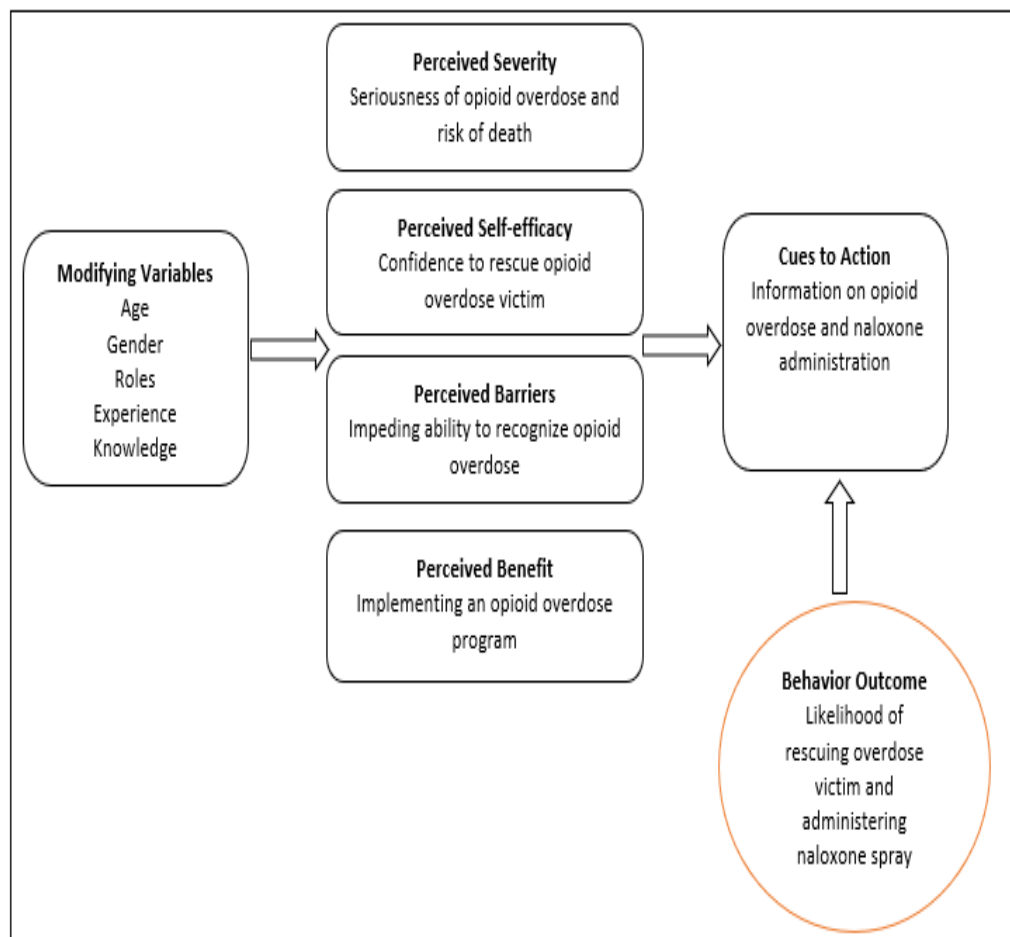
### **Health Belief Model**

Introduced in the 1950s by a group of social psychologists, the HBM is a value prospect framework for motivating people to adopt positive health related practices that focus on an individual's desire to avoid negative health issues (Janz & Becker, 1984). The HBM is based on six concepts that frames ways an individual will take health related actions necessary to achieve a goal: *perceived susceptibility* (one's belief on the risks of getting a condition), *perceived severity* (one's belief about a significant health issue), *perceived self-efficacy* (one's belief about confidence in their ability to take action efficaciously), *perceived barriers* (one's belief about the obstacle in their ability to taking action), *perceived benefits* (one's belief about the benefit in taking action necessary to mitigate the threat of a health issue), and *cues to action* (exposure to factors that activates "readiness" to take action) (Janz & Becker, 1984).

The ability for individuals to avoid dangerous health risks and become more informed and aware while recognizing their power to prevent negative health consequences is the foundation of the HBM (Janz & Becker, 1984). The HMB can be a suitable framework for developing health education strategies (Janz & Becker, 1984). Examples of what 5 of the 6 concepts will look as they apply to opioid overdose programs at an outpatient setting are as follows: *perceived severity* (outpatient staff belief about the severity of opioid overdose, particularly the risk of death), *perceived self-efficacy* (outpatient staff believes in their ability and confidence to rescue an opioid overdose victim); *perceived barriers* (outpatient staff perception impeding their ability to recognize an opioid overdose and or the use of intranasal rescue

naloxone), *perceived benefits* (outpatient staff believes in the benefits of participating in opioid overdose program); and *cues to action* (whether the outpatient staff is made aware of the opioid overdose educational program that prompts taking necessary action to save lives).

The HMB is a useful framework for this QI project because it promotes the idea that messages (i.e., the information offered in an opioid overdose response program) will accomplish optimal behavioral change if they target the outpatient's staff perceived severity, self-efficacy, barrier, benefits, and cues to action (Janz & Becker, 1984) as they deliver life-saving interventions (NNS) during an OOD situation. The HBM model has been applied in several studies to assess how individuals' beliefs influence their understanding of health-related behaviors in nutrition, smoking cessation, dental care, exercise, contraceptives, weight management, vaccinations, and health conditions (Janz & Becker, 1984). However, limited studies have examined health beliefs related to opioid overdose and naloxone intervention. The HBM can be viewed below in Figure 1.

**Figure 1***Health Belief Model (HBM) Illustration*

(Janz & Becker, 1984)

**Diffusion of Innovation Theory (DOI)**

The DOI is the second selected theoretical framework for this QI project. Developed in 1995 by Rogers Everett, the DOI aims to explain the psychological aspects of how individuals or members of a social system respond to new ideas or practices over some time (Rogers, 2003). Ultimately, the goal of the DOI is to influence the adopter's decision to accept or reject the new system (Rogers, 2003). Rogers explained that there are five essential characteristics in the

diffusion and communication process designed to understand why some innovations are successful, while others never get accepted (Rogers, 2003). These characteristics include complexity, trialability, relative advantage, observability, and compatibility (Rogers, 2003).

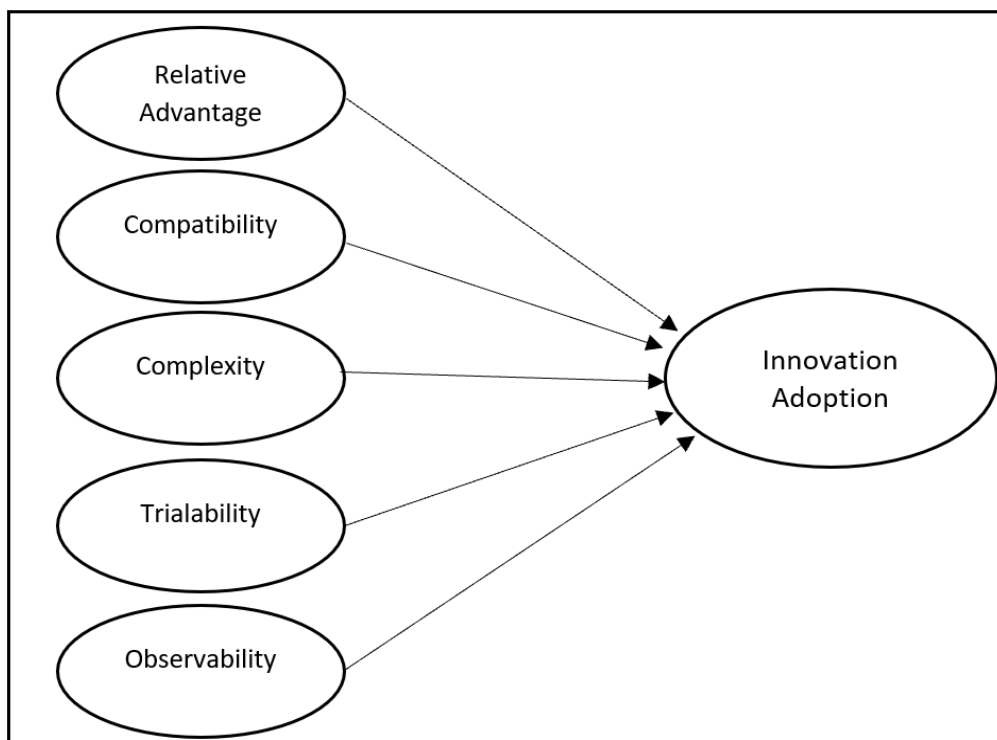
To initiate and diffuse the idea of the opioid overdose program, four of the five DOI components were adopted in the following way: Relative advantage - is the degree to which potential audience (stakeholders) perceived value of the innovation as superior to the current situation (Rogers, 2003). In this analysis, the relative advantage will be achieved by replacing the facilities absent opioid overdose program with an evidence-based practice solution that promotes greater patient safety. Next, compatibility indicates if the stakeholders perceive the ideas to fit their needs or existing value (Rogers, 2003). In this analysis, an example of compatibility is that potential audiences (stakeholders) are already providing health care services to the substance abuse population. Therefore, the opioid overdose prevention program aligns with their value. Next, complexity is how difficult or easy it is for an adopter to learn an innovation (Rogers, 2003). The adopters will be faster in adopting the newly proposed and innovative process if usability is simple. In this analysis, opioid overdose educational content is used and is new and innovative information for the clinical team. The delivery content is simply a PowerPoint presentation, including videos and demonstration material. This variety of educational material is intended to account for different learning styles. Lastly, observability enables adopters to figure out the benefits of adopting an innovation (Rogers, 2003). In this analysis, an example is to evaluate stakeholder's knowledge gained through the use of pre- and post-surveys administered before and after an opioid overdose educational intervention. This approach allows stakeholders to see side-by-side comparisons of before and after results and the immediate impact of an

educational intervention on knowledge, comfort, attitude, and readiness level to integrate the specific knowledge gained about life-saving efforts designed for opioid overdose victims.

The DOI is a good fit for this QI project because innovation that is perceived as less complex, more compatible, having a relative advantage, and is observable may diffuse better and is more likely to be adopted than other innovations. A limitation of the DOI is that most of the evidence was not explicitly developed for public health or for applying health innovation (Rogers, 2003). However, the success of innovation lies in aligning all the characteristics and ensuring that the innovation adjusts with the adopter's beliefs, attitude, values, and behaviors and those considerations have been applied in the design of this QI project (Rogers, 2003). The DOI can be viewed below in Figure 2.

**Figure 2**

*Diffusion of Innovation (DOI) Characteristics Illustration*



## **Literature Synthesis**

Maintaining a focus on the PICOT question allows for a focused and relevant literature review. A focused and relevant literature review adds to the quality of this QI project while providing evidence on the state of the science, gaps in the literature, and guidance on proven and effective methods of quality health care improvement strategies. Once again, the PICOT for this project is: In an outpatient clinic (P), will educating the staff on the use of naloxone nasal spray, an emergency medication (I), increase their baseline knowledge, comfort, attitude, and readiness level to use NNS in treatment of OOD (O); comprehension of the educational session by participants will be measured immediately before and after the clinical providers and staff receive an educational training (T). The results of the literature review are presented next.

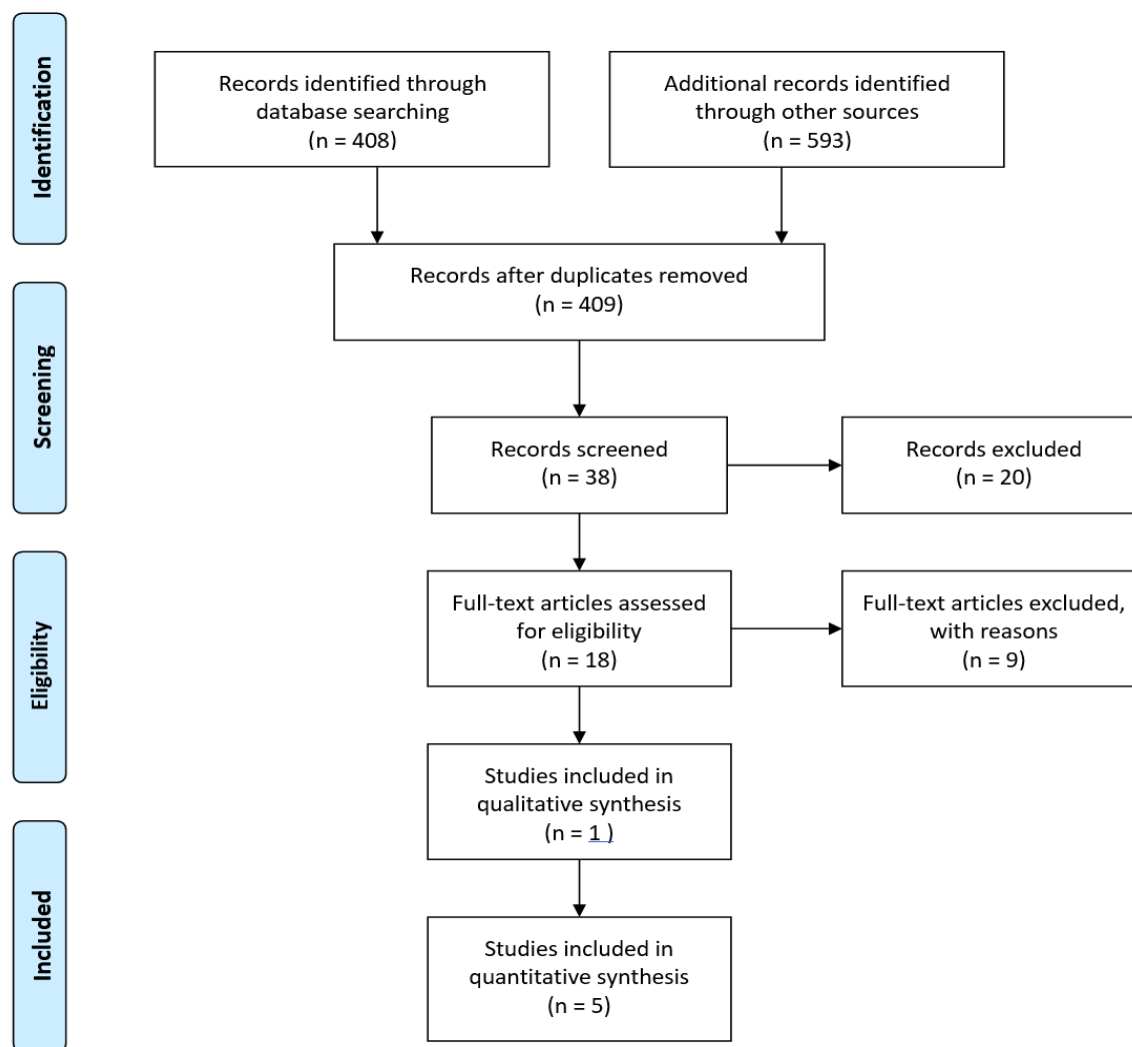
### **Evidence Search**

A literature review was conducted for all English-language studies on opioid overdose and intranasal Naloxone using the following search engine and databases: EMBASE, PubMed, Google Scholar, and Medline. Key terms utilized were “naloxone,” “nasal spray,” “opioid overdose,” “reversal,” “bystanders,” “perception,” “outpatient clinic” and “community setting.” Several articles were explored for the best evidence on the use of intranasal naloxone intervention when rescuing an opioid overdose victim. Filters included ‘randomized controlled trial,’ ‘clinical trial,’ ‘peer review,’ and ‘meta-analysis.’ Additionally, date delimitations for the literature search ranged between 2015 to the present. The search yielded 1001 studies. After applying the inclusion criteria, 409 studies were removed. The inclusion criteria were major clinical studies or systematically reviewed journals that evaluated NNS use in adolescents aged 12 and older and adults in a community setting. International studies were also included as the

opioid overdose epidemic is impacting many countries worldwide including the United States (US) (Volkow et al., 2019). Studies with a sample of non-health professionals, particularly bystanders administering NNS to opioid overdose individuals, were preferred and included in this review.

Studies conducted with children < 12 years of age, nonhuman study types, and studies conducted on individuals who were prescribed opioids for pain were excluded from this review. As the opioid overdose epidemic continues to worsen, studies that described public access to Naloxone for opioid overdose and nonclinical bystander's administration of NNS in a community setting were significant studies to include because of their relevance to this QI project purpose. In total, 18 eligible studies were reviewed. Of the 18 studies, five were quantitative studies, and one was a qualitative study.

Studies speaking to the attitude and perception of bystanders towards opioid overdose disorder and the use of NNS treatment at outpatient clinics were scarce. Google Scholar was used as a supplement search option to ensure the thoroughness of the initial searches. The literature search strategy utilized the PRISMA search recommendations and can be viewed below in Figure 3.

**Figure 3***Literature Review Strategies PRISMA Flow Diagram*

### Comprehensive Appraisal of Evidence

Several themes emerged during the process of appraising and synthesizing the literature. There was consensus among the literature that intranasal naloxone's use did save lives in OOD related occurrences by reversing the effects of the opioid (Avetian et al., 2018; Mahonski et al., 2020). There was also literature supporting the idea that educational intervention can impact the

attitude and comfort level in recognizing and administering NNS in an OOD situation (Klimas et al., 2015; Ray et al., 2015). A final theme in the literature is that educational intervention can increase knowledge towards the management of OOD (Ashrafioun et al., 2016; Giglio et al., 2015). More details on these studies are presented in the following section.

### **Naloxone Reverses Opioid Overdose**

The impact of NNS on reversing the effects of a related opioid overdose and saving lives has been well researched. Although some research findings outline mixed perceptions and concerns that NNS may increase risky behaviors and not decrease the OOD crisis (Drainoni et al., 2016; Haug et al., 2016). Several studies demonstrate a correlation between the use of NNS and reversing suspected OOD (Avetian et al., 2018; (Mahonski et al., 2020). For example, a study examined the efficacy of NNS use in various community-based organizations (Mahonski et al., 2020). These community-based organizations include county government, health departments, emergency medical services, advocacy groups, law enforcement, community outreach volunteers, shelters, pharmacy centers, and harm reduction organizations (Avetian et al., 2018). Findings from these community organizations indicate that NNS successfully reversed OOD in 98% (242/245) of their cases (Avetian et al., 2018). The authors also revealed that 73% (125/170) of the OOD reversal cases response time was  $\leq 5$  minutes after NNS was administered (Avetian et al., 2018). Nearly 95% (165/173) of the cases involved heroin, while 5.2% (9/173) involved fentanyl (Avetian et al., 2018). The authors concluded that three deaths occurred due to delays in administering NNS in three of the cases (Avetian et al., 2018). These findings were also reflected in an extensive study of over 1,139 doses of NNS administered to patients with opioid toxicity (n = 958) and who were also unresponsive [n= 1097] (Mahonski et al., 2020).

Findings from this study reveal that 98% of the OOD victims (n=958) survived after receiving NNS formula (Mahonski et al., 2020). These studies have begun to provide insight into how NNS positively impacts the OOD crisis by successfully reversing respiratory suppression in suspected OOD in most of the reported cases in the community settings (Avetian et al., 2018; (Mahonski et al., 2020). The success of these efforts also depended on the timely arrival and correct administration of the NNS dose (Avetian et al., 2018).

### **Effect of Education on Comfort, Attitude and Readiness Level**

One of the measures to prevent fatal overdose is by providing training on the use and benefits of naloxone (Ray et al., 2015). Education increases the likelihood of bystander intervention in OOD situations (Ray et al., 2015). One study evaluated the effectiveness of naloxone training on police officer's attitudes and comfort levels related to naloxone administration (Ray et al., 2015). Findings demonstrated that the officers had a positive attitude and reaction and felt comfortable administering NNS in an overdose situation (Ray et al., 2015). The trained officers felt that NNS was relatively simple to administer at an overdose scene (Ray et al., 2015). Also, the trained officers felt that others should be trained to use NNS (Ray et al., 2015).

A second study evaluated the efficacy of education on general practitioners' knowledge and attitude towards overdose management (Klimas et al., 2016). Findings in this study revealed that participants' knowledge of OOD risks and appropriate actions increased significantly post-training [MD 3.53; SD 4.45] (Klimas et al., 2015). The study also highlights significant improvements in practitioners' attitudes and high confidence in OOD management [MD 11.13; SD 6.38] (Klimas et al., 2015). A substantial emphasis from these studies is that educational

intervention improved knowledge, comfort, attitudes, and readiness level to intervene during an OOD situation (Klimas et al., 2015; Ray et al., 2015). Additionally, the educational intervention from these studies helped understand how people may respond to an OOD situation (Klimas et al., 2015; Ray et al., 2015). Recognizing the implications of education intervention prompted the development of this QI project, which is focused on the use of education specifically for the roles of clinical and non-clinical bystanders/witnesses in the management and prevention of OOD at an outpatient clinic setting.

### **Effects of Educational Intervention on Knowledge**

Evidence from a variety of studies demonstrates that opioid overdose training increased knowledge and the odds of survival after naloxone administration. (Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2015; Ray et al., 2015). One of the studies evaluated the effectiveness of overdose education programs and the administration of naloxone by bystanders (Giglio et al., 2015). Findings revealed that increased overdose knowledge was significantly higher in trained participants than untrained participants for tests on overdose recognition, response, and naloxone administration [95% CI = 0.92 to 1.77, SD = 1.35] (Giglio et al., 2015). Findings indicated naloxone treatment by bystanders increased the odds of victim survival when compared to situations where there was no naloxone administration [95% CI = 3.90 to 13.25, OR = 8.58] (Giglio et al., 2015).

Another study evaluated the effectiveness of overdose prevention training on participants (family, friends, providers, & first responders) knowledge and confidence to administer naloxone (Ashrafioun et al., 2016). Findings revealed a significant increase in knowledge from pre- to post-training [MD 4.2 to MD 6.2; 83%] (Ashrafioun et al., 2016). Participant's confidence in

recognizing and responding to OOD situations improved significantly from pre- to post-training and particularly among those trained to use intranasal compared to intramuscular naloxone injections [MD 3.7 to MD 5.9; 85%] (Ashrafioun et al., 2016). Moreover, there were some inherent reasons why confidence was higher among those trained using intranasal versus intramuscular injection (Ashrafioun et al., 2016). For instance, fear of needle sticks or difficulties administering injection may make participants feel uncomfortable (Ashrafioun et al., 2016) therefore, decreasing their confidence level (Ashrafioun et al., 2016). Regardless of the administration route, an important emphasis in this study is that prevention and educational interventions and/or programs inclusive of bystanders, and not just medical professionals improve knowledge and confidence level related to intervening in OOD situations (Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2015; Ray et al., 2015).

### **Strengths of Evidence**

Studies consistently demonstrated the effectiveness of strategies to reduce harm, such as opioid overdose education and the distribution of NNS to prevent OOD fatality (Avetian et al., 2018; Giglio et al., 2015; Ray et al., 2015). The six articles selected for this review were directly relevant to the PICOT question. Each of these studies confirmed the significance of the plan to develop an educational intervention designed to influence knowledge, comfort, attitude, and readiness in recognizing symptoms of OOD and administration of the NNS (Avetian et al., 2018; Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2015; Mahonski et al., 2020; Ray et al., 2015). All six studies were peer-reviewed by many experts in the field before being published (Gannon, 2001). Collectively the studies included in this review were within five years of publication and of high scientific quality.

An appraisal tool designed for quantitative and qualitative studies was used to appraise all six of these studies (Ryan et al., 2007; Coughlan et al., 2007). All the articles had elements such as title, abstract, and author's qualifications (Ryan et al., 2007; Coughlan et al., 2007). One way to assess quantitative measures of confidence in a study is the use of a large sample. Large sample sizes were seen in these selected studies (Ashrafioun et al., 2016; Giglio et al., 2015; Mahonski et al., 2020). In addition, participants were fully informed about the nature of the research in all six of the studies (Ryan et al., 2007; Coughlan et al., 2007). Many other factors that could influence the believability and robustness of the research were noted in all six of the articles selected. Some of these factors include the presence of research problems, hypotheses or objectives, data collection processes, quality discussions, conclusions and recommendations, and the citation of relevant references (Ryan et al., 2007; Coughlan et al., 2007).

Additionally, using the hierarchy of evidence adopted from Sackett (1989), two of these selected studies were determined as level I or meta-analysis/pilot experimental studies (Giglio et al., 2015; Klimas et al., 2015); two studies as level III or cross-sectional/exploratory studies (Ashrafioun et al., 2016; Ray et al., 2015); and two studies as level IV or retrospective cohort studies. (Avetian et al., 2018; Mahonski et al., 2020). The hierarchy of various types of scientific published evidence can be seen in Table 1.

**Table 1***Evidence Level of Hierarchy Illustration*

Level of Evidence (LOE)	Strong Recommendation	Recommendations	Option	Option
	A Consistent result, sample size, literature review	B Reasonable consistent result, insufficient sample size	C Little evidence with inconsistent results, insufficient sample size	D Little or no evidence
Level I Systematic review, meta-analysis, randomized controlled trial, or clinical practice guidelines	X	X		
Level II Randomized clinical trial				
Level III Controlled trials without randomization	X	X		
Level IV Case control, series, retrospective, or cohort studies	X	X		
Level V Expert opinion, case report				

**Weaknesses of Evidence**

Despite the robustness of the chosen studies, some significant weaknesses and flaws in a few of the studies were detected. One study demonstrated a very low response rate due to limited study time (Avetian et al., 2018). For example, only eight out of the 152 organizations participated in this study (Avetian et al., 2018). Responses and data collection were based on unconfirmed reports due to the retrospective nature of the study (Avetian et al., 2018). Regrettably, a low response rate, including unconfirmed reports, may inherit sampling response

bias (Coughlan et al., 2007). Consequently, studies with low response rates may present a wide range of inaccurate responses (Coughlan et al., 2007). Findings in Ray et al. (2015) had a few weaknesses. The study lacked a comparison group, which plays an important role in measuring the effectiveness of an intervention (Ray et al., 2015). Despite all these weaknesses, most of the studies had strong elements that influenced their credibility, and findings from these studies contributed to the development of this QI project.

### **Gaps and Limitations**

Several limitations were seen throughout the chosen articles. Findings from these selected articles were subject to a small sample size (Avetian et al., 2018; Klimas et al., 2015; Ray et al., 2015). For instance, one study only had a sample size of 23 (Klimas et al., 2015). While the other had sample sizes of 117 (Ray et al., 2015). Small sample sizes can affect the reliability of survey results, skew the results, and provoke bias (Coughlan et al., 2007). The following selected studies were not generalizable to a larger QI population (Ashrafioun et al., 2016; Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2016). For instance, in one study, an opioid prevention education was administered in one metropolitan area and by the same trainer (Ashrafioun et al., 2016). The generalizability of this training is unknown to a broader group of people in different situations (Ashrafioun et al., 2016). To increase the generalizability of a study, it would have to be repeated with the same intervention in different settings (Shenton, 2004). The findings of Ashrafioun et al. (2016) lacked long-term follow up to assess whether participants retained knowledge and confidence following the educational intervention. The effects of long-term follow-up are critically essential in understanding and increasing the overall long-term effectiveness of a research effort (Shenton, 2004; Coughlan et al., 2007).

Several studies revealed that opioid prevention training was effective in increasing trainee's (first responders, police officers, bystanders, EMS, family/friend) knowledge and confidence to respond appropriately (Ashrafioun et al., 2016). Unfortunately, there is insufficient literature specific to training outcomes among outpatient clinical settings. Considering the importance of opioid prevention training programs in the outpatient setting, outcomes specific to an outpatient clinical setting require further exploration. This project intends to address the gap by educating clinicians and nonclinical staff of the BIHC (an outpatient clinical setting) on the use of NNS in the treatment of an OOD.

## **METHODS**

To facilitate the smooth implementation of a QI project, a robust amount of planning, demonstrating, testing, and a full explanation of the project design is essential. This QI project aims to outline the methodology for composing intervention strategies, including concentrating on microsystems, problem analysis, developing goals and action plans, monitoring progress, and ultimately testing the innovation.

### **Project Design**

This QI project used a pre- and post-quantitative approach to evaluate the impact of education on recognizing an opioid overdose and increasing understanding of naloxone administration among clinical and non-clinical staff in an outpatient clinic. The training was executed by launching an asynchronized learning method for all staff interested. Qualtrics was the program used to distribute the education content, pre- and post-surveys and collect and analyze concluding data. To determine improvement in knowledge, a pre-test survey was administered before the educational session, and a post-test survey was administered

immediately after the completion of the education intervention. The pre- and post-test results were compared following the educational intervention. This next section provides an overview of the step-by-step QI process. The framework used to guide and achieve the anticipated evidence-based practice implementation outcome is known as the “Model for Improvement” framework.

### **Model for Implementation**

Implementing an opioid overdose prevention program at a clinic can be an essential step in mitigating opioid overdose fatalities. The framework used in this QI project was the Institute of Healthcare Improvement (IHI) *Model for Improvement*, which focuses on guiding and accelerating improvement within an organization (IHI, 2020). Used by hundreds of healthcare organizations, the model for improvement (MFI) starts with three fundamental questions that guide the PD in establishing specific aims that identify areas for improvement, determining criteria that can indicate whether there are improvements that need to be made, and gathering ideas of how improvement can be driven (IHI, 2020). Once the PD has worked through the first three questions of the MFI, the next action taken is to implement the change using the IHI’s plan-do-study-act (PDSA) cycle (IHI, 2020). The project director used the PDSA cycle to quickly implement an action plan to test the change, study the test results, and recommend change based on what was discovered from the pre- and post-survey results (IHI, 2020). A summary outline for the three fundamental questions and the PDSA cycle used in this QI project can be seen in Figure 4.

This QI project’s objectives were to increase clinical and nonclinical staff knowledge, comfort, attitude, and readiness to use intranasal naloxone therapy in patients who present with symptoms of OOD. A pre- and post-survey was administered before and after a 20-minute web-

based PowerPoint presentation (e-lecture). The educational session was explicitly designed with content that increased clinic provider and nonclinical staff knowledge, comfort, attitude, and readiness to intervene to use NNS in OOD treatment.

Next, the PD analyzed the outcome measures to determine whether the desired improvement was met. While the overall aim was to increase staff knowledge using educational content, the target outcome measure was to assess comparisons between participant pre- and post-education session survey responses for detecting a change in participant knowledge, comfort, attitude, and readiness to use the NNS in the treatment of OOD.

A 5-item survey using multiple-choice, Likert, and true/false questions was used on the pre- and post-survey assessments. The Likert scale is a self-report widely accepted tool used to assess change in attitude and behaviors. The Likert scale typically uses response options like “strongly agree” to “strongly disagree” in measuring respondents’ attitudes and behaviors. This outcome measure allowed the PD to review and assess how the educational content affected the differences in knowledge related to the educational session on OOD, the use of NNS and OOD harm reduction interventions.

When the fundamental questions aims/objectives, measures, and anticipated practice change was determined, the next phase in the MFI was to apply the components of the plan-do-study-act (PDSA) cycle. The PDSA cycle was used to design and implement the planning, testing, studying, and refining of the proposed QI change based on findings discovered in the final analysis of the pre- and post-surveys (IHI, 2020).

**Plan**

The initial '*Plan*' phase required an assessment of the local problem at the implementation site. This particular site does not have an OOD response protocol in place. This project aimed to offer evidence-based education to the outpatient clinic staff on the harm reduction efforts related to opioid overdose and administration of naloxone therapy. The PD expected the clinical and nonclinical staff would demonstrate an increased likelihood of confidence and readiness to intervene in an opioid overdose situation after participating in an educational intervention. A long-term goal of this project is that the clinical and nonclinical team in this outpatient setting will have comfort in responding to suspected opioid overdose by administering naloxone therapy after receiving adequate training on lifesaving measures. In the planning phase, the PD discussed who is involved in the planning, who the project participants will be, how participants were recruited, the timing, potential risks and benefits of the intervention, and the cost of the intervention. The PD was responsible for carrying out this plan and communicating the idea to the stakeholders (clinical supervisor, clinical team, & QI manager) involved in the implementation site's decision-making processes.

**Do**

The next activity is the '*Do*' step, in which the components of the plans are implemented, including the step-by-step outline of the QI project implementation, data collection process, data analysis and reporting of findings. During the recruitment process, the PD used a convenience sample approach by sending email messages and flyers to clinic providers and staff. Participants were asked to consent to participate in the intervention voluntarily. A consent form or waiver of consent was made available to each participant. All staff members (psychiatric & medical

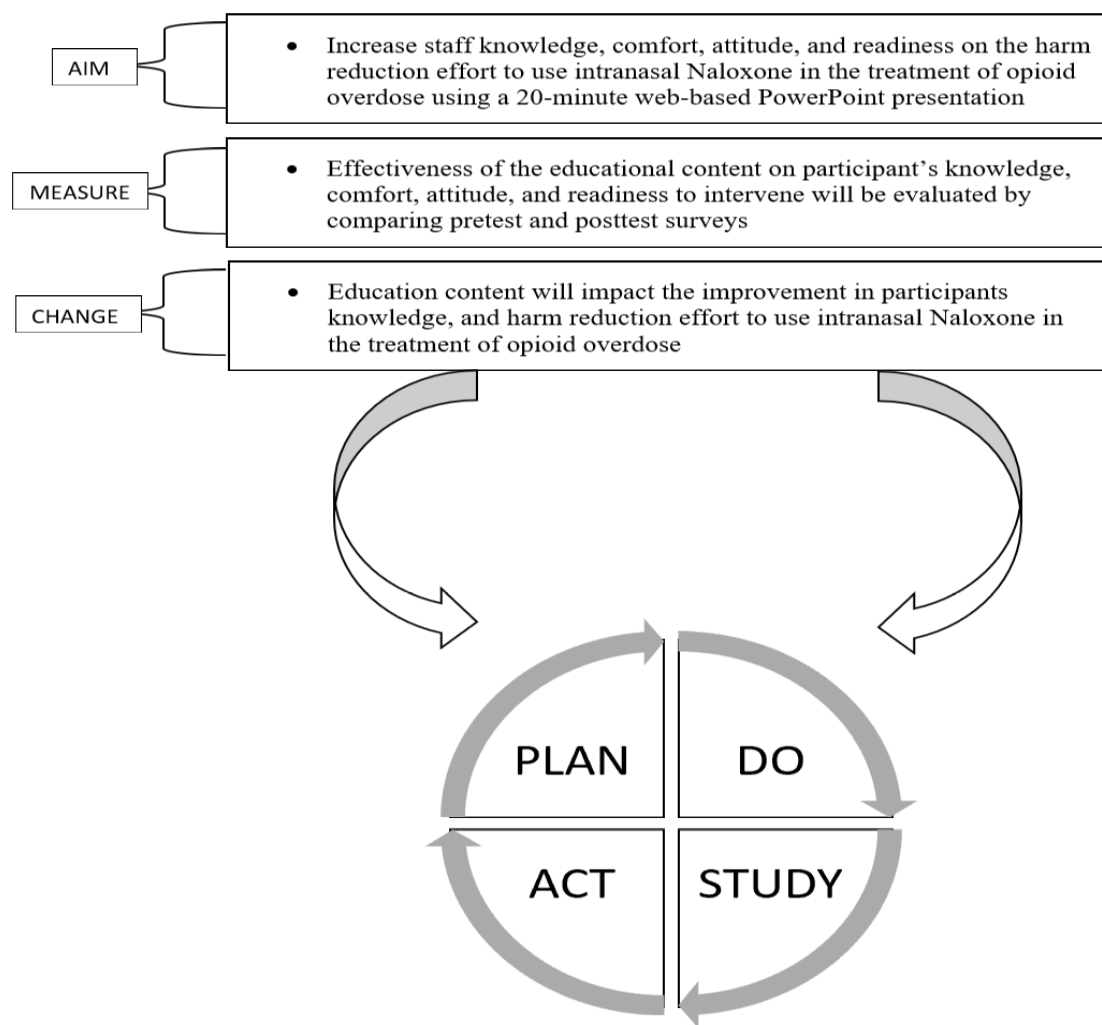
providers, social services team, medical assistants, & front desk staff) at the clinical site were invited to participate in the PowerPoint presentation (project intervention) delivered via an asynchronized learning activity. Staff's knowledge, comfort, attitude, and readiness level was tested before and after the educational content was delivered. Time to educate staff on the opioid overdose content took about 20 minutes. The PD provided synopsis of the training to the participants so that there was no disrupted flow during the session. The effectiveness of the educational intervention was evaluated by the comparison of the pre- and post-survey responses completed by each participant. Participants completed a 20-item electronic survey before and after participating in the opioid overdose educational intervention. Each survey took approximately 10 minutes to complete (Appendix F).

### **Study**

The next activity is to '*Study*' and analyze the collected data. In this study phase, the PD compiled the collected data, including surveys, to compare and determine if the education resulted in any change of knowledge, comfort, attitude, and readiness level of participants. The PD used descriptive analysis to present demographic data and findings of the pre- and post-survey results. The participants' knowledge from the pre- and post-surveys were analyzed by calculating the differences between pre- and post-survey results. The Likert scale-based survey was analyzed using the mean average score for the scale item. Additionally, the PD documented descriptive analyses of observations, recommendations offered by clinical providers and staff, including any modifications to the plan, problems, successes, or unexpected findings.

**Act**

The next activity is the 'Act' step. In this phase, the PD focused on making a recommendation to the clinic administrators, providers, and staff to implement an OOD protocol at their clinic. Whether the clinical teams decide to implement an opioid overdose intervention program was left to policymakers and stakeholders at the local clinic. The PD also considered expanding and sharing the recommendations to other clinical locations, assuming the site has additional clinics. Lastly, there were possibilities that the PD might adjust the recommendations based on input from the local stakeholders and participants as this is an inclusive and collaborative approach to QI. A model of the MFI and PDSA process is illustrated below in Figure 4.

**Figure 4***Plan-Do-Study-Act (PDSA) Cycle*

(IHI, 2020).

### Setting and Stakeholders

The implementation of this QI project will take place at one of the Bayless Integrated Healthcare Centers (BIHC) located in Phoenix, Arizona, also known as South Mountain Clinic and founded in 1982 by Dr. Michael Brad Bayless, a forensic and clinical psychologist (BIHC, 2020). Between 2008 to 2010, second-generation owner, Justin Bayless transformed the BIHC

into an integrated health care system that utilizes a multidisciplinary team approach (BIHC, 2020). According to the Arizona Practice Transformation Network (APTN), Bayless provides several integrated services to a diverse and broad-spectrum underserved population with payers mix of approximately 70% Medicaid and 5% Medicare (n.d.). Services offered by Bayless include family medicine, behavioral health, addiction treatment, and virtual care (BIHC, 2020). Bayless focuses profoundly on the opioid crisis and provides services for substance use disorder, addressing a gap in the much needed behavioral health services required by this high risk population in the South Mountain region (APTN, n.d.). The town of South Mountain begins at 24th street (east side) and South Mountain Park (AZDHS, 2018). Nearly 125,526 individuals live in this neighborhood, of which 62% are Hispanic, 44% White, and 16% African Americans (AZDHS, 2018). About 41% of children under the age of 12 live in poverty (AZDHS, 2018). Although there were no reports of adults facing hardship, this PD knows many local families/individuals are in financial burden based on the reported number of children in poverty. The unemployment rates in this community are said to be 8.8%, compared to Arizona with a rate of 7.1% (AZDHS, 2018). Poverty and unemployment are known to be contributing factors to substance abuse in both rural and urban areas (Pullen & Oser, 2014).

For this DNP QI project to be successful, this author must include critical stakeholders in the project who possess a wide range of relevant expertise on implementation and access to front line teams that have direct exposure to the issues related to the issue of an opioid overdose. The Institute for Healthcare Improvement (IHI) recommends carefully and intentionally selecting and including expertise within an organization when implementing quality improvement efforts. These key stakeholders include system leaders, clinical technical experts, and day-to-day

leadership (IHI, 2019). System leaders are the most critical and key stakeholders for a QI project implementation plan. For instance, in an outpatient clinical setting, key stakeholders might include - medical director, psychiatrist, and nurse practitioners. The day-to-day leadership may also include supervisors, lead medical assistants, and therapists. The primary target participant group for this QI project will be the clinical providers (physicians, nurse practitioners, social services team, medical assistants) and nonclinical staff (receptionist, administrative assistants) who provide direct care to a patient with opioid use disorder.

### **Planning the Intervention**

During the process of this QI project, it is QI project director's goal to work with members from the clinical care team to gather feedback regarding their insights and impressions on initiating an OOD program and protocol within their clinic. For this goal to be achieved and prosperous, this PI will collaborate with some experts, including stakeholders at the clinic.

### **Inter-Professional Collaboration**

A system leader is an individual with a form of authority who facilitates change within an organization (IHI, 2019). For this QI project, the clinical supervisor, Dr. Fong Luis, was assigned the system leadership role. Next is the assigned clinical expert. A clinical expert can assist staff in the process of ongoing continued education and may assist in the implementation of the QI project recommendations (IHI, 2019). One crucial factor that contributes to clinical technical expertise is the years of experience. For this project, the medical assistant lead at the clinic was assigned to the clinical expert role. A day-to-day leader relationship requires continuous and daily engagement to assist the project director in driving the project, oversight of data collection, and ensuring changes align with clinic goals (IHI, 2019). For this project, the project director

will manage the day-to-day procedures of this project. The project director will meet with the stakeholders to discuss initiating an opioid overdose prevention program. The theoretical framework of diffusion of innovation theory will be utilized to inform the stakeholders about the opioid overdose protocol. The use of the diffusion of innovation theory empowers the stakeholder's decisions and stimulates innovation and participation. Collaborative discussions will allow for an inclusive and collaborative process and a shared exchange of ideas on implementation of this QI innovation.

### **Organization Approval Process**

The BHIC clinic has a small body of 40 clinical and staff members and is managed by the clinical supervisor (designated system leader). Since the clinical supervisor is one of the advocates for this project, his signature and approval was required before proceeding with this project implementation. The University of Arizona IRB approvals were obtained prior to implementing this QI project.

### **Materials Needed for the Project**

The surveys have 20 items on the pre- and post-surveys. Each survey was constructed with seven multiple-choice questions, ten 5-point Likert scale questions, and three true/false questions. The multiple-choice and true/false questions from the pre- and post-test survey will measure the staff's knowledge from the opioid overdose educational content. The Likert scale questions will evaluate the staff's attitude and readiness level on recognizing opioid overdose and intervening. The questionnaires were cautiously reviewed so that quantitative data could be analyzed adequately to determine changes in the knowledge, attitude, comfort and readiness level of each participant on the proposed protocol. The use of necessary office supplies and

software was provided by the project director and were utilized throughout the process of planning, training, implementing, and data analysis for this project.

Several software programs, including a laptop computer, were required to prepare and conduct the educational intervention material. The laptop was used to send out emails about the project to participants and also to deliver the asynchronized learning activity. The laptop software included Microsoft PowerPoint for presentation; Microsoft excel for analysis of data; Microsoft Word for creating documents, flyers, pre-/post-tests, flyers, and compiling descriptive statistics. An electronic description of the health care supplies (naloxone kits) was presented in the e-lecture. For demonstration purposes, an actual naloxone kit was also shared visually via the video presentation.

### **Participants and Recruitment**

A full range of staff and clinicians make up the multidisciplinary integrated care team, and each is employed in full-time and part-time clinical positions. The clinic has also provided training and support, such as preceptorship for students at BIHC South Mountain location. All adult employees (administrators, clinicians, staff, & students) who are currently working at BIHC were invited to participate in this QI project. The inclusion criteria include: must be at least 18 years of age or older, must provide informed consent to participate in the educational session and complete the pre- and post-survey, must be employed at the BIHC as a full or part time employee or student resident/intern and must be able to speak English, read and write.

The exclusion criteria for this project included participants who did not provide consent to participate voluntarily. Furthermore, both clinical and nonclinical staff were invited to participate because they worked directly with this high-risk population of interest. Arizona

Department of Health Services (AZDHS) continues to report an increase in opioid overdose and heroin deaths (2020). An estimated 37,999 possible opioid-related overdose and 4,815 deaths were confirmed between 2017 and 2020 (AZDHS, 2020).

### **Recruitment and Step-by-Step Procedures**

During the recruitment process, this PD recruited participants by appointing the clinical supervisor at the BIHC clinic to send out the recruitment email to all staff members. Participants were recruited three weeks in advance, inviting them to participate voluntarily in the project (OOD & naloxone training) and ensure their identity's safekeeping. The clinical supervisor at the BIHC approved this form of recruitment.

The goal of this PD was to recruit at least 12 eligible participants. Three separate reminder emails were sent (each reminder was sent 48 hours apart) after initial email was sent to employees who expressed interest in participation; therefore, there were several reminders and opportunities to sign up to participate in this QI project.

The recruitment and reminder email invitations offered instructions and details about the purpose, method, duration, benefits, and risk of participating in the project. Instructions on this email directed participants to click on the PowerPoint presentation link. Participants with this link had access to the PowerPoint presentation. Editing privilege is disabled on the PowerPoint link so that participants cannot edit the education content. The PowerPoint presentation further provided the participants with step-by-step directions on taking the pre- and post-surveys embedded in the Qualtrics platform. A Qualtrics link was provided in the third slide of the PowerPoint for completion of pre-survey segment.

At the beginning of the web-based Qualtrics pre-survey, disclosure consent was obtained using skip logic to ensure that only consenting participants can administer the survey.

Participants were provided with disclosure consent before and after the education intervention so that they could make their own informed choice about whether to participate in the project.

Participants could withdraw from the study and or refuse to answer the survey questions without consequence or penalty. If the respondent agreed to participate in the project, the first page (demographic & pre-survey) would automatically continue, and the participant could resume the pre-test survey section.

At the end of the pre-test survey, the participants are automatically redirected to the educational content (PowerPoint presentation format). All participants were given the same opioid overdose training program and a pre-/post-survey. Participants were offered an educational session (OOD & NNS training) via asynchronized learning method (PowerPoint presentation & video clips) that was accessible to those participants who consented to participate. The asynchronized learning content was brief (20 minutes in total).

Upon completing the education session, there was a Qualtrics link for the posttest survey on the 19th slide of the PowerPoint presentation that automatically directed participants to the post-survey section. Once the post-survey was completed, a final thank you statement acknowledging the respondents' time spent on the educational sessions was displayed. There was no incentive allocated to participants in this project. Total time spent to participate in the pre and post survey, including education sessions, was 45 minutes. Participants were allotted five minutes to complete the demographic, 10 minutes to complete the pre-test survey, 20 minutes to complete educational content, and 10 minutes to complete the post-test survey (Table 2).

**Table 2***Outline of the Asynchronized Training and Pre- and Post-Surveys*

<b>Duration (min)</b>	<b>Asynchronized Learning Activity</b>
5	Consent and demographic survey
10	Pretest survey
20	Asynchronized online training on opioid overdose prevention with direct references and guidance from AZDHS, Adapt Pharma Operations and Sonoran Prevention Works
10	Posttest survey

**Consent and Ethical Considerations**

There are comprehensive research ethics that must be met when conducting a study with human subjects. Though this is not research and instead a quality improvement project, it's essential to review ethical considerations and how they apply these considerations to this project. According to the Belmont Report, research ethics are based on fundamentals principles: justice, beneficence, informed consent, and respect (Department of Health Education and Welfare [DHEW], 2018). Maintaining ethical principles is crucial for providing maximum benefits for the participants and maintaining integrity research processes and these ethical principles were applied in this QI project (DHEW, 2018). The federal government legislation regulates these ethical principles in human research and researchers must commit to these principles (DHEW, 2018).

**Respect for Person and Consent**

The principles of respect and consent refer to respecting people and their right to make decisions (DHEW, 2018). Participants were provided informed consent before the education intervention so that they can make their own informed choice about whether to partake in the project (Appendix B). The ethical consent form template was obtained from the University of

Arizona College of Nursing Departmental Review Committee and the UA IRB. The consent was developed for this project and comprised of the following: information about who is conducting the QI project, the purpose of the project, what the participants are being asked to do, the participant time commitment, duration of the project, risk and benefits of participating, and contact information for the project director and the UA IRB office. Participants who engage in this QI project were informed this is was voluntary process, and the information they provided will remain anonymous. Participants were informed they could withdraw from the study and or refuse to answer the survey questions without consequence or penalty. Lastly, participants were informed about where the data was to be stored, safeguarded, and the duration of the data storage.

### **Beneficence**

The beneficence principle refers to an action that promotes benefits for study participants (DHEW, 2018). A possible benefit from this project includes access to a potentially valuable education intervention for the team members who participate in this QI project. This project recommended the implementation of an opioid overdose program at this local setting. The goal was to have participants become more informed about OOD and gain the skill necessary to respond to opioid overdose victims and administer intranasal naloxone therapy thereby, mitigating rates of opioid overdose fatalities. The purpose of this project was not to place any of the participants in physical discomfort, harm, and or unforeseen risks/dangers. There were no known risks for participating in this project. There was no monetary cost required for participation.

## **Justice**

The principles of justice refer to an action that promotes a participant's right to the fairness of treatment (DHEW, 2018). The project director considered fairness in every aspect of the QI project design. All members at the clinic were invited to participate in the study. The PD had the clinical director send recruitment emails to the eligible participants at the clinic to ensure safekeeping of their identity. Participant participation was on a voluntary basis. DOI, the HBM theoretical frameworks, and the PDSA process outlined by the MFI guided the project design. The right to privacy was also a principle of justice recognized in this QI project. Participant information from the project was protected on a password-protected laptop and stored on an encrypted and password-protected University of Arizona cloud-based BOX drive. Only the project director had password-protected access to the collected and de-identified data.

## **Institutional Review Board (IRB) Approval**

Upon receipt of a written agreement by the site administrator to implement this QI project at the clinic, approval from the University of Arizona Institutional Review Board was obtained (UA IRB). The IRB protects the welfare and rights of recruited participants in research activities conducted at institutions. Relevant forms and consents required for approval were completed and sent to the University of Arizona Office of Research and Scholarship c/o Alice Pasvogel in the College of Nursing, followed by a review from the University of Arizona Human Subject Protection Program. The PD received an approval notification letter from IRB (Appendix A). Approval by the UA IRB indicated the QI project may begin; assess, plan, implement, gather information, analyze, train, and make information available to the staff on the topic of the use of intranasal naloxone for use in opioid overdose victims in the clinical setting. The project's

participant information was protected on a password-protected laptop and stored on an encrypted and password-protected University of Arizona College of Nursing cloud-based BOX drive for six years per IRB requirement.

### **Data Collection**

The quantitative methodology used to collect information from respondents in this QI project are pre- and post-survey tools, adapted from Opioid Overdose Knowledge Scale (OOKS) and the Opioid Overdose Attitude Scale (OOAS) (Williams et al., 2013). Developed in 2013 by William et al. (2013), the OOKS scale is a 45-item scale and the OOAS is a 28-item scale (William et al., 2013). Both scales are self-administered, structured questionnaires with multiple-choice, true/false, “don’t know,” and Likert scale items (William et al., 2013). The OOKS and OOAS were created to evaluate knowledge outcomes following a take-home naloxone training (William et al., 2013). When developed, both scales were administered to family members or friends of patients who were heroin users and medical professionals to assess construct validity and internal reliability (William et al., 2013). The OOKS consists of four knowledge domains that assess for risk of opioid overdose, signs of opioid overdose, response to an opioid overdose, and use of naloxone for opioid overdose (William et al., 2013). The OOAS consists of three subscales (competence, concerns, & readiness) that captures attitudes following the take-home naloxone training (William et al., 2013). Evidently, both scales were said to have a strong internal reliability (Cronbach’s alpha = 0.83), repeated test reliability (intra-correlation coefficients (ICC) = 0.90), and concurrent validity ( $r = 0.51$ ;  $P < 0.001$ ) (William et al., 2013). The scales were found to be suitable for assessing outcome measures in pre- and post-training on opioid overdose and take-home naloxone administration (William et al., 2013). The OOKS

scoring is as follows: each correct answer gets one point. Incorrect and “don’t know” responses score zero (William et al., 2013).

### **The OOKS**

A modified version of the OOKS was administered in this project to anonymously assess pre and post knowledge regarding opioid overdose and naloxone administration. A total of 10 survey items comprised of seven multiple-choice, and three true/false questions were selected from the original 45 items of the OOKS and were used to collect responses from participants. The pre and posttest questionnaire from the OOKS were intended to measure the level of knowledge before and after the opioid overdose, education content was delivered to participants. (Appendix D).

### **The OOAS**

A modified version of the OOAS was administered in this project to anonymously evaluate the participants' attitudes before and after the opioid overdose education content. A total of 10, 5 points Likert scale questions were selected from the original 28 items of the OOAS, which uses an accompanying set of responses that typically ranges from a 5 points categorical or ascending scale (e.g., strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, strongly disagree). The pre- and posttest survey from the OOAS was intended to evaluate staff's attitude using the OOAS three subscales related to opioid management: competence (self-ability to manage opioid overdose), concerns (concerns dealing with an opioid overdose), and readiness (willingness to intervene in a witnessed opioid overdose situation).

Questions from the original 45-item OOKS regarding intramuscular naloxone were omitted because the clinic employees were solely trained on intranasal naloxone. Also, an

additional item was added to the OOKS portion of the “risk for opioid overdose” questionnaire because the training course content covers general opioid overdose and not solely heroin. The additional multiple-choice item added was “current use of high dose opioids,” “long history of opioid use,” and “mixing opioids with other substances such as alcohol or sleeping pills.” Both scales have been used in several studies, settings, including law enforcement officers (Klimas et al., 2016; Wagner et al., 2016). The OOKS and OOAS can be downloaded for free on the King’s College London Addiction Department website. Permission to adopt and modify the OOKS and OOAS was obtained from the author, Anna V. Williams, by email correspondence on May 18, 2020 (Appendix D).

### **Demographics**

The demographic survey portion includes seven questions including (1) “Role,” with choices ranges from “Physician,” “Advances Practice,” “Therapies,” “Medical Assistant,” and “Other;” (2) “Age,” with choices from ranges “20 to 30,” “31 to 40,” “41 to 50,” and “51 to older;” (3) “Gender,” with choices ranges from “male,” “female,” “other prefer,” and “prefer not to answer;” (4) “Years of experiences working in a psychiatric/behavioral clinic setting,” with choices ranges from “less than 5 years” and “greater than 5 years;” (5) “Previous experience with substance use disorder,” with ranges from “yes” and “no;” (6) “Previous experience with opioid overdose,” with choices ranges from “yes” and “no;” and finally (7) “Previous training and education on intranasal naloxone,” with ranges from “yes” and “no.”

### **Data Analysis**

The collected data were analyzed. Segmented data were regularly compared against each other and done with Qualtrics coding by assigning a numeric code to each response. Survey

responses from participants was exported from Qualtrics to Excel. The pre- and post-survey results from the multiple-choice including true and false questions were manually tabulated simply by creating a set of indicator (dichotomous mode) variables such as “yes” or “no” for each potential answer and coded as “one” if respondent checked the “yes” box and “zero” if they checked “no.” In order to draw a conclusion from collected data, the project director compared responses between the pre-/post-test to determine participant’s change in test performance in the areas of naloxone knowledge, comfort, attitude, and readiness level. Findings from the descriptive analysis are represented by specific illustrations such as visuals, tables, or figures. The data collection process was tracked and stored using Qualtrics, and the results from the analysis were evaluated.

## **RESULTS**

### **Findings**

The purpose of this section is to present the data analysis process and results, including data from the demographic surveys and pre- and post-surveys, which measured the change in participant knowledge, comfort, attitude, and readiness level to administer naloxone nasal spray following the opioid overdose educational intervention. The project director implemented the asynchronous online educational intervention via the Qualtrics web-based platform and pre- and post-surveys on August 22, 2020. Participants had two weeks to complete the surveys at their convenience. Upon completing the pre- and post-surveys, respondent data were collected via the Qualtrics platform between August 22 to September 6, 2020. All pre- and post-surveys were analyzed and exported from Qualtrics to the Excel platform between September 9 to September 23, 2020. A total of 40 participants were recruited for the educational intervention. Of those,

about seven completed both the pre- and post-surveys for a response rate of 18% and a sample size of seven (n=7). All seven participants achieved a 100% survey completion score, and each offered voluntary consent to participate after reviewing the project disclosure form. No adjustment to the surveys was needed before and after the implementation, based on early response rate. None of the participants left the implementation process, nor did they decline to continue after starting the educational intervention.

### **Participants**

A total of seven (n=7) participants responded to the educational intervention and pre- and post-surveys. Each participant completed the demographic survey, which asked about their age, gender, role, years of psychiatric experience, including substance use disorder, opioid overdose experiences, and previous educational training on intranasal naloxone. Four of the participants were within ages 31 to 40 (57%, N=4), two of the participants within ages 20 to 30 (29%, N=2), and one of the participants between ages 41 to 50 (14%, N=1). Therapist represented the highest proportion of participants (43%, N=3), followed by physicians (29%, N=2). Interestingly and disappointingly, there were no psychiatric nurse practitioner participants in this project (0%) and it is unclear why the nurses and advanced practice nurses chose not to participate. Notably, most of the participants were female (86%, N=6). About 71% of those who participated had less than five years of psychiatric experience (N=5). Of the participants, 86% had previous clinical experience with the treatment of substance use disorder, while 29% had previous clinical experience with treatment of opioid use disorder (N=6, N=2). It is also noteworthy that 43% of those who participated had previous training and education on naloxone nasal spray (N=3) (Table 3).

**Table 3***Outline of Participants Demographic Information*

<b>Indicator</b>	<b>N=7</b>	<b>Percentage</b>
<b>Age</b>		
20 – 30	2	29%
31 – 40	4	57%
41 – 50	1	14%
51+	0	0%
<b>Gender</b>		
Male	1	14%
Female	6	86%
Other	0	0%
Prefer not to answer	0	0%
<b>Role</b>		
Physician	2	29%
Advanced Practice Therapies	0	0%
Medical Assistant	3	43%
Other	1	14%
<b>Years of psychiatric experience</b>		
Less than 5 years	5	71%
Greater than 5 years	2	29%
<b>Previous experience with substance use disorder</b>		
Yes	6	86%
No	1	14%
<b>Previous experience with opioid overdose</b>		
Yes	2	29%
No	5	71%
<b>Previous training and education on intranasal Naloxone</b>		
Yes	3	43%
No	4	57%

**Findings from the OOKS Survey**

The OOKS pre- and post-survey items contained multiple-choice and true/false questions. Each of these components measured the participants' performance and reflected their knowledge around the educational content in the areas of naloxone nasal spray and opioid overdose. A combined knowledge score was computed to represent the number of the overall correct answer for each participant. These summary scores were then analyzed using a cumulative percentage score. For instance, the pretest overall group score for the OOKS earned

98 correct answers out of 126 possible points, while the posttest group got 107 out of 126 possible points. The pretest overall group performance cumulated percentage score was 0.77 (77%). In the posttest, the overall group performance cumulated percentage score was 0.84 (84%), demonstrating a score increase of +0.07 (7%) change. Hence, this increase in the group's performance reflected a notable difference in participants' knowledge after the educational intervention (Table 4).

Following the educational intervention, the participants showed improved knowledge of risk factors, signs and symptoms, the mechanism of naloxone nasal spray, and management of opioid overdose. These specific education intervention components are key educational objectives that offer effective relevant and meaningful content to the clinical and nonclinical staff at BIHC, who will presumably administer the naloxone nasal spray to a patient with a witnessed opioid overdose or to a patient who is suspected of an OOD.

**Table 4**

*Responses of the OOKS Pre- and Post-Surveys*

Outcome 1: Group performance result from the OOKS survey reflecting knowledge change following the intervention			
	Pre-Survey	Post-Survey	Change
	Correct Answers		
<b>Overall OOKS Scores</b>	98/126 = 0.77 (77%)	107/126 = 0.84 (84%)	Score changed and gained + 0.07 (7%) increase in knowledge

### **Findings from the OOAS Survey**

The OOAS consists of a 5-point Likert scale with response options that range from “strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, strongly disagree.” Items from the OOAS measured participant’s comfort, attitude, and readiness to intervene in an overdose scenario before and after the educational intervention. All participants

(n=7) completed both the pre- and post-OOAS surveys. The OOAS responses consisted of both positive and negative options. Positive options were scored 5, 4, 3, 2, 1. For example, if the respondent selects *strongly agree*, the datum for that question is “5,” indicating high comfort, attitude, and readiness to intervene. Scores of “1” (*strongly disagree*) indicate low comfort, attitude, and readiness to intervene. The negative options were reversed and rescored as 1, 2, 3, 4, 5, where a score of “1” is a datum for *strongly agree*. The group summary scores were analyzed using a mean average to determine the change in agreement level for each of the items. An improvement between the group's average, including average greater than ‘4’ or equal on the post-test, determined positive influence on the participant’s comfort, attitude, and readiness before and after the educational intervention.

The first Likert question, “I now have enough information about how to manage an overdose,” mean score changed from 2.57 to 4.42, gaining 1.85 points. This gain indicates respondents agreed that they have adequate information post intervention to manage opioid overdose (Table 5, Question 1)

The second Likert question, “I can administer naloxone nasal spray into someone who had overdosed” mean score changed from 3.28 to 4.57, gaining 1.29 points. This gain indicates that respondents agreed they could administer NNS to a patient with an opioid overdose (Table 5, Question 2)

The third Likert question, “If someone overdoses, I know what to do to help them,” mean score changed from 5.00 to 4.57, losing – 0.43 points. These scores remained consistent, indicating that respondents initially and post-intervention indicating they know what to do to help someone who has an opioid overdose (Table 5, Question 3).

The fourth Likert question, “I would be afraid of doing something wrong in an overdose situation,” mean score changed from 1.85 to 3.85, gaining 2.00 points. This gain reflects respondents felt confident and were not afraid of doing something wrong in managing the care of a patient with an opioid overdose situation (Table 5, Question 4).

The fifth Likert question, “I am going to need more training before I would feel confident to help someone who had overdosed,” mean score changed from 2.28 to 3.26, gaining 1.00 points. This gain indicates participants felt they had enough knowledge and did not need more training before feeling confident to treat and manage the care of a patient who presented with opioid overdose (Table 5, Question 5).

The sixth Likert question, “staff member should be prepared to deal with an overdose,” mean score changed from 4.00 to 4.57, gaining 0.57 points. Both pre- and post-score reflects consistency, and indicated participants agreed that staff members should be clinically prepared to deal with a patient who presents with symptoms of an opioid overdose (Table 5, Question 6).

The seventh Likert question, “If I saw an overdose, I would panic and not be able to help,” mean score changed from 2.14 to 4.28, gaining 2.14 points. This gain reflects a significant participant increase in post-educational responses, and indicates participants were confident that they would not panic and would be able to help in an overdose scenario (Table 5, Question 7).

The eighth Likert question, “nasal spray frightens me, and I wouldn’t be able to give someone intranasal naloxone,” mean score changed from 2.14 to 2.42, gaining 0.28 points. This gain reflects that participants initially and post-intervention felt they would not be frightened to give someone intranasal naloxone (Table 5, Question 8).

The ninth Likert question, “If I saw an overdose, I would feel nervous, but I would still take the necessary actions,” mean score changed from 2.14 to 2.42, gaining 0.28 points. This gain reflects that participants were confident they could remain calm and take necessary actions to intervene during an opioid overdose scenario (Table 5, Question 9).

The tenth Likert question, “I will do whatever is necessary to save someone’s life in an overdose situation,” mean score changed from 4.71 to 4.85, gaining 0.14 points. This gain reflects participants were initially, and post-intervention agreeable and willing to intervene during an opioid overdose situation (Table 5, Question 10).

Lastly, the group overall combined performance mean score changed from 3.24 to 4.13, gaining +0.89 points. This gain reflects improvements in attitude and indicates participants were confident, ready, and willing to intervene in an opioid overdose situation using naloxone nasal spray (Table 5).

**Table 5**

*Responses of the OOAS Pre- and Post-surveys*

<b>Results of Pre and Post Mean Scores from the OOKS Surveys</b>			
	<b>Pre-Survey Mean</b>	<b>Post-Survey Mean</b>	<b>Change</b>
<b>Likert Scale Options:</b> (5) Strongly agree (4) Somewhat agree (3) Neither agree nor disagree (2) Somewhat disagree (1) Strongly disagree			
<b>n=7</b>			
<b>Question 1</b> I now have enough information about how to manage an overdose.	2.57	4.42	+ 1.85
<b>Question 2</b> I can administer Naloxone nasal spray into someone who had overdosed.	3.28	4.57	+ 1.29
<b>Question 3</b> If someone overdoses, I know what to do to help them.	5.00	4.57	+0.43
<b>Question 4</b> I would be afraid of doing something wrong in an overdose situation	1.85	3.85	+ 2.00

**Table 5 – Continued**

	Pre-Survey Mean	Post-Survey Mean	Change
<b>Likert Scale Options:</b> (5) Strongly agree (4) Somewhat agree (3) Neither agree nor disagree (2) Somewhat disagree (1) Strongly disagree			
<b>n=7</b>			
<b>Question 5</b> I am going to need more training before I would feel confident to help someone who had overdosed	2.28	3.28	+1.00
<b>Question 6</b> Staff member should be prepared to deal with an overdose	4.00	4.57	+0.57
<b>Question 7</b> If I saw an overdose, I would panic and not be able to help	2.14	4.28	+2.14
<b>Question 8</b> Nasal spray frightens me, and I wouldn't be able to give someone an intranasal naloxone	4.43	4.57	+0.14
<b>Question 9</b> If I saw an overdose, I would feel nervous, but I would still take the necessary actions	2.14	2.42	+0.28
<b>Question 10</b> I will do whatever is necessary to save someone's life in an overdose situation	4.71	4.85	+0.14
<b>Combined group mean performances Questions =10-items</b>	32.4/10 = 3.24	41.34/10=4.13	+0.89

### Scholarly Project Evaluation and Outcomes

This QI project outcome was intended to provide clinical providers, and nonclinical staff at BIHC targeted education to increase their baseline knowledge, comfort, attitude, and readiness to use NNS in OOD treatment. The educational intervention's effectiveness was compared by evaluating pre- and post-OOKS and OOAS surveys completed by each participant. During the implementation process, recruitment emails were sent out to BIHC employees by the clinic's clinical supervisor to ensure their identity remains anonymous. There were some changes to the implementation timeline after learning participants had received their invitations two weeks in advance instead of the three week proposed timeline. Throughout the data analysis process, both

OOKS and OOAS survey responses were examined thoroughly to ensure accuracy of participant responses. While analyzing the surveys, this PD learned that two of the OOAS Likert scale items were negatively worded questions that require ordering the scale from positive options (i.e., strongly disagree ... strongly agree) to the opposite way around (i.e., strongly agree ... strongly disagree). In conclusion this QI project was successful at meeting its intended goal and results from this QI project definitely confirm a positive impact and greater knowledge dissemination on the use of NNS for the treatment of opioid overdose was achieved among project participants at this practice site.

## **DISCUSSION**

### **Summary**

The opioid overdose deaths continue to impact communities across the US significantly. Data shows that 128 people in the US die every day after overdosing on opioids, including claiming two lives each day in the state of Arizona (2018) (AZDHS, 2019a; National Institute of Drug Abuse [NIDA], 2020). The misuse of opioids, including heroin, illicit fentanyl, and OPR, is a severe national crisis decreasing the quality of the public's health as well as social and economic welfare (CDC, 2020; Green & Doe-Simkinsc, 2016; Kolodny et al., 2015; NIDA, 2020). With more people struggling with opioid addiction and increasing risks associated with opioid overdose, EB intervention such as NNS, a life-saving medication that restores a person's respiration and blocks the effect of overdose, has been shown to significantly decrease OOD mortality (Avetian et al., 2018, Phillips et al., 2017). Though evidence demonstrates NNS's effectiveness, some studies identified an existing knowledge gap on OOD and NNS's use among bystanders in nonclinical settings (Avetian et al., 2018; Giglio, Li, & DiMaggio, 2015).

With the given implication of the ongoing problems, this QI project sought to implement education as a means to improve baseline knowledge, comfort, attitude, and readiness of clinical and nonclinical staff on the use of NNS in the treatment of OOD. This effort aimed to help close the knowledge gap and provide staff and clinicians in this local setting with the skills necessary to provide comfortable and effective interventions. Implementation of this project took place at the BIHC clinic in South Phoenix. At least seven eligible employees that work at BIHC participated. The implementation of this project took about two weeks. The education content's effectiveness, including knowledge, comfort, attitude, and readiness to intervene, was evaluated using self-administered OOKS and OOAS in pre- and post-survey responses. Data analysis of each respondent's completed survey results was conducted to determine if education intervention was effective. The pre- and post-surveys' key findings supported and further illuminated the efficacy of the education intervention on the clinical and nonclinical staff's knowledge, comfort, attitude, and readiness to intervene.

Additionally, an encouraging key finding was the positive result of the participant's group performance in the OOKS survey, which found increased knowledge from a score of 77% in pre-survey to 84% in post-surveys related to NNS use in the treatment of OOD. The goal to improve knowledge was successfully achieved, with a higher score on the OOKS post survey and a gained raw percentage score of +7% noted in the change in knowledge. Another key finding was positive results of participants group performance in the OOAS survey, which revealed improved comfort attitude and readiness to intervene from a mean average score of 3.24 in the pre-survey to 4.13 in the post-survey. The goal to increase comfort, attitude, and readiness was successfully achieved with a high posttest group performance mean average equal to or

greater than 4.13 and a gained score of +0.89 noted in the change. The clinical and nonclinical staff at BIHC clinic became familiar with NNS's use in OOD treatment because of this newly gained knowledge. Evaluation of the data analysis obtained from this QI project and other EB literature indicated that OOD and NNS education training effectively increased knowledge, comfort, attitude, and readiness to intervene in an OOD situation.

### **Interpretation**

Data analysis of pre- and post-surveys was compared to determine the effectiveness of the educational intervention on the participant's knowledge, comfort, attitude, and readiness related to NNS's use in OOD treatment. Data from the 10 items OOKS multiple-choice questions measured participant's knowledge of the training content. Responses from the OOKS questions were analyzed using dichotomous scoring, "yes" (1) for correct answers, and "no" (0) for incorrect answers to reflect how each participant generally understood the 10 items questions. The summary scores were then compared to get the percentage of correct responses between the pre-/post-test to determine participant's change in knowledge.

Table 4 summarizes the group's average scores from the pre- and post-survey items of the OOKS survey. The responses to the survey item reflected the clinical providers and nonclinical staff's knowledge about the education content, which indicate the staff had a good understanding and improved knowledge of the scope and seriousness of the opioid epidemic, types of opioids, risk factors, signs of OOD, NNS administration, safety information on NNS, and the Good Samaritan OOD laws. All of these components are required to effectively intervene in an OOD situation.

Data from the 10 item Likert scale questions measured the participant's comfort, attitude, and readiness to use NNS in OOD treatment. The results of each item's questions are summarized in Table 5. A mean average score of the group's response greater than '4' or equal on the post-test determined positive influence on the participant's comfort, attitude, and readiness to intervene. Significant changes in the clinical and nonclinical staff's responses from the pre- to the post-survey following the education intervention were present in all 10-item OOAS questions. There were improvements between the group's mean score, including average scores greater than '4' (Table 5). Participant's pre- and post OOAS mean scores reflected increased comfort, attitude, and readiness to use the NNS to treat OOD post-intervention. Participant's scores reflected that they felt satisfied with OOD training on NNS's use in OOD treatment. Participants were comfortable to help someone in an OOD situation. Participants were not afraid to do something wrong in an OOD situation. Participants felt they didn't need more training to intervene and felt ready to help someone with OOD. Participants agreed they should be prepared to deal with an OOD incident. Participants felt prepared to help in an OOD situation and would not panic. Participants were comfortable administering NNS and are not frightened to intervene in an OOD situation. Participants felt ready to take the necessary actions to intervene in OOD. Participants were ready to do whatever is needed to save someone's life in an OOD situation (Table 5).

### **Comparison of Findings to Framework**

The findings fall within the health belief model (HBM), highlighting the need to promote education so that individuals can take necessary health-related positive actions to avoid negatives health issues (Janz & Becker, 1984). According to the HBM, the intent to accomplish behavioral

change profoundly depends on the messages that are being promoted and if the messages target the individual's perceived severity about the significance of health issue, self-efficacy to take actions, obstacles hindering their ability to take actions, and the advantage in taking necessary action to mitigate the health issue (Janz & Becker, 1984). The QI project was designed to promote and offer EB education on NNS's use in OOD treatment to demonstrate participant likelihood of adopting clinical practices and actions necessary to save lives. Given the analysis obtained from this QI study pre- and post-OOKS and OOAS surveys, the findings of both OOAS and OOKS post-intervention scores fit into the framework of the HBM and demonstrated the OOD education program was indeed an effective educational intervention and the approach of this QI project offered an increase in knowledge, comfort, attitude, and readiness to use the NNS in treatment of OOD.

### **Comparison of Findings to Literature**

One striking confirmation of this project when compared to other EB literature was that OOD education effectively increased knowledge, comfort, attitude, and readiness to intervene in an OOD situation (Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2015; Ray et al., 2015).

### **Implications**

The outcomes demonstrated from the QI study revealed that education effectively increased clinical providers and nonclinical staff's knowledge, comfort, attitude, and readiness to use the NNS in OOD treatment. The QI study findings suggested that a knowledge gap existed in opioid overdose education. Additionally, findings from the study and current literature further suggested education played a critical role in closing the knowledge gap (Ashrafioun et al., 2016;

Giglio et al., 2015; Klimas et al., 2015; Ray et al., 2015). Opioid overdose education and the use of NNS is an integral part of this harm reduction effort which is intended to improve the general public health in response to the existing opiate crisis in the nation. This project also was successful in expanding staff and healthcare worker knowledge, comfort, attitude, and readiness to intervene in OOD situation (Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2015; Ray et al., 2015).

This QI project was implemented at an integrated outpatient clinic that focuses on the opioid crisis and provides services to patients with substance use disorder in the Phoenix South Mountain region (APTN, n.d.). After the implementation and data analysis process, this PD provided an executive summary to the local clinic administrators on the findings and the change in staff's baseline knowledge, comfort, attitude, and readiness level to use NNS in OOD treatment. With the increasing number of OOD deaths in the US communities, policies makers and administrators at BIHC appreciated the new knowledge gained by staff and clinicians and they embraced the opportunity to contribute to the harm reduction effort to prevent further OOD fatality in the US communities by considering the option to make NNS readily available in their clinical setting (Hawk et al., 2015).

To mention, the BIHC clinic did not have an opioid overdose education training policy and only had access to one emergency naloxone nasal spray kit. The PD formally recommended the clinical facility to implement emergency response policies that require all staff to initiate NNS administration in OOD treatment. Naloxone nasal spray significantly decreases OOD deaths when administered early (Avetian et al., 2018). Thirty-six states, including Arizona, have passed an overdose "Good Samaritan" law that permits any individual to administer NNS to

someone in an OOD situation in good faith and provides immunity from criminal prosecution (AZDHS, 2017; Gabay, 2016; Nadelmann & LaSalle, 2017). Secondly, this PD recommended an ongoing annual OOD training program that will require staff and clinicians to maintain hands-on practice or in-person skills assessment on the use of the NNS and assessment of OOD once a year. Creating an opioid overdose policy is timely and should be implemented as the results of this QI project demonstrates clinical and staff team member support after key team members received the targeted education intervention in this QI project.

This study was a much smaller, local intervention and equips a small clinical setting to begin to address the national and global opiate crisis. Implementation of similar QI projects and interventions may vary widely depending on the participants, local laws, and regulations. These next steps, post this QI project, are to explore whether evidence-based OOD education interventions will impact patient outcomes in communities, clinic, state, and national levels by a reduction in opioid overdose related deaths. Nonetheless, the fact remains that OOD deaths are on the rise, and EB education on NNS's use in the treatment of ODD is of highest priority and can be an effective practice intervention that can address and target the opioid pandemic.

### **Limitations and Project Barriers**

This section describes some of the limitations experienced in this QI project. Participants were recruited purposively and conveniently via the clinic's directory email and the recruitment email was sent by a designated clinical leader. Therefore, a significant barrier to recruitment for this project was that recruitment emails only reached those who regularly check emails and have stable and reliable access to phone or computer devices. Another impediment was the low participation of only seven participants who participated in this QI project. Limited participation

and may have been due to the unpredictable global COVID-19 pandemic and restrictive circumstances. The anticipated goal of this project was to recruit at least 12 eligible participants. Of the 12 participants, seven (58%) staff completed the education intervention and pre- and post-surveys. Therefore, this QI project had a small sample size which is not a reliable reflection of participant impressions, are not generalizable and may result in higher participant response variability (Polit & Beck, 2017). Another interesting finding was the distribution between male and female participants. Females accounted for 86% of the participants; therefore, the uneven distribution is reflective of a mainly female perspective and future project should strive for a more equal gender demographic (Polit & Beck, 2017). There was also the risk of response bias since the pre and post surveys information was self-report. Outcome based self-report OOAS Likert type questions (i.e., strongly disagree ... strongly agree) may affect an individual differently depending on the circumstances such as stressors, distractions, or workload they may be experiencing at the time of information delivery.

To improve participant recruitment, three recruitment emails were sent out to remind staff to participate and complete the intervention session before the deadline however only seven participants were recruited so perhaps a different recruitment strategy would have been beneficial. Participants were given two weeks' duration to complete the education intervention to increase participant access and convenience however the online learning format may have hindered the quality of the intervention and quality of the delivery format should be explored in future projects of this type. The education content and surveys were available on several devices such as tablets, laptops, computers, and phones and it is important to note that some participants

may be limited in comfort and access to computer-based learning and survey completion so having a paper option may be beneficial for future projects of this type.

### **The Impact of COVID-19 on this Quality Improvement Project**

The COVID-19 respiratory disease is an ongoing global pandemic that created some disruptions in this QI project's pre-implementation phase. Sadly, due to COVID-19, nationwide mandatory lockdown measures were imposed which resulted in closure of businesses, schools, clinics, or any activities that required large gatherings. This QI project and the entire implementation plan at this local site, BIHC clinic, was impacted by COVID-19.

After the nationwide lockdown, this PD had difficulties implementing the education intervention which was initially designed to facilitate in-person training for clinical providers and nonclinical staff at the BIHC clinic. The recruitment process was impacted, which led to the discontinuation of paper flyers, word of mouth, and physical signup sheets. COVID-19 restrictions prevented participant's opportunities to perform in-person hands-on training on manikin heads to become familiarized with the NNS product. COVID-19 affected participant's chances to have in-person question and answer sessions about the educational content to clarify any misunderstanding or address any questions they may have had. COVID-19 impacted participant's opportunities to receive lunch as part of their incentive for participating in the project. The incentive meal would have offered lunch, donuts, and refreshment drinks.

Additionally, COVID-19 impacted the self-administered pre- and post-survey method. Before COVID-19, the pre- and post-surveys were initially designed to be administered via a paper form in two sealed envelopes. The pre- and post-paper survey had an assigned

identification number encrypted on the top right side of the form to compare for analysis. All elements of the QI project had to be modified and delivered electronically.

Some modifications were necessitated to facilitate smooth implementation. The impact of COVID-19 precipitated this PD to modify the recruitment process. Participants were recruited by email. The email contained instructions and electronic flyers inviting staff to participate. The PD appointed the clinical supervisor at BIHC clinic to send out recruitment emails and ensure their identity remained anonymous. Next, the education content was delivered via asynchronous learning style. Participants were provided with this PD contact information to ask questions after reviewing the education content. Lastly, pre- and post-surveys were administered online through a Qualtrics survey administration platform. There were no rewards provided for participation. Nonetheless, the QI project was successfully implemented.

### **DNP Essentials Addressed**

The American Association of Colleges of Nursing (AACN) developed the *Essentials of Doctoral Education for Advanced Nursing Practice* to ensure that doctoral students adhere to the DNP educational curriculum needed to graduate (AACN, 2006). Throughout this DNP project, the AACN Essentials were considered and included.

One of the Essential components addressed in this DNP project is *DNP Essential III: Clinical Scholarship and Analytical Methods for Evidence Based Practice*, highlights integrating scholarship and research as the hallmark of doctoral education (AACN, 2006). This PD began using literature reviews to obtain evidence-based research that supports the DNP project's intended outcome (AACN, 2006). Next, the PD employed an analytical method to critically appraise EB literature to apply relevant knowledge that is crucial and effective for fulfilling this

project outcome. This PD devised and implemented quality improvement methodologies, including designing an EB education intervention to improve the project outcomes. Next, this PD perceived that educating clinical providers and nonclinical staff on OOD's adverse health-related impact is critical for targeting and mitigating OOD fatalities (Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2015; Ray et al., 2015). Lastly, this PD successfully disseminated this project outcome to the BIHC clinic to allow efficient OOD treatment in the clinics and community.

The second Essential component addressed in this DNP project is the *DNP Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes*, which emphasize facilitating collaborative team functioning among multiple professions with highly knowledgeable skills (AACN, 2006). Before implementing this QI project, this PD applied effective communication and collaborative skills to work with some BIHC stakeholders. Next, this PD analyzed the organizational issues and gathered feedback necessary to implement this QI project successfully.

The third Essential component addressed *DNP Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health*, highlighting the importance of health promotion and risk reduction for individuals (AACN, 2006). In the US, the FDA, ONDCP, reformers, legislators, and community organizations have played a meaningful role in promoting harm reduction strategies to combat the US OOD crisis (Gabay, 2016; Hawk et al., 2015; Nadelmann & LaSalle, 2017). The implementation of this DNP project was centered around the nationwide response to the OOD crisis and support to promote harm reduction strategies. This PD employed education as one of the harm reduction efforts designed to make the clinical and

nonclinical staff aware of NNS's use in the treatment of OOD (Hawk et al., 2015). However, this harm reduction strategy on its own was significant, effective implementing of the QI study is necessary for reducing the number of individuals damaged by the severity of OOD.

### **Conclusions**

Opioid overdose is a public health concern that requires a harm reduction approach, including naloxone distribution and increasing bystanders' involvement in mitigating OOD deaths thereby, improving the quality of the public's health, and social and economic welfare in the US communities (Hawk et al., 2015). The results of this study and other evidence-based literature indicate that harm reduction approaches such as education intervention can close the knowledge gap, reduce stigma, and improve attitudes, among the general public, including healthcare workers, on the use of NNS in the treatment of OOD (Ashrafioun et al., 2016; Giglio et al., 2015; Klimas et al., 2015; Ray et al., 2015). This project's outcomes reinforce the importance of education as an effective intervention proven to increase baseline knowledge, comfort, attitude, and readiness to intervene in the OOD situation.

### **Plan for Sustainability**

The impact of this study implementation allowed BIHC staff to understand harm reduction measures to mitigate OOD fatalities at their clinic setting. Moving forward, this education intervention can continue to be implemented at BIHC clinical site and for future use at the other BIHC clinics located in the Phoenix area. This evidence-based education intervention will provide hope for all the 34 – 43 million Americans who continue to misuse prescriptions OPRs and the 80% that transition to heroin and manufactured illicit fentanyl (NIDA, 2020).

Additionally, the BIHC clinic site administrators consider implementing OOD emergency response policies, including having more than one emergency NNS kit at the clinical site. Administrators are also thinking of using this study's evidence-based education content to provide ongoing yearly training to their employees and new hires.

### **Plan for Dissemination**

While BIHC clinic stakeholders directly received the benefits of this QI project, the most incredible opportunity for dissemination of the results of this project is the willingness of the BIHC South Mountain clinic's clinical supervisor to share the findings from this QI project with the entire BIHC clinical network. This support to disseminate the results widely, were realized following discussion about the project results, sharing experiences, reviewing the findings, and after sharing the executive summary of the QI project with the key stakeholders at BIHC. This project director will continue to encourage ongoing dialog with the BIHC clinics to identify ongoing needs and education on NNS's use in OOD treatment. The results from this QI project may also be submitted for publication, poster presentation at conferences and general dissemination in hopes of reaching a wider group of practicing healthcare providers, clinical staff and team members who practice in similar clinical settings or who are interested in addressing the opioid crisis at the local clinical level.

APPENDIX A:  
BAYLESS INTEGRATED HEALTHCARE SITE APPROVAL/THE INSTITUTIONAL  
REVIEW BOARD LETTER



June 18, 2020

University of Arizona Institutional Review Board

c/o Office of Human Subjects

1618 E Helen St

Tucson, AZ 85721

Please note that Ms. Mercy Omijie, UA Doctor of Nursing Practice student, has permission of the Bayless Integrated Healthcenter to conduct a quality improvement project at our facility for her project, "Education on Naloxone Nasal Spray Treatment for Bayless Integrated Health Center."

Ms. Omijie will conduct a survey of employees at Bayless Integrated Healthcenter. She will recruit employees through email. The email will provide a description of the project, what they will be asked to do, the time involved, and a link to the online survey. Ms. Omijie's activities will be completed by *October 30<sup>th</sup>, 2020*

Ms. Omijie has agreed to provide to my office a copy of the University of Arizona Determination before she recruits participants. She will also present aggregate results to the providers at their staff meeting.

If you have any questions please feel free to call our office – 602 230-7373.

Collaboratively,

A handwritten signature in black ink that reads "Fong, DNP". The signature is stylized and written in a cursive-like font.

Dr. Fong, DNP PMHNP-BC  
Psychiatric Nurse Practitioner Supervisor

**Bayless Integrated Healthcare**  
9014 S. Central Ave  
Phoenix, Arizona 85042  
Family Medicine • Emotional & Behavioral Health • Social Health  
baylesshealthcare.com



Human Subjects  
Protection Program

1618 E. Helen St.  
P.O. Box 245137  
Tucson, AZ 85724-5137  
Tel: (520) 626-6721  
<http://hgw.arizona.edu/compliance/home>

**Date:** July 24, 2020

**Principal Investigator:** Mercy Omijie

---

**Protocol Number:** 2007881485

**Protocol Title:** EDUCATION ON NALOXONE NASAL SPRAY EMERGENCY TREATMENT AT BAYLESS INTEGRATED HEALTH CENTER

---

**Determination:** Human Subjects Review not Required

---

**Documents Reviewed Concurrently:**

**HSPF Forms/Correspondence:** *Omijie\_DNP Project IRB determination form pdf.pdf*

**Regulatory Determinations/Comments:**

- ♦ Not Research as defined by 45 CFR 46.102(l): As presented, the activities described above do not meet the definition of research cited in the regulations issued by U.S. Department of Health and Human Services which state that "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPF) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPF to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX B:  
CONSENT DOCUMENT (DISCLOSURE FORM)

## Disclosure Form

### Naloxone Nasal Spray Training at Bayless Health Care Center

My name is Mercy Omijie, and I am a graduate student at the University of Arizona. I am currently working on my Doctor of Nurse Practice Quality Improvement Project here at Bayless Healthcare Center and would like to begin recruiting participants for this project. However, I will need your help.

The primary purpose of this project is to provide all staff at Bayless an educational session on Opioid Overdose and how to administer naloxone nasal spray in a situation where an opioid overdose is witnessed at Bayless Integrated Health Center.

If you choose to take part in this project, you will be asked to participate in a survey and web-based educational content. There is a pretest and a posttest following the educational content. It will take approximately 45 minutes to complete the educational content, including the pre- and post-surveys. There are no foreseeable risks associated with participating in this project, and you will receive no immediate benefit from your participation. Survey responses are anonymous.

If you choose to participate in this project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may e-mail Mercy Omijie RN, BSN, PHMNP-DNP Student at [momijie@email.arizona.edu](mailto:momijie@email.arizona.edu) or (206) 683-5201.

APPENDIX C:  
RECRUITMENT MATERIAL (RECRUITMENT FLYER)



**YOU'RE INVITED!**

## **WEB-BASED TRAINING ON NALOXONE FOR OPIOID OVERDOSE**

I am pleased to announce my Doctoral Nurse Practitioner project web-based training. The training will focus on how to resuscitate an opioid overdose victim in an outpatient clinic. Come learn more about the risk and symptoms of opioid overdose, first aid naloxone therapy, and how good Samaritan overdose law protects your good act.

**Web-Based  
Training**

**Topic:  
“Naloxone  
Training for  
Opioid Overdose”**

**September TBD,  
2020**

**Online reward will  
be available,  
while you  
participate in the  
training at your  
convenience**

**FOR MORE INFORMATION,  
CONTACT...**

Mercy Omijie, DNP-PMHNP  
Candidate  
2066835201

[momijie@email.arizona.edu](mailto:momijie@email.arizona.edu)

APPENDIX D:

EVALUATION INSTRUMENTS (APPROVAL TO USE OOKS INSTRUMENT AND OOAS  
SCALE INSTRUMENTS/PRETEST QUESTIONNAIRE/PRETEST SURVEY/ POSTTEST  
SURVEY)

Letter Seeking Permission to Use Opioid Overdose Knowledge Scale (OOKS) and Opioid  
Overdose Attitude Scale (OOAS) Instruments

Name: Mercy Omijie, BSN (Nursing), DNP-PMHNP (student)  
Institution: University of Arizona  
Department: Nursing  
Address: 1305 N Martin Avenue  
Tucson, AZ 85721-0202

Dear Madam:

I am currently a graduate student from the University of Arizona, writing my Doctor of Nurse Practice Quality Improvement Project titled, "**Naloxone Nasal Spray Training at Bayless Healthcare Center.**" Under the direction of my project committee chaired by Dr. Michelle Kahn-John, who can be reached at e-mail: [mkahnjohn@email.arizona.edu](mailto:mkahnjohn@email.arizona.edu)

In this connection, I am humbly asking permission to use the OOAS and OOKS instrument for my DNP project under the following conditions:

- I will only use the instrument for my QI project and will not sell or use it with any compensated or curriculum activities.
- I will include the copyright statement on all copies of the instrument.
- I will use some parts of the instruments due to the limited time available for participants to complete the survey
- I will omit a few questions because the participants using the tool will solely be trained on intranasal Naloxone.
- I will modify a few words in the instrument so that it's not solely for heroin but all opioids

If this is acceptable, can you please indicate so by replying to me through e-mail:  
[momijie@email.arizona.edu](mailto:momijie@email.arizona.edu)

Sincerely,

Mercy Omijie  
2018 DNP - PMHNP Cohort

## Authorization to Use Opioid Overdose Knowledge Scale (OOKS) and Opioid Overdose Attitude Scale (OOAS) Instruments



**Williams, Anna** <anna.v.williams@kcl.ac.uk>  
to me ▾

Mon, May 18, 9:39 AM



**External Email**

Dear Mercy Omijie

Thank you for seeking permission to use the scales.  
You have permission to use it.

Best wishes,  
Anna

Dr Anna V. Williams

Program leader International Master of Science in Addiction Studies (IPAS)  
Teaching Fellow and Honorary Lecturer at King's College London

Addictions Department, Institute of Psychiatry Psychology and Neuroscience  
King's College London  
4, Windsor Walk  
Denmark Hill  
London, UK  
SE5 8AF

T: +44 (0)78 4745 6305  
Skype: annawilliamsipas  
Facebook: [www.facebook.com/ipas/msc](http://www.facebook.com/ipas/msc)  
Visit the IPAS webpage: [www.ipas.vcu.edu](http://www.ipas.vcu.edu)

## Pretest Questionnaires

Please complete the following:

***Demographic Information:***

1. **Age**  
(1) 20 – 30 (2) 31 – 40 (3) 41 – 50 (4) 51 and older
2. **Gender**  
(1) male (2) female (3) other prefer (4) prefer not to answer
3. **Role**  
(1) Physician (2) Advance Practice (3) Therapies  
(4) Medical Assistant (5) Other
4. **Years of psychiatric experience**  
(1) less than 5 years (2) greater than 5 years
5. **I have previous experience with substance use disorder**  
(1) yes (2) no
6. **I have had previous experience with opioid overdose:**  
(1) yes (2) no
7. **I have had previous training and education on intranasal Naloxone**  
(1) yes (2) no

## Pretest Survey

*Please select all that apply to the following questions.*

**1. Which of the following factors increase the risk of opioid overdose?**

1. Switching from smoking to injecting heroin
2. Using opioids with other substances, such as alcohol or sleeping pills
3. A long history of heroin use
4. Using heroin again after a detox treatment

**2. Which of the following are indicators (signs) of an opioid overdose?**

1. Slow/shallow breathing
2. Lips, hands, or feet turning blue
3. Pinpoint pupils
4. Unresponsive

**3. Which of the following should be done when managing an opioid overdose?**

1. Call an ambulance
2. Stay with the person until an ambulance arrives
3. Give stimulants (e.g. cocaine or black coffee)
4. Give Naloxone (opioid antidote)

**4. What is Naloxone used for?**

1. To reverse the effects of an opioid overdose (e.g. heroin, methadone)
2. To reverse the effects of an amphetamine overdose
3. To reverse the effects of any overdose

**5. How can intranasal Naloxone be administered?**

1. Into a nose (intranasal)
2. Into the eyes (ophthalmic)
3. Swallowing- liquid

**6. How long does intranasal Naloxone takes to start having effect?**

1. 2-5 minutes
2. 5-10 minutes
3. Don't know

**7. How long do the effects of intranasal Naloxone last for?**

1. Less than 20 minutes
2. About one hour
3. 1 to 6 hours
4. Don't know

**8. If the first dose of Naloxone has no effect a second dose can be given**

- True
- Neither true nor false
- False

**9. Someone can overdose again even after having received naloxone**

- True
- Neither true nor false
- False

**10. Naloxone can provoke withdrawal symptoms**

- True
- Neither true nor false
- False

**Please, mark how much you agree with each statement:**

**1. I already have enough information about how to manage an overdose**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**2. I am already able to administer naloxone nasal spray into someone who had overdosed**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**3. If someone overdoses, I want to be able to help them**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**4. I would be afraid of doing something wrong in an overdose situation**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**5. I am going to need more training before I would feel confident to help someone who had overdosed**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**6. Staff member should be prepared to deal with an overdose**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**7. If I saw an overdose, I would panic and not be able to help**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**8. Nasal spray frightens me, and I wouldn't be able to give someone an intranasal naloxone**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**9. If I saw an overdose, I would feel nervous, but I would still take the necessary actions**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**10. I will do whatever is necessary to save someone's life in an overdose situation**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

*Note. This survey items have been adapted from "Development of Opioid Overdose Knowledge (OOKS) and Attitudes (OOAS) Scales for take-home naloxone training evaluation" by Anna Williams, John Strang and John Marsden from the Addictions Department, Institute of Psychiatry and Psychology and Neuroscience, King's College London in 2013. Drug Alcohol Dependence.132(1-2):383-6. <http://dx.doi.org/http://dx.doi.org/10.1016/j.drugalsdep>.*

## Posttest Survey

*Please select all that apply to the following questions.*

**1. Which of the following factors increase the risk of opioid overdose?**

1. Switching from smoking to injecting heroin
2. Using opioids with other substances, such as alcohol or sleeping pills
3. A long history of heroin use
4. Using heroin again after a detox treatment

**2. Which of the following are indicators (signs) of an opioid overdose?**

1. Slow/shallow breathing
2. Lips, hands, or feet turning blue
3. Pinpoint pupils
4. Unresponsive

**3. Which of the following should be done when managing an opioid overdose?**

1. Call an ambulance
2. Stay with the person until an ambulance arrives
3. Give stimulants (e.g. cocaine or black coffee)
4. Give Naloxone (opioid antidote)

**4. What is Naloxone used for?**

1. To reverse the effects of an opioid overdose (e.g. heroin, methadone)
2. To reverse the effects of an amphetamine overdose
3. To reverse the effects of any overdose

**5. How can intranasal Naloxone be administered?**

1. Into a nose (intranasal)
2. Into the eyes (ophthalmic)
3. Swallowing- liquid

**6. How long does intranasal Naloxone takes to start having effect?**

1. 2-5 minutes
2. 5-10 minutes
3. Don't know

**7. How long do the effects of intranasal Naloxone last for?**

1. Less than 20 minutes
2. About one hour
3. 1 to 6 hours
4. Don't know

**8. If the first dose of Naloxone has no effect a second dose can be given**

- True
- Neither true nor false
- False

**9. Someone can overdose again even after having received naloxone?**

- True
- Neither true nor false
- False

**10. Naloxone can provoke withdrawal symptoms?**

- True
- Neither true nor false
- False

**Please, mark how much you agree with each statement:**

**1. I now have enough information about how to manage an overdose**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**2. I can administer Naloxone nasal spray into someone who had overdosed**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**3. If someone overdoses, I know what to do to help them**

(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

**4. I would be afraid of doing something wrong in an overdose situation**

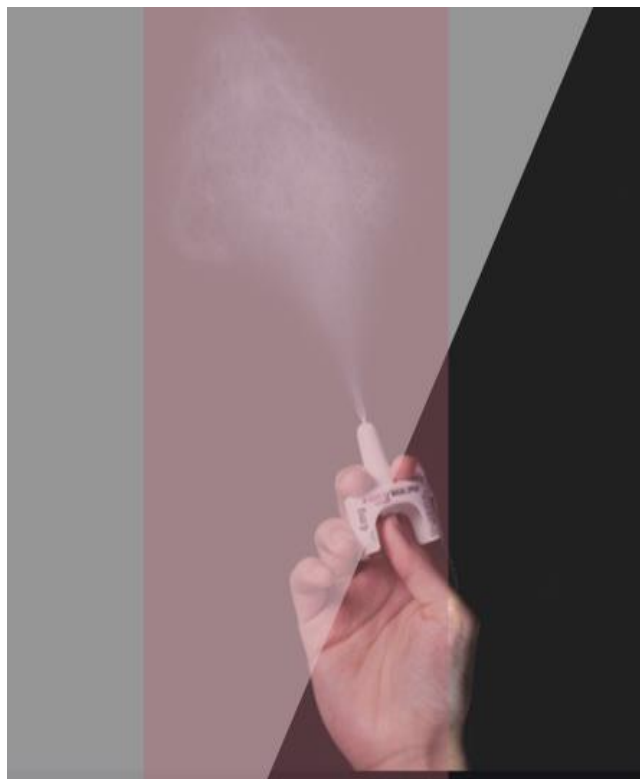
(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

- 5. I am going to need more training before I would feel confident to help someone who had overdosed**  
(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree
- 6. Staff member should be prepared to deal with an overdose**  
(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree
- 7. If I saw an overdose, I would panic and not be able to help**  
(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree
- 8. Nasal spray frightens me, and I wouldn't be able to give someone an intranasal naloxone**  
(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree
- 9. If I saw an overdose, I would feel nervous, but I would still take the necessary actions**  
(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree
- 10. I will do whatever is necessary to save someone's life in an overdose situation**  
(1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree (4) Somewhat disagree 5) Strongly disagree

*Note.* This survey items have been adapted from "Development of Opioid Overdose Knowledge (OOKS) and Attitudes (OOAS) Scales for take-home naloxone training evaluation" by Anna Williams, John Strang and John Marsden from the Addictions Department, Institute of Psychiatry and Psychology and Neuroscience, King's College London in 2013. *Drug Alcohol Dependence*.132(1-2):383-6. <http://dx.doi.org/http://dx.doi.org/10.1016/j.drugalsdep>.

APPENDIX E:

PARTICIPANT MATERIAL (POWERPOINT PRESENTATION/PRESENTATION POSTER)



# NALOXONE TRAINING FOR OPIOID OVERDOSE



Mercy Omijie, DNP-PMHNP Candidate

## Objectives



- ❖ Background
- ❖ Types of Opioids
- ❖ Opioids Effects
- ❖ Risk of Opioid Overdose
- ❖ Symptoms of Opioid Overdose
- ❖ Treatment for Opioid Overdose
- ❖ How to Administer Naloxone spray
- ❖ Safety Information on Naloxone Spray
- ❖ Good Samaritan Overdose Law
- ❖ Brief Video about Naloxone



## Background



### The Opioid Epidemic in 2015 – 2017\*

- ❖ Opioid overdose is the **leading** cause of **unintentional injury death** in America.
- ❖ **70,000** opioid overdose related deaths.
- ❖ Opioids include legal prescription and illegal drugs.
- ❖ **2 million** people misused opioid prescription.
- ❖ **4 to 6 percent** of opioid prescription users transitioned to Heroin.
- ❖ Often people use heroin because it's less costly than opioid prescriptions.



3

## Background



4

## Types of Opioids

### What are opioids?

- Medicine used to treat pain.

Opium	Hydrocodone
Morphine	Oxycodone
Codeine	Fentanyl
Heroin	Methadone

5

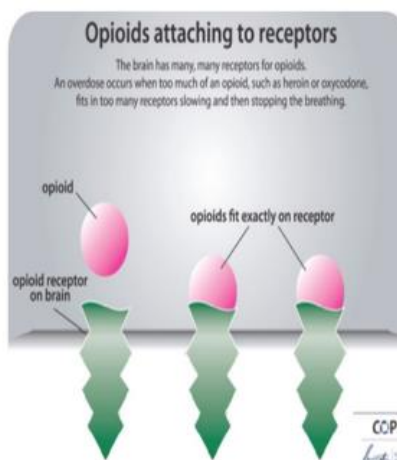
## Opioids Effects

### What happens when you take an opioid?



- Opioids act as a depressant on the Central Nervous system (CNS), Respiratory System, and the Cardiovascular System

- Decrease level of conscious
- Decreases respiratory drive
- Decrease heart rate and blood pressure
- "Slows" everything down



6

## Who is at Risk for Opioid Overdose?



Switching from smoking to injecting heroin

Using opioids with other substances, such as alcohol or sleeping pills

Using heroin again after a detox treatment or soon after prison

Streets drugs being laced with fentanyl

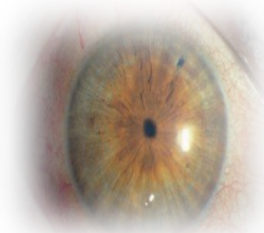
A long history of heroin use

Using heroin when no one else is around alone

7

## Signs and Symptoms of Opioid Overdose

- 🚑 • Slow/shallow breathing
- Lips, hands or feet turning blue
- Loss of consciousness
- Unresponsive
- Blue/pale skin, lips, nails
- Choking, gurgling, snoring sound
- Pinpoint/Very small pupils
- Very limp body



## Treatment for Opioid Overdose

### What is Naloxone?

- ❖ Naloxone is used to rapidly **reverse** the **effects** of an **opioid** overdose (e.g. heroin, methadone)
- ❖ Narcan is the brand name of naloxone.
- ❖ Restores normal respiration to a person whose breathing has slowed or stopped as a result of overdosing with an opioid.



9

## Treatment for Opioid Overdose

### 4 Types of Naloxone



## Treatment for Opioid Overdose

### Naloxone that we will be using at Bayless

#### ❖ NARCAN NASAL SPRAY

FDA- approved for INTRANASAL use only

**EMERGENCY** therapy for suspected opioid related overdose

- ❖ Reverse the effect of opioid overdose

Formula: **4mg** dose; 1 spray

- ❖ Takes 2 -5 minutes to work

Not a controlled substance

Repeated dose may be necessary

Effect **Last** for about an Hour

Safe in kids, Adults & Pregnant women

- ❖ Get medical help (**911**) right away



11

## How to Respond & Administer Naloxone

**1 Identify Opioid Overdose and Check for Response**

**ASK** person if he or she is okay and shout name.

**Check for signs of opioid overdose:**

- Will not wake up or respond to your voice or touch
- Breathing is very slow, irregular, or has stopped
- Center part of their eye is very small, sometimes called "pinpoint pupils"

**Lay the person on their back to receive a dose of NARCAN® Nasal Spray.**

**2 Give NARCAN® Nasal Spray**

**Remove** NARCAN® Nasal Spray from the box.

**Peel** back the tab with the circle to open the NARCAN® Nasal Spray

**Hold** the NARCAN® Nasal Spray with your thumb on the bottom of the plunger and your first and middle fingers on either side of the nozzle.

**3 Call for emergency medical help, Evaluate, and Support**

**Gently insert the tip of the nozzle into either nostril.**

- Tilt the person's head back and provide support under the neck with your hand. Gently insert the tip of the nozzle into one nostril, until your fingers on either side of the nozzle are against the bottom of the person's nose.

**Press the plunger firmly** to give the dose of NARCAN® Nasal Spray.

- Remove the NARCAN Nasal Spray from the nostril after giving the dose.

**Get emergency medical help right away.**

Move the person on their side (recovery position) after giving NARCAN Nasal Spray.

**Watch the person closely.**

If the person does not respond by waking up, to voice or touch, or breathing normally another dose may be given. NARCAN Nasal Spray may be dosed every 2 to 3 minutes, if available.

**Repeat Step 2 using a new NARCAN Nasal Spray to give another dose in the other nostril.** If additional NARCAN Nasal Sprays are available, repeat step 2 every 2 to 3 minutes until the person responds or emergency medical help is received.

12

## Naloxone Details

Safety Information on Naloxone Spray



Cannot be abused	No adverse effect if naloxone is given to someone not overdosing opioids.	Not a substitute for emergency medical
Give a second dose after 2–3 minutes, if no response	Someone can overdose again after therapy	Naloxone can provoke withdrawal symptoms (e.g. agitation, nausea, vomiting, diarrhea, nausea, tachycardia)
Get medical help right away after first dose: Rescue breathing or CPR may be given while waiting for 911 help	Does not reverse or work on other overdoses such as : •Sedatives: Valium, Ativan, Xanax, alcohol •Stimulants: cocaine, Amphetamines	

13

## Who can Administer Naloxone?

### Good Samaritan Overdose Law



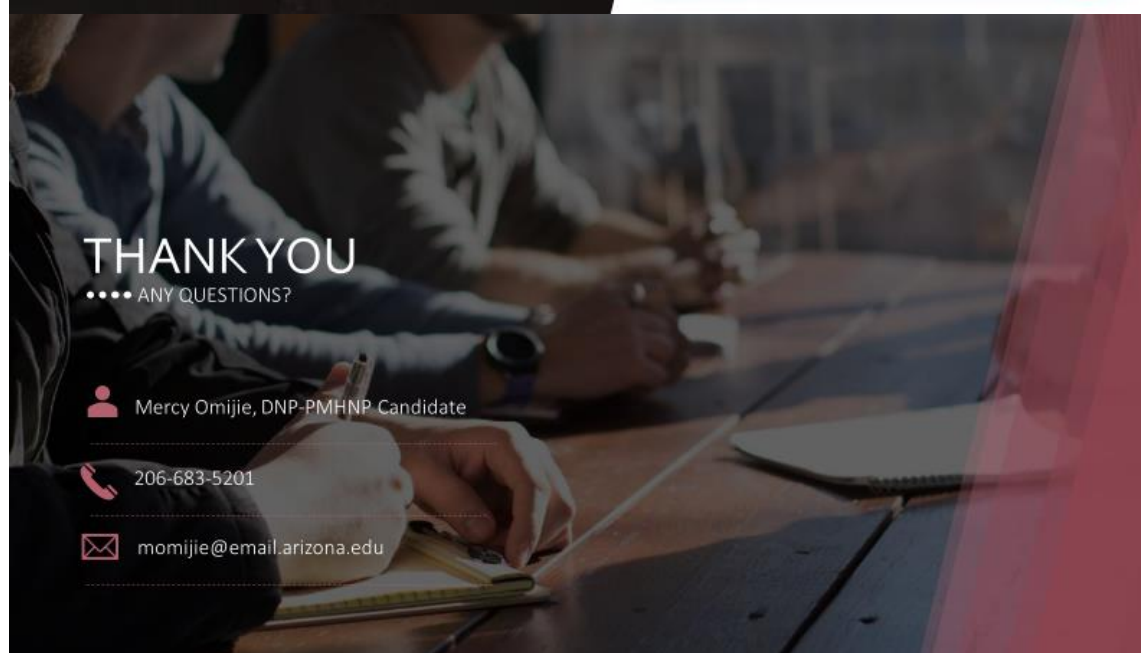
“Under the Arizona Revised Statutes (A.R.S. § 36-2267), any person may administer naloxone to a person who is experiencing an opioid-related overdose in good faith without compensation is not liable for any civil or other damages as the result of the act.”




Brief Video  
Naloxone: How is it given?


<https://www.youtube.com/watch?v=aR3qA63TrAI>


15



THANK YOU  
•••• ANY QUESTIONS?

 Mercy Omijie, DNP-PMHNP Candidate

 206-683-5201

 [momijie@email.arizona.edu](mailto:momijie@email.arizona.edu)

## References



- ADAPT Pharma (2019). Narcan nasal spray 4mg. Retrieved from <https://www.narcan.com/community/education-awareness-and-training-resources>
- Arizona Department of Health Services. (n.d.) Use of naloxone by law enforcement for opioid overdose. Retrieved from <https://azdhs.gov/documents/preparedness/emergency-medical-services-trauma-system/training/naloxone.pdf>
- Arizona Department of Health Services (2017). Naloxone. Retrieved from <file:///C:/Users/mercy/Downloads/opioid-naloxone-faq.pdf>
- Canadian Pharmacists Association (CPA) (2017). Administering naloxone spray [e-video]. Retrieved from <https://www.youtube.com/watch?v=aR3qA63TrAI>
- The Pulse Arizona. (2018). Transforming public health crisis into community opportunities. Retrieved from <https://www.azpulse.org/transforming-public-health-crises-into-community-opportunities/>
- Sonoran Prevention Works (2016). Dispensing naloxone to prevent overdose deaths. Retrieved from <https://pharmacymp.az.gov/sites/default/files/documents/files/Pharmacist%20Naloxone%20Dispensing%20Guide.pdf>

**Abstract**

**Purpose:** To provide education and training on administering Naloxone nasal spray (NNS) & increase staff/provider's knowledge, comfort, attitude, and readiness to use NNS in reversing opioid overdose.

**Background:** Opioid overdose (OOD): (1) significant health crisis impacting public's health, (2) decreased quality of life, (3) impacts US communities' social and economic welfare.

**Method:** QI project. Quantitative. Comparison of pre- and post-surveys to evaluate the impact of the educational intervention.

**Result:** Increase in participants' knowledge (+7% gain) & comfort, attitude, and readiness to intervene in opioid overdose treatment (+0.89 mean avg gain).

**Conclusion:** Educational intervention increased participant knowledge, comfort, attitude, and readiness to intervene in the treatment of OOD using NNS.

**Purpose**

Project Question

In an outpatient clinic, will educating the staff on NNS an emergency medication, increase their baseline knowledge, comfort, attitude, and readiness level to use NNS in treatment of OOD

Project Objectives

- 1) Provide bystanders (clinical providers/nonclinical staff) evidence-based education & training on OOD and use of NNS treatment in an OOD situation.
- 2) To evaluate the staff's understanding of the educational content immediately before & after they receive the training.
- 3) Provide summary & recommendations for practice improvement to the clinic.

**Background/Significance**

The Opioid Overdose Epidemic in America

Between 2018 -2019....

  
Leading cause of unintentional injury death in America

  
128 people die every day in the America.

  
168 million written opiate prescription

  
35 to 43 million people misused opioid prescriptions

  
80% transitioned to Heroin

  
78.5 billion economic burden

**Methods**

**Design**

- QI project. Quantitative pre & post survey design.

**Intervention**

- Qualtrics electronic platform to deliver self administered surveys.
- 20 minutes, online, asynchronous learning, PowerPoint presentation.

**Sample/Recruitment/Consent**

- Recruited by email.
- Consent waiver obtained via Qualtrics.
- N=7 Bayless Integrated Healthcare Center (BIHC) employees; clinical providers & nonclinical staff .
- Phoenix Arizona, South Mountain Region.

**Instruments**

- 10 - items Modified version of the Opioid Overdose Knowledge scale (OOKS) & 10 – item modified Opioid Overdose Attitude Scale (OOAS) (Williams et al., 2013).

**Data Collection**

- Pre and post OOKS & OOAS.
- Demographics, Multiple choice, True or false, Likert scale.

**Data Analysis**

- Cumulated group percentage and mean average score.



**Results/Discussion**

Interpretation of OOKS Knowledge

	Pretest	Posttest	Change
Correct Answers	77%	84%	Gained +7%
Overall summary of the group's OOKS score			

Interpretation of OOAS Attitude

Likert Scale Options: (5) Strongly agree (4) Somewhat agree (3) Neither agree nor disagree (2) Somewhat disagree (1) Strongly disagree	Pretest Mean	Posttest Mean	Change
Summary of 10 items questions	3.24	4.13	+ 0.89

**Conclusion**

The QI findings illuminated education importance as an effective intervention proven to increase baseline knowledge, comfort, attitude, & readiness as an intervention in the treatment of OOD using NNS.

Theoretical Framework

- Health Belief Model promotes education & takes positive actions to avoid negative issues.

Implication

1) Expanded knowledge, (2) Contributed to the Harm Reduction Effort, (3) NNS treatment policy, (4) Explore education intervention in other communities' clinic.

Limitation

- Covid-19 restrictions impacted education intervention (in-person session, hands on).

Sustainability

- Educational intervention will be implemented at BIHC clinic & the other locations in Phoenix area.

Dissemination

- Results shared with clinic, will be submitted for publication & maybe presented at conferences in hopes to reach a wider group of healthcare providers and nonclinical staff members in similar clinical setting.

**Author's Contact Information**

(206) 6835201  
Email: momijie@email.arizona.edu

**References**

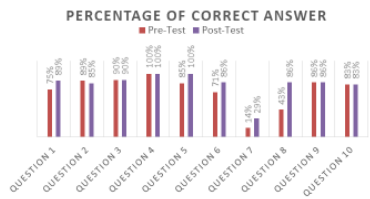


**Results/Discussion**

Demographic

	N=7
Age	20 – 30 (29%), 31 – 40 (57%), 41 – 50 (14%)
Gender	6 females (86%), 1 male (14%)
Role	Physician (29%), Therapies (43%), Medical Assistant (14%), Other (14%)
Years of psychiatric experience	< 5 yrs. (71%), >5yrs. (29%)
Previous experience with substance use disorder	Yes (86%), No (14%)
Previous experience with opioid overdose	Yes (29%), No (71%)
Previous training and education on intranasal Naloxone	Yes (43%), No (57%)

OOKS Survey Reflecting Knowledge Change



APPENDIX F:  
PROJECT TIMELINE

Completion Date	Planning	Pre-Implementation	Implementation	Evaluation
1/30/2020	Met with key stakeholder to obtain their support and receive feedback			
2/5/2020	First planning meeting with stakeholder to review proposed education intervention			
2/13/2020	Generated materials list needed to implement the project			
2/20/2020	Created draft for educational content for intervention			
3/2/2020	Created draft for pre and post surveys			
3/15/2020	Made further revisions to the pre and post surveys and applied to Qualtrics.			
4/8/2020		Finalized educational content and created PowerPoint presentations		
5/13/2020	Requested permission from Kings College London Addictions to utilize OOAS and OOKS surveys			
5/18/2020		Obtained permission from Kings College London Addictions to utilize OOAS and OOKS surveys		
06/20/2020		Obtained permission from clinical site to implement QI project		
07/13/2020		Submitted IRB application		

Completion Date	Planning	Pre-Implementation	Implementation	Evaluation
<b>07/24/2020</b>		Obtained permission from IRB to implement the project		
<b>08/28/2020</b>	E-mailed flyers including training schedule to all participants			
<b>08/28/2020</b>			E-mailed e-web based lecture to participants	
<b>08/28/2020</b>				Qualtrics Pretest and posttest of educational sessions
<b>10/13/2020</b>				Collected all participants results for data analysis, create graphs.
<b>10/04/2020</b>				Analyzed results, then composed a clear data analysis
<b>10/10/2020</b>				Generated conclusion from data analysis interpretation
<b>10/27/2020</b>				Reports QI results to stakeholders and provide executive summary and recommendation on the findings.

APPENDIX G:  
LITERATURE REVIEW GRID

Project Question: In an outpatient clinic (P), will educating the staff on the use of naloxone nasal spray, an emergency medication (I), increase their baseline knowledge, comfort, attitude, and readiness level to use NNS in treatment of OOD (O); comprehension of the educational session by participants will be measured immediately before and after the clinical providers and staff receive an educational training (T).

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
Ashrafioun, L., Gamble, S., Herrmann, M., Baciewicz, G. (2016)	Evaluation of knowledge and confidence following opioid overdose prevention training: A comparison of types of training participants and naloxone administration methods	Cross-Sectional Comparative Study	<p><u>Hypothesis</u> Is opioid overdose training effective in increasing knowledge and confidence related to opioid overdose situations?</p> <p><u>Findings</u></p> <ul style="list-style-type: none"> <li>• Participants' overall knowledge and confidence increased significantly from pre- to post-training (<math>P &lt; .001</math>).</li> <li>• Confidence was higher among those who were trained to use the intranasal Naloxone (<math>p = .011</math>).</li> <li>• Post-hoc tests revealed improved confidence among providers and friends/family than the first responder.</li> </ul>	The study conducted by Ashrafioun et al. (2016) supports the PICOT question, revealing that educational intervention can significantly increase knowledge and confidence towards administering intranasal Naloxone in the OOD situation.
Avetian, G. K., Fiuty, P., Mazzella, S., Koppa, D., Heye, V., & Hebbar, P. (2018)	Use of naloxone nasal spray 4 mg in the community setting: a survey of use by community organizations	Retrospective Study	<p><u>Hypothesis</u> To survey the first responders and community-based organization experience with Naloxone Nasal Spray</p>	The study conducted by Avetian et al. (2018) is linked to the PICOT question regarding educating clinical and nonclinical staff on the effectiveness of NNS

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
			<p>(NNS)formulation for opioid overdose reversal.</p> <p><u>Findings</u></p> <ul style="list-style-type: none"> <li>• NNS was successful at reversing OOD in 98% (242/245) of the cases.</li> <li>• About 73% (125/170) of the OOD reversal cases response time was an average of ≤ 5 minutes following NNS administration.</li> <li>• Nearly 95% (165/173) were heroin cases and 5.2% (9/173) fentanyl cases.</li> <li>• About 3 deaths occurred due to delays in the NNS administration.</li> <li>• Reported NNS side effects include opioid withdrawal symptoms.</li> </ul>	<p>formulation and OOD management at the outpatient clinic setting.</p>
<p>Giglio, R. E., Li, G., &amp; DiMaggio, C. J. (2015)</p>	<p>Effectiveness of bystander naloxone administration and overdose education programs: a meta-analysis</p>	<p>Meta-Analysis</p>	<p><u>Hypothesis</u> Is bystander naloxone administration and overdose education programs associated with increased odds of recovery and with improved knowledge of overdose recognition and management in non-clinical settings?</p> <p><u>Findings:</u></p>	<p>The study conducted by Giglio et al. (2015) supports the PICOT question by revealing that educational intervention can increase knowledge towards OOD management in non-clinical settings. The findings also showed that the delivery of Naloxone significantly increased the number of</p>

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
			<ul style="list-style-type: none"> <li>• Data from 5 studies indicate a significant increase in knowledge among trained participants group for tests on OOD management (SD = 1.35, 95% CI = 0.92 to 1.77).</li> <li>• Pooled data from 4 studies showed that Naloxone significantly increased the odds of overdose recovery compare to no treatment (OR = 8.58, 95% CI = 3.90 to 13.25).</li> </ul>	survival rates versus no treatment.
Klimas, J., Egan, M., Tobin, H., Coleman, N., & Bury, G. (2015)	Development and process evaluation of an educational intervention for overdose prevention and naloxone distribution by general practice trainees	Pilot Study	<p><u>Hypothesis</u> Can appropriate educational training help general practitioners (GP) provide Naloxone themselves or instruct patients how to use it?</p> <p><u>Findings</u></p> <ul style="list-style-type: none"> <li>• Significantly increased in knowledge regarding risks of overdose and appropriate actions to be taken post-training [MD 3.52; SD 4.45, P &lt; 0.001).</li> <li>• Improved attitudes towards OOD</li> </ul>	The study conducted by Klimas et al. (2015) supports the PICOT question by revealing that educational intervention increased the GP knowledge regarding risks of OD and attitude towards OOD management.

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
			<p>management [MD 11.13; SD 6.38, P &lt; 0.001).</p> <ul style="list-style-type: none"> <li>The most and least useful delivery methods were simulation and video, respectively.</li> </ul>	
<p>Mahonski, S. G., Leonard, J. B., Gatz, J. D., Seung, H., Haas, E. E., &amp; Kim, H. K. (2020)</p>	<p>Prepacked naloxone administration for suspected opioid overdose in the era of illicitly manufactured fentanyl: a retrospective study of regional poison center data</p>	<p>Retrospective Study</p>	<p><u>Hypothesis</u> Do the presence of manufactured fentanyl, and its analog in heroin supply affects the prepacked naloxone kits (PNK) doses administered?</p> <p><u>Findings</u></p> <ul style="list-style-type: none"> <li>Primary outcome: PNK reverses opioid intoxication.</li> <li>Secondary outcome: Opioid toxicity was reversed in about 79.2% (n=958) cases after administering a mean dose of 3.12mg.</li> <li>Of the 291 subjects who received an additional mean PNK dose of 2.2mg, about 94.2% of opioid toxicity cases were reversed.</li> <li>Decrease reversal rate from 82.1% to 76.4% after PNK mean dose</li> </ul>	<p>This study conducted by Mahonski et al., 2020 linked to the PICOT question regarding educating clinical and non-clinical staff on the effectiveness of PNK formula and OOD management.</p>

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
			was increased from 2.12 to 3.63mg PNK (P<.0001).	
Ray, B., O'Donnell, D., & Kahre, K. (2015)	Police officer attitudes towards intranasal naloxone training	Exploratory Study	<p><u>Hypothesis</u> To investigate police officers' attitudes about their intranasal training.</p> <p><u>Findings</u></p> <ul style="list-style-type: none"> <li>• Increased positive feelings about the training.</li> <li>• About 89.7% of the officer's report that naloxone training was simple and that intranasal Naloxone is easy to use in an OOD situation [low mean of 7.24; SD = 2.83].</li> <li>• Increased knowledge towards taking appropriate actions.</li> </ul> <p>More positive attitude among officers who have had prior experience.</p>	The Ray et al. (2015) study is relevant to the PICOT because it showed naloxone training impact on attitudes and comfort level towards OOD management.

## REFERENCES

- American Psychiatric Association (APA). (2013). *Opioid use disorder diagnostic criteria*. <https://www.aoaam.org/resources/Documents/Clinical%20Tools/DSM-V%20Criteria%20for%20opioid%20use%20disorder%20.pdf>
- American Association of College of Nursing. (2006). *The essentials of doctoral education for advanced nursing practice*. <https://www.aacnnursing.org/DNP/DNP-Essentials>
- Arizona Department of Health Services (AZDHS). (2017). *Naloxone*. <https://azdhs.gov/documents/prevention/womens-childrens-health/injury-prevention/opioid-prevention/opioid-naloxone-faq.pdf>
- Arizona Department of Health Services (AZDHS). 2020. *Opioid epidemic*. <https://www.azdhs.gov/prevention/womens-childrens-health/injury-prevention/opioid-prevention/index.php>
- Arizona Department of Health Services (AZDHS). (2018). *South Mountain Village & Guadalupe primary care area (PCA)*. <https://azdhs.gov/documents/prevention/health-systems-development/data-reports-maps/primary-care/maricopa/41.pdf>
- Arizona Department of Health Services (AZDHS). (2019a). *Opioid epidemic*. <https://www.azdhs.gov/prevention/womens-childrens-health/injury-prevention/opioid-prevention/index.php>
- Arizona Department of Health Services (AZDHS). (2019b). *2016 Arizona opioid report*. <https://www.azdhs.gov/documents/audiences/clinicians/clinical-guidelines-recommendations/prescribing-guidelines/arizona-opioid-report.pdf>
- Arizona Department of Transportation (AZDOT). (2018). *2018 Motor vehicle crash facts for the State of Arizona*. <https://azdot.gov/sites/default/files/news/2018-Crash-Facts.pdf>
- Arizona Opioid Epidemic Act. (2018). *Arizona opioid epidemic act – Governor Doug Ducey*. [https://azgovernor.gov/sites/default/files/opioidepidemicactweb\\_0.pdf](https://azgovernor.gov/sites/default/files/opioidepidemicactweb_0.pdf)
- Arizona Practice Transformation Network (APTN). (n.d.). *Bayless Integrated Healthcare exemplary practice performance summary*. <https://piiiaz.org/wp-content/uploads/2019/09/Pii-Symposium-Booklet.pdf>
- Arizona State Board of Pharmacy (AZSBP). (2016). *Pharmacist: dispensing opioid antagonist without prescription*. <https://pharmacy.az.gov/pharmacists-dispensing-opioid-antagonists-prescription>

- Avetian, G., Fiuty, P., Mazzella, S., Koppa, D., Heye, V., & Hebbar, P. (2018). Use of naloxone nasal spray 4 mg in the community setting: A survey of use by community organizations. *Current Medical Research and Opinion*, *34*(4), 573-576.
- Ashrafioun, L., Gamble, S., Herrmann, M., & Baciewicz, G. (2016). Evaluation of knowledge and confidence following opioid overdose prevention training: A comparison of types of training participants and naloxone administration methods. *Substance Abuse*, *37*(1), 76-81. doi:10.1080/08897077.2015.1110550
- Baldwin, G., Noonan, R., Haegerich, T., Dowell, D., & Houry, D. (2018). PW 0673 The changing opioid overdose epidemic in the United States – CDC response. *Injury Prevention*, *24*(Suppl 2), A258-A259.
- Bayless Integrated Healthcare. (2020). *About*. Retrieved from <https://www.baylesshealthcare.com/about/>
- Behar, E., Santos, G., Wheeler, E., Rowe, C., & Coffin, P. (2015). Brief overdose education is sufficient for naloxone distribution to opioid users. *Drug and Alcohol Dependence*, *148*, 209-212.
- Bessen, S., Metcalf, S., Saunders, E., Moore, S., Meier, A., Mcleman, B., ... Marsch, L. (2019). Barriers to naloxone use and acceptance among opioid users, first responders, and emergency department providers in New Hampshire, USA. *International Journal of Drug Policy*, *74*, 144-151
- Binswanger, I., Koester, A., Mueller, S., Gardner, S., Goddard, R., & Glanz, E. (2015). Overdose education and naloxone for patients prescribed opioids in primary care: A qualitative study of primary care staff. *Journal of General Internal Medicine*, *30*(12), 1837-1844.
- Bipartisan Policy Center. (2019). *Tracking federal funding to combat the opioid crisis*. <https://bipartisanpolicy.org/wp-content/uploads/2019/03/Tracking-Federal-Funding-to-Combat-the-Opioid-Crisis.pdf>
- Centers for Disease Control and Prevention. (n.d.). *Assessing and addressing opioid use disorder*. <https://www.cdc.gov/drugoverdose/training/oud/accessible/index.html>
- Centers for Disease Control and Prevention. (2012). *Community-based overdose prevention program providing naloxone – United States 2010*. <https://www.cdc.gov/mmwr/pdf/wk/mm6106.pdf>
- Centers for Disease Control and Prevention. (2018a). *Understanding the epidemic*. <https://www.cdc.gov/drugoverdose/epidemic/index.html>.
- Centers for Disease Control and Prevention. (2018b). *Promoting patient care and safety*. [https://www.cdc.gov/drugoverdose/pdf/guidelines\\_at-a-glance-a.pdf](https://www.cdc.gov/drugoverdose/pdf/guidelines_at-a-glance-a.pdf)

- Centers for Disease Control and Prevention. (2019). *Medication-assisted treatment for opioid use disorder*. <https://www.cdc.gov/niosh/docs/wp-solutions/2019-133/pdfs/2019-133.pdf>
- Centers for Disease Control and Prevention (CDC). (2020). *US opioid prescribing rate maps*. <https://www.cdc.gov/drugoverdose/maps/rxrate-maps.htm>
- Cicero, T. J. & Ellis, M. S. (2017). The prescription opioid epidemic: A review of qualitative studies on the progression from initial use to abuse. *Dialogues in Clinical Neuroscience*, 19(3), 259-269.
- Coughlan, M., Cronin, P., & Ryan, F. (2007). Step-by-step guide to critiquing research. Part 1: quantitative research. *British Journal of Nursing*, 16(11), 658-663.
- Curtis, K., Fry, M., Shaban, R. Z., & Considine, J. (2017). Translating research findings to clinical nursing practice. *Journal of Clinical Nursing*, 26(5-6), 862-872. doi:10.1111/jocn.13586
- Department of Health Education and Welfare (DHEW). (2018). *The Belmont report: Ethical principles and guidelines for the protection of human subjects of research*. Retrieved from <https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/read-the-belmont-report/index.html>
- Dierckx de Casterlé, B., Gastmans, C., Bryon, E., & Denier, Y. (2012). QUAGOL: A guide for qualitative data analysis. *International Journal of Nursing Studies*, 49(3), 360-371.
- Drainoni, M. L., Koppelman, E. A., Feldman, J. A., Walley, A. Y., Mitchell, P. M., ... Ellison, J. (2016). Why is it so hard to implement change? A qualitative examination of barriers and facilitators to distribution of naloxone for overdose prevention in a safety net environment. *BMC Research Notes*, 9, 465
- Gabay M. (2016). Increasing access to naloxone and legal issues. *Hospital Pharmacy*, 51(8), 633-634. <https://doi.org/10.1310/hpj5108-633>.
- Gannon F. (2001). The essential role of peer review. *EMBO Reports*, 2(9), 743. <https://doi.org/10.1093/embo-reports/kve188>
- Goldberg, S. A., Liao, V. T., Albert, J., ... Eyre, A. J., DiClemente, J., Weiner, S. G. (2017). 39 feasibility of bystander administration of public access naloxone for opioid overdose. *Annals of Emergency Medicine*, 70(4), S16. <https://doi.org/10.1016/j.annemergmed.2017.07.063>
- Giglio, R., Li, E., & DiMaggio, G. (2015). Effectiveness of bystander naloxone administration and overdose education programs: a meta-analysis. *Injury Epidemiology*, 2(1), 1-9.

- Green, T. C. & Doe-Simkins, M. (2016). Opioid overdose and naloxone: The antidote to an epidemic? (2016). *Drug and Alcohol Dependence*, 163, 265-271.
- Harm Reduction Coalition. (2012). *Guide to developing and managing overdose prevention and take-home naloxone projects*. Retrieved from <https://harmreduction.org/wp-content/uploads/2012/11/od-manual-final-links.pdf>
- Hawk, K., Vaca, F., & D'Onofrio, G. (2015). Reducing fatal opioid overdose: Prevention, treatment and harm reduction strategies. *Yale Journal of Biology and Medicine*, 88(3), 235-245.
- Haug, N. A., Bielenberg, J., Linder, S. H., & Lembke, A. (2016). Assessment of provider attitudes toward #naloxone on twitter. *Substance Abuse*, 37, 35-41
- Institute for Healthcare Improvement (IHI) (2020). *How to improve*. <http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>
- Institute for Healthcare Improvement (IHI) (2020). *Science of improvement: Forming the team*. <http://www.ihl.org/resources/Pages/HowtoImprove/ScienceofImprovementFormingtheTeam.aspx>
- Janz, N. & Becker, M. (1984). The health belief model: A decade later. *Health Education Quarterly*, 11(1), 1-47.
- Kolodny, A., Courtwright, D. T., Hwang, C. S., Kreiner, P., Eadie, J. L., Clark, T. W., & Alexander, G. C. (2015). The prescription opioid and heroin crisis: A public health approach to an epidemic of addiction. *Annual Review of Public Health*, 36(1), 559-574. <https://www-annualreviews-org.ezproxy2.library.arizona.edu/doi/10.1146/annurev-publhealth-031914-122957>
- Klimas, J., Egan, M., Tobin, H., Coleman, N., & Bury, G. (2015). Development and process evaluation of an educational intervention for overdose prevention and naloxone distribution by general practice trainees. *BMC Medical Education*, 15.
- Krieter, P. A., Chiang, C. N., Gyaw, S. J., & McCann, D. (2019). Comparison of the pharmacokinetic properties of naloxone following the use of FDA-approved intranasal and intramuscular devices versus a common improvised nasal naloxone device. *The Journal of Clinical Pharmacology*, 59(8), 1078-1084.
- Lambdin, B., Davis, C., Wheeler, E., Tueller, S., & Kral, A. (2018). Naloxone laws facilitate the establishment of overdose education and naloxone distribution programs in the United States. *Drug and Alcohol Dependence*, 188, 370-376.

- Mahonski, S., Leonard, J., Gatz, J., Seung, H., Haas, E., & Kim, H. (2020). Prepacked naloxone administration for suspected opioid overdose in the era of illicitly manufactured fentanyl: A retrospective study of regional poison center data. *Clinical Toxicology* (Philadelphia, PA), 1-7.
- Mao, R. D. & Ong, M. E. (2016). Public access defibrillation: Improving accessibility and outcomes. *British Medical Bulletin*, 118(1), 25-32. <https://doi.org/10.1093/bmb/ldw011>
- McDonald, R., Lorch, U., Woodward, J., Bosse, B., Dooner, H., Mundin, G., ... Strang, J. (2018). Pharmacokinetics of concentrated naloxone nasal spray for opioid overdose reversal: Phase I healthy volunteer study. *Addiction*, 113(3), 484-493.
- Nadelmann, E. & LaSalle, L. (2017). Two steps forward, one step back: Current harm reduction policy and politics in the United States. *Harm Reduction Journal*, 14(1), 1-7. <https://doi.org/10.1186/s12954-017-0157-y>
- National Institute on Drug Abuse (NIDA). (2019a). *Opioid overdose crisis*. Retrieved from <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose-crisis>
- National Institute on Drug Abuse (NIDA) (2019b). *Opioid overdose crisis. Advancing Addiction Science*. <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose-crisis>
- National Institute on Drug Abuse (NIDA). (2019c). *Naloxone*. <https://www.drugabuse.gov/publications/drugfacts/naloxone>
- National Institute of Drug Abuse (NIDA) (2020). *Opioid overdose crisis*. <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose-crisis>
- Petrisor, B. & Bhandari, M. (2007). The hierarchy of evidence: Levels and grades of recommendation. *Indian Journal of Orthopaedics*, 41(1), 11-15. <https://doi.org/10.4103/0019-5413.30519>
- Polit, D. & Beck, C. (2017). *Nursing research: Generating and assessing evidence for nursing practice*, (10th ed.). Lippincott Williams & Wilkins.
- Pullen, E. & Oser, C. (2014). Barriers to substance abuse treatment in rural and urban communities: Counselor perspectives. *Substance Use & Misuse*, 49(7), 891-901. <https://doi.org/10.3109/10826084.2014.891615>
- Rogers, E. (2003). *Diffusion of innovations* (4th ed.), Free Press, New York
- Ray, B., O'Donnell, D., & Kahre, K. (2015). Police officer attitudes towards intranasal naloxone training. *Drug and Alcohol Dependence*, 146(1), 107-110.

- Phillips, J. K., Ford, M. A., & Bonnie, R. J. (2017). *Pain management and the opioid epidemic: Balancing societal and individual benefits and risk of prescription opioid use*. Retrieved from <https://www.ncbi.nlm.nih.gov/books/NBK458653/>
- Sackett, D. L. (1989) Rules of evidence and clinical recommendations on the use of antithrombotic agents. *Chest*, 95(2), S-4S.
- Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22, 63-75.
- Substance Abuse and Mental Health Services Administration. (SAMHSA). (2019). *Opioid overdose*. <https://www.samhsa.gov/medication-assisted-treatment/treatment/opioid-overdose>
- Schuchat, A., Houry, D., & Guy, G. P., Jr. (2017). New data on opioid use and prescribing in the United States. *JAMA*, 318(5), 425-426. doi:10.1001/jama.2017.8913
- Sullivan, G. M. & Artino, A. R., Jr (2013). Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, 5(4), 541-542. <https://doi.org/10.4300/JGME-5-4-18>
- The Lancet. (2019). Take-home naloxone: A life saver in opioid overdose. *The Lancet*, 393(10169), 296.
- Tarde, G. & Clark, T. E. (1969). *On communication and social influence selected papers (The heritage of sociology)*. Chicago, IL: The University of Chicago Press
- Thompson, A. (2014). The changing face of heroin use in the United States: A retrospective analysis of the past 50 Years. *JAMA: Journal of the American Medical Association*, 312(11), 1161.
- Thylstrup, B., Hesse, M., Jørgensen, M., & Thiesen, H. (2019). One opioid user saving another: The first study of an opioid overdose-reversal and naloxone distribution program addressing hard-to-reach drug scenes in Denmark. *Harm Reduction Journal*, 16(1), 1-9.
- United State Department of Health and Human Services. (2019). *What is the US opioid epidemic?* <https://www.hhs.gov/opioids/about-the-epidemic/index.html>
- United States Food & Drug Administration (FDA). (2018). *Narcan (naloxone nasal spray) approved to reverse opioid overdose*. <https://www.fda.gov/drugs/postmarket-drug-safety-information-patients-and-providers/narcan-naloxone-nasal-spray-approved-reverse-opioid-overdose>

United State Food & Drug Administration (FDA). (2019). *FDA approves first generic naloxone nasal spray to treat opioid overdose*. <https://www.fda.gov/news-events/press-announcements/fda-approves-first-generic-naloxone-nasal-spray-treat-opioid-overdose>

Volkow, N. D., Medina-Mora Icaza, M. E., Poznyak, V., Saxena, S., Gerra, G., The UNOCD-WHO Informal Scientific Network. (2019). Addressing the opioid crisis globally. *World Psychiatry, 18*(2), 231-232.

Wagner, K., Bovet, L., Haynes, B., Joshua, A., & Davidson, P. (2016). Training law enforcement to respond to opioid overdose with naloxone: impact on knowledge, attitudes, and interactions with community members. *Drug and Alcohol Dependence, 165*, 22-28.

Williams, A., Strang, J., & Marsden, J. (2013). Development of opioid overdose knowledge (OOKS) and attitudes (OOAS) scales for take-home naloxone training evaluation. *Drug and Alcohol Dependence, 132*(1-2), 383-386.