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Philadelphia College of Osteopathic Medicine
School of Professional and Applied Psychology
Department of Clinical Psychology

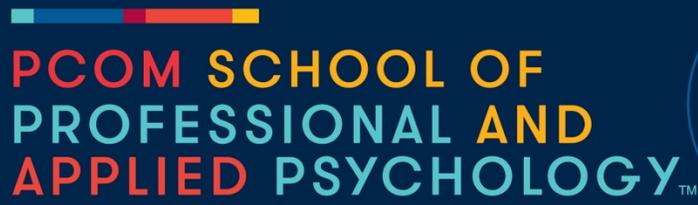
DO LAW ENFORCEMENT OFFICERS' ATTITUDES AND KNOWLEDGE IMPACT THEIR
LIKELIHOOD OF ADMINISTERING NALOXONE?

By Nicole Alexis Gulkis

Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Psychology

February 2022



DISSERTATION APPROVAL

This is to certify that the thesis presented to us by Nicole A. Gulkis on the 15th day of October, 2021, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

COMMITTEE MEMBERS' SIGNATURES

Chairperson

Chair, Department of Clinical Psychology

Dean, School of Professional & Applied Psychology

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ABSTRACT

Law enforcement officers (LEOs) are integral public service providers who have been called upon by government personnel across state and local government bodies to aid in combating the opioid epidemic. As LEOs are often the primary front-line workers who encounter opioid overdose scenarios, more states across the nation are training LEOs to administer naloxone. The emergence of Coronavirus (COVID-19) has complicated LEOs' involvement with naloxone administration because of shifts in policing strategies and occupational safety procedures. Given the current pandemic, concerns about contraction and transmission of COVID-19 must be considered for LEOs working in the frontlines of these concurrent public health crises. Evaluation of LEOs' attitudes and knowledge on administering naloxone is a developing area of research, as literature involving COVID-19 is limited. This present study included active LEOs from the Philadelphia Police Department ($N = 229$) who completed an online survey. A single linear regression model was used to evaluate the relationship between LEOs' degrees of belief in the disease model, degree of knowledge on opioid overdose and naloxone administration, degree of concern of contracting COVID-19, likelihood of administering naloxone; these items were based on a vignette of an opioid overdose encounter. LEOs' degree of knowledge and concern of contracting COVID-19 were both significantly and positively associated with likelihood of naloxone administration. Findings from this study can be used to refine current training curricula within the Philadelphia Police Department and to guide the development of naloxone training programs across police departments.

CHAPTER 1: INTRODUCTION

Statement of the Problem

An average of 130 Americans die every day from an opioid overdose, including prescription and illicit opioids (Centers for Disease Control and Prevention, 2018). From 1999-2017, nearly 400,000 people in the United States died from an overdose involving some class of opioid, prescription or illicit (Scholl et al., 2019). The opioid epidemic has consequently impacted life expectancy for individuals in the United States, specifically observed from 2015-2017 (National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division et al., 2017). Opioid overdose deaths are currently the single largest factor impeding rates of life expectancy (Dyer, 2018). The last time stagnation or decreases in life expectancy were consistently observed for 3 years in the United States was in 1915-1918 during World War I and the Spanish flu pandemic (Dyer, 2018).

The opioid epidemic has also been a significant economic burden estimated to cost the United States at least \$631 billion between 2015 through 2018 (Davenport et al., 2019). Costs associated with healthcare services for those with opioid use disorder (OUD), premature mortality, criminal justice services, child and family assistance programs, education programs, and lost productivity are all factors that comprise the estimated economic burden (Davenport et al., 2019). Mortality costs encompass loss of lifetime earnings for those who died prematurely as a result of drug overdoses involving opioids and was the most prominent factor that accounted for 40% of the estimated economic burden (Davenport et al., 2019). Opioid use not only affects the individual using opioids, but also extends to overall economic costs for taxpayers in the United States. Therefore, the opioid epidemic is not only a public-health concern, but also an

economic concern that could drastically and negatively strain the economy in future years.

The Centers for Disease Control and Prevention (2018) describes the occurrence of opioid overdose deaths in three specific waves. The first wave began in the 1990s as prescription opioids became widely prescribed by medical providers (Kolodny et al., 2015). Nearly 11 years lapsed between the first and second wave of opioid overdose deaths and entailed a drastic increase in deaths involving heroin (Centers for Disease Control and Prevention, 2018). In 2013, the third wave began and has primarily involved deaths related to synthetic opioids, such as fentanyl (Rudd et al., 2016; Scholl et al., 2019). In 2017, the U.S. Department of Health and Human Services declared a nationwide public-health emergency regarding the opioid crisis. The opioid epidemic is a momentous problem that warrants attention from political, health, and public service workers. One of the five priorities proposed in the strategy to address the opioid crisis is to target the availability and distribution of overdose-reversing drugs (U.S. Department of Health and Human Services, n.d.).

A commonly used opioid overdose reversal medication is naloxone hydrochloride, also identified by the brand names Narcan and Evzio (National Institute on Drug Abuse, 2020). This medication is approved by the U.S. Food and Drug Administration and reverses the effects of overdose by counteracting the depression of the central nervous and respiratory systems that can cause death (Faulkner-Gurstein, 2017). Naloxone is effective on all classes of opioids, including prescription pills, heroin, and fentanyl (Faulkner-Gurstein, 2017), a significant benefit given the substantial emergence of synthetic opioids, namely fentanyl and the 200 known synthetic derivatives

of fentanyl (Morgan & Jones, 2018). Naloxone may be administered via several different routes, including intravenous, intramuscular, subcutaneous injection, or intranasal (Morgan & Jones, 2018; Wermeling, 2015).

Depending on the route of administration, naloxone's effect may begin as quickly as 2 minutes but no longer than 10 minutes from the time of administration (Costantino et al., 2007; Wermeling, 2013). The rapid effect of naloxone is critical because opioid related overdoses result in respiratory depression and even death (Schiller & Mechanic, 2019). Additionally, nonfatal opioid-related overdoses can result in significant medical complications, such as opioid-induced respiratory depression, which is the most dangerous and primary complication associated with nonfatal overdoses (King et al., 2015). Owing to the short half-life of naloxone, withdrawal symptoms induced by naloxone administration typically dissipate within 30–60 minutes following administration (Dowling et al., 2008; Ngai et al., 1976). This medication is recognized as safe and effective, and has been widely used by organized healthcare systems, medical providers, and first responders (Wermeling, 2015).

In efforts to address the increasing incidence rates of opioid overdose deaths, state laws have focused on expanding naloxone availability for the general public (National Institute on Drug Abuse, 2018). Furthermore, law enforcement officers (LEOs) have recently been targeted as a group of public service providers who could assist in preventing opioid overdose deaths. LEOs need to participate in the movement to address the opioid crisis, as they are often first to arrive at the scene of an overdose and also are exposed to witnessing opioid overdoses at a greater frequency by patrolling the community (Dahlem et al., 2017).

As of March 2018, 2,340 law enforcement agencies in 42 of the 48 states reported to a national data repository that they administered a naloxone rescue program (Lurigio et al., 2018). Pennsylvania leads the nation with offering the most naloxone training programs, a total of 289 programs (Lurigio et al., 2018). Additionally, as of April 28, 2018, 737 police departments carried naloxone in Pennsylvania (North Carolina Harm Reduction Coalition, 2019). As more states are training LEOs to administer naloxone and providing them access to naloxone kits within their respective police districts, the evaluation of LEOs' attitudes and knowledge regarding administering naloxone has become an area of interest for researchers.

During the past 40 years, changes in both legal and social policies have been significant in regard to drug enforcement and public health (Green et al., 2013). Consequently, policing seems to have transitioned from an exclusive enforcement model as reflected by the War on Drugs campaign initiated by President Nixon to a more problem-solving framework when considering those affected by homelessness, mental illness, drug-market-driven violence, and substance abuse (Green et al., 2013; History.com Editors, 2017). Given that substance use has long been conceptualized and treated as a criminal and moral issue among members of the criminal justice system and society (Radcliffe & Stevens, 2008; Room, 2005), it is foreseeable that LEOs and other criminal justice personnel will argue against the notions of harm reduction or treatment for substance use disorders. Research findings reveal that the law enforcement community has a diverse range of attitudes and perceptions about individuals who use drugs and associated treatment modalities and policies (Beyer et al., 2002).

Addiction Models

Since ancient times, professionals from numerous fields of study have proposed theories in efforts to understand the etiology and maintenance of substance use disorders, along with substance use behaviors (Foddy & Savulescu, 2010). Following rigorous examination and evaluation of theories over the course of history, addiction models developed and became the means for the recognition and perception of addiction among society (Australian Government Department of Health, 2004). The moral model and disease model of addiction are the two predominant models of addiction that have been largely debated and studied (Henden et al., 2013; Morse, 2004; Uusitalo et al., 2013).

The culture of law enforcement historically aligns with the moral model of addiction, being that substance use is considered a choice and a moral weakness and should result in punishment (Pickard, 2017). Conversely, the disease model of addiction views substance use as a chronic neurobiological disease in which the substance user has no rational control or judgment over compulsive behaviors (Frank & Nagel, 2017). Rather than punishment, medical and clinical treatment interventions are considered most appropriate from a disease model perspective (Dunbar et al., 2010). Understanding LEOs' addiction attitudes from a specific model of addiction may inform their encounters with substance users in regard to interactions, enforcement, and treatment interventions.

The public's perception of law enforcement as being uninterested in overdose prevention may derive from those exclusive enforcement practices parallel to the moral model and related criminal sentencing policies directed toward drug markets (Kerr et al., 2005). Opposition by law enforcement agencies across the United States has been strong on administration of naloxone by LEOs, specifically related to ethical roles and

responsibilities (Lee et al., 2018). Logistical factors, such as lack of training on opioid overdose and naloxone administration or limited access to naloxone, may also contribute to the refusal or reticence of LEOs to administer naloxone (Lee et al., 2018). Lastly, occupational health and safety of LEOs has been acknowledged as an area of concern. LEOs have expressed apprehension about potential consequences of naloxone administration, primarily aggressive or combative behavior from the opioid overdose victim experiencing precipitated withdrawal symptoms (Heavey et al., 2018). Exposure to illicit drugs and paraphernalia during routine job duties and encounters with individuals under the influence of substances are additional concerns posed by LEOs (Goodison et al., 2019). The emergence of coronavirus (COVID-19) has complicated LEOs' duty to maintain order and safety and raised additional concerns about LEOs' personal health and safety (Gambacorta, 2020; Police Executive Research Forum, 2020).

COVID-19 Implications

The inception of COVID-19 has globally impacted the lives of countless individuals in a variety of ways, including health, financial stability, employment status, and workplace safety precautions (Buheji et al., 2020). The short-term and long-term consequences of COVID-19 are of concern, as this public health crisis has already demonstrated exceedingly high infection, transmission, and mortality rates worldwide (Ahorsu et al., 2020). As of September 29, 2021, a total of 43,348,554 cases of COVID-19 along with 695,092 deaths have been confirmed in the United States (Johns Hopkins University & Medicine, 2021). The onset, symptoms, and course of COVID-19 coupled with limited research on the nature of this infectious disease and treatment interventions have elicited significant worry in society at large (Holmes et al., 2020). Because LEOs'

occupational roles and responsibilities most commonly involve contact with the general public, LEOs are at significant risk of exposure to COVID-19 and associated health complications (Occupational Safety & Health Administration, 2020; Sim, 2020). From the time COVID-19 developed in the United States, the number of LEOs and law enforcement staff across various rankings who have contracted COVID-19 has increased (Bates, 2020). Consequently, police departments have been tasked to strategically assign a limited number of police staff to essential areas of need. Given the stark differences in the number of policing staff across cities, communities, and rural areas in the United States, the prioritization of safety and enforcement of laws while minimizing risk also vary (Bleiberg & Williams, 2020).

The opioid epidemic remains a prominent public health issue that requires support from essential medical and behavioral health workers. As LEOs have been enlisted as agents of change in combating the opioid epidemic, equipping LEOs with naloxone during the progression of COVID-19 has generated contention among police departments, harm reduction advocates, and the general public (Kuwabara-Blanchard, 2020a). Fear of contacting individuals who are potentially infected with COVID-19 has been indicated in recent research (Lin, 2020) and may also extend to LEOs who are working in the frontlines of both the opioid epidemic and the COVID-19 pandemic. Furthermore, fear of infectious disease has been suggested to induce powerful social processes, such as stigmatization and discrimination (Pappas et al., 2009), potentially evoking or exacerbating LEOs' preexisting attitudes toward substance users.

To date, existing research on LEOs' attitudes about overdose prevention and response is limited (Green et al., 2013), thereby reinforcing the need to understand LEOs'

perspectives from a widely studied model of addiction (e.g., the disease model).

Nonetheless, recognition of the influence of LEOs' attitudes and knowledge on the likelihood of naloxone administration is imperative being that LEOs are inheriting an interictal role in addressing the opioid epidemic.

Purpose of the Study

The research on LEOs' attitudes toward overdose prevention and response is limited, but during the past 6 years, interest regarding this topic has grown (Green et al., 2013). The main purpose of the current study was to examine how LEOs' attitudes and knowledge influence the likelihood of administration of naloxone to reverse opioid overdose). Degree of belief in the disease model was used to capture LEOs' attitudes. Hypothesized factors that may contribute to attitudes and knowledge of administering naloxone were also examined. These factors included age, gender, race, highest level of education, total years of employment as a LEO, current police district, number of witnessed opioid overdoses in individuals, and number of times administered naloxone.

As the opioid epidemic has produced numerous challenges in the United States, significant attention from numerous political and community organizations has shifted to the importance of enhancing LEOs' safety, health, and wellness (Goodison et al., 2019). The emergence of COVID-19 has globally raised health and safety concerns across the general public and consequently augmented occupational safety issues among all first responders. LEOs have vocalized their concerns as they relate to contraction and transmission of the infectious disease (Bleiberg & Williams, 2020), as a great majority work in the frontlines and interact with the general public on a regular basis. LEOs must receive necessary personal protective equipment (PPE) to protect themselves, colleagues,

and others from COVID-19 while fulfilling daily responsibilities and their roles as active agents against the opioid epidemic. Development of support groups or increased opportunities for LEOs to receive current information detailing the opioid crisis and COVID-19 could mitigate occupational burnout and feelings of helplessness by addressing the various health and safety concerns of LEOs (Cannizzo & Liu, 1995; Green et al., 2013).

As of April 28, 2018, 7,192 overdose reversals were administered by LEOs in Pennsylvania (North Carolina Harm Reduction Coalition, 2019). Philadelphia remains largely impacted by the opioid epidemic, as evidenced by having the highest overdose mortality rate (i.e., 65.9 per 100,000) among large U.S. cities in 2017 (City of Philadelphia Department of Public Health, 2018). The unexpected development of COVID-19 in the midst of the opioid epidemic reinforces the need for LEOs to receive appropriate training and have access to PPE and naloxone kits. A secondary purpose of the study is to understand how LEOs' fears of contracting COVID-19 may impact the administration of naloxone. Examination of LEOs' attitudes toward and knowledge of, as well as fears of, COVID-19 may inform the structure (i.e., face-to-face training or online), curriculum, and frequency of future naloxone training. If training targets negative attitudes and biases, along with educating LEOs, such factors may influence the behavior of LEOs administering naloxone and contribute to the public health movement of decreasing opioid overdose mortality rates while ensuring LEOs' safety in the presence of COVID-19.

Research Questions and Hypotheses

Research Questions

1. How do endorsement of the disease model of addiction, knowledge of opioid overdose, and use of naloxone impact LEOs' likelihood of administering naloxone to reverse opioid overdose?
2. Does concern of contracting coronavirus (COVID-19) impact the likelihood of administering naloxone?

Hypotheses

Hypothesis 1: LEOs' degrees of belief in the disease model as measured by the Addiction Belief Inventory (ABI) will be significantly and positively associated with naloxone administration.

Rationale: The disease model is based on the premise that addiction is a physiological disease with an onset and course and that it encompasses a specific set of symptoms, similarly to a chronic medical condition (Blume et al., 2013). LEOs who uphold beliefs grounded in the disease model may be more inclined to intervene via use of pharmaceutical interventions, such as naloxone, in order to reduce symptom severity of an opioid overdose. The disease model is a non-stigmatizing approach to substance use and users (Frank & Nagel, 2017) in comparison to other traditional models of addiction, such as the moral model. Researchers have proposed that addiction stigma impedes quality of care and use of treatment services (Grant et al., 2015; Grant et al., 2016; Volkow, 2008) and may negatively affect healthcare delivery (Van Boekel et al., 2013; Volkow, 2020), possibly also being the case for LEOs when encountered with an opioid overdose situation.

Hypothesis 2: LEOs' degrees of knowledge regarding opioid overdose and naloxone administration as measured by the Opioid Overdose Knowledge Scale (OOKS) will be significantly and positively associated with naloxone administration.

Rationale: Several studies revealed that in-person naloxone training can increase naloxone competency and mitigate degrees of concern regarding administration across various groups, including the general public (i.e., family members and friends of opioid users) and first responders (Ashrafioun et al., 2016; Purviance et al., 2017; Saucier et al., 2016; Wagner et al., 2016). Generally speaking, brief naloxone education and training have proved to enhance knowledge regarding overdose prevention (Behar et al., 2015). Furthermore, studies have demonstrated that training the general public on how to administer naloxone increases knowledge on how to respond to overdose situations, perceived confidence in responding, and willingness to perform recommended procedures (Bennett & Holloway, 2012; Green et al., 2008; Lewis et al., 2016; Maxwell et al., 2006; McAuley et al., 2010).

Hypothesis 3: LEOs' degrees of concern of contracting coronavirus (COVID-19) will be significantly and negatively associated with naloxone administration.

Rationale: Current literature suggests that first responders may react more strongly to COVID-19 and surrounding uncertainty as a result of their responsibility for maintaining public safety, risk of exposure through encounters with the general public, and concern of exposing family members to the virus (Stogner et al., 2020). Additionally, LEO stress has been inversely associated with job commitment, meaning that LEOs who experience greater job-related stress are less committed to their job role (Moon & Jonson, 2012). Police misconduct has also been associated with increases in organizational

stressors (Bishopp et al., 2016). Given the evolving regulations surrounding COVID-19, departmental policies, and fear of contracting COVID-19, LEOs' degree of stress may be heightened and consequently impact fulfillment of job roles, including administration of naloxone.

CHAPTER 2: REVIEW OF THE LITERATURE

The opioid epidemic is the most fatal illicit drug crisis in the history of the United States (Goodison et al., 2019). In 2017, there were 47,600 opioid-related overdose deaths, a 12% increase from 2016 (Scholl et al., 2019). Unfortunately, the opioid epidemic remains a significant issue today and does not appear to be subsiding. Based on the increased rates of opioid overdose deaths, public health experts estimate an additional 500,000 opioid overdose deaths during the next decade (Blau, 2017). Approximately 3 million people are diagnosed with opioid use disorder (OUD; Schuckit, 2016), likely a lower estimate than the actual number of individuals battling the condition. As substance use disorders are highly stigmatized by the general public (Yang et al., 2017), individuals might be ambivalent about seeking assistance because of anticipated stigma from healthcare providers, employers, neighbors, or law enforcement officers (LEOs; Jozaghi & Bird, 2018; Link & Phelan, 2001). Nearly 60%–70% of drug users experience an overdose during their lifetime (Sergeev et al., 2003; Warner-Smith et al., 2002), a significant issue as many individuals may not have sufficient support to engage in treatment or even survive a drug overdose.

Etiology of the Opioid Epidemic

The origin of the opioid crisis can be traced back nearly 4 decades. This phenomenon is complex in its etiology, as many components have been identified as responsible for the initiation and maintenance of the opioid epidemic. Medical personnel, pharmaceutical companies, and national healthcare organizations appear to be the most prominent and widely agreed upon on initiators of the opioid crisis (Dasgupta et al., 2018; Jones et al., 2018; Lyden & Binswanger, 2019; Wilkerson et al., 2016). Although

the narrative of the opioid epidemic has consistently identified medical and pharmaceutical disciplines as culprits, social and economic factors of the opioid epidemic are quite astonishing but receive less attention. The War on Drugs and the drug markets are two realms that deserve further examination regarding their past and current contribution to the opioid epidemic.

Medical and Pharmaceutical Perspectives

For most of the 20th century, physicians primarily prescribed opioid medications to individuals experiencing pain from cancer or receiving end-of-life care. On rare occasions, physicians prescribed opioid medications for acute pain, and prescriptions were time limited (Lyden & Binswanger, 2019). Physicians were conservative about prescribing opioids, as the medication was believed to be addictive, to place individuals at risk of overdose, and to not demonstrate effectiveness in treating chronic pain (Wilkerson et al., 2016). Cognitive behavioral therapy (CBT) and even hypnosis were the fundamental forms of treatment offered to individuals living with chronic pain (Dasgupta et al., 2018). Because CBT is time limited, health insurance companies provided a finite period of medical coverage to manage pain.

The argument of inadequate treatment of noncancer pain and underutilization of prescription opioids arose as pain specialists and patient advocacy groups pressed for equitable treatment (Lyden & Binswanger, 2019). As a result, medical providers were blamed for pain that their patients experienced beginning in the early 1980s (Goldman, 1993). The American Pain Society and other medical organizations began to significantly influence the development of pain management policies in favor of integrating prescription opioids as a form of treatment for chronic pain (Afilalo et al.,

1996; Ducharme, 1994). Eventually, physicians targeted pain management per healthcare policies and accreditation requirements from The Joint Commission on Accreditation of Healthcare Organizations while overlooking the addictive potential of prescription opioids (Wilkerson et al., 2016). Physicians' beliefs and concerns regarding the dangers and development of opioid misuse and addiction were essentially disproved following the publication of a letter to the editor in the *New England Journal of Medicine* in 1980 (Jones et al., 2018; Porter & Jick, 1980). Findings from a retrospective, observational study that reported fewer than 1% of 11,000 patients who received opioids in a hospital setting became addicted was frequently cited and promoted safety of prescription opioids for non-cancer pain (Jones et al., 2018; Lyden & Binswanger, 2019). The results of the 1980 study (Porter & Jick) were essentially misconstrued and frequently cited by pharmaceutical companies and media nationwide over the course of 4 decades (Jones et al., 2018). The increase in opioid prescriptions by physicians in conjunction with the influence of pharmaceutical companies are both significant factors in the etiology of the opioid epidemic.

While the rate and use of prescription opioids increased throughout the 1980s to 2010, so did their nonmedical use (Compton & Volkow, 2006; Hall et al., 2008). Nonmedical use of prescription opioids was on the rise as an estimated 25 million Americans engaged in the nonmedical use of prescription opioids from 2002 to 2011 (Center for Behavioral Health Statistics and Quality, 2012). The incidence rate of overdose deaths involving prescription opioids more than quadrupled from 1999 to 2019; nearly 247,000 people died from overdoses involving prescription opioids (Centers for Disease Control and Prevention, 2020c). These incidence rates are reflective of the

prescribing rate and use of prescription opioids from the 1980s to 2010 (National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division et al., 2017). Although the rates of opioid prescriptions consistently decreased from 2012 to 2018 (Centers for Disease Control and Prevention, 2019), heroin and fentanyl and its derivatives have exacerbated the rates of opioid overdose deaths (Centers for Disease Control and Prevention, 2020a; Centers for Disease Control and Prevention, 2020b). The potency of these full agonist opioids may in part explain why individuals who initially used prescribed opioids and transitioned to heroin have been associated with the increase in heroin overdose deaths (Dasgupta et al., 2014; Mars et al., 2014).

For the first time, in 2016, heroin, fentanyl, and other illicit opioids surpassed prescription opioids as the most common drugs involved in overdose deaths (Davenport et al., 2019). Even though nonmedical prescription opioid use has declined, illicitly produced synthetic opioids have exacerbated the degree of risk and adverse outcomes for individuals who use opioids (Green & Gilbert, 2016). Pain management treatment approaches and pharmaceutical and healthcare organizational procedures have certainly been identified as integral factors in the opioid epidemic; however, other aspects of the epidemic may better account for the increased patterns of opioid overdoses in the United States, including legal and social elements.

Legal and Social Perspectives

The declaration of the War on Drugs by President Nixon in June 1971 dramatically influenced both legal and social policies that continue to infiltrate the opioid epidemic today (Green et al., 2013; Percy, 2018). In efforts to reduce illicit drug use and trade in the United States, legal ramifications for drug-related charges were harsher, and

time of incarceration was elongated (Tuck & Stossel, 2019). Consequently, disproportionate incarceration rates for African Americans, Hispanics, and individuals of low socioeconomic status emerged while the relationship between substance use and imprisonment became reinforced (Beaver, 2009; Palamar et al., 2015). Institutional racism and punishments for specific drugs, such as crack cocaine, progressively influenced federal, state, and community strategies in reducing illegal drug trade in the United States, continuing the cycle of high imprisonment and recidivism rates for substance users (Tuck & Stossel, 2019).

The War on Drugs approach not only failed to attain its outlined objectives but also has contributed to an increase in drug overdoses and cultivation of powerful drug cartels that are still prominent today (Coyne & Hall, 2017). Proponents of illicit drug prohibition underestimated the stark consequences of banning substances, especially the propelling impact of the supply-and-demand curve on the drug black market. Sadly, overdoses and drug-related illness are the initial consequences of drug prohibition. This is owing to the lack of quality control mechanisms that are regulated for legal substances and absence of knowledge on drug purity or defectiveness within the black market (Coyne & Hall, 2017). Additionally, prohibition drives drug suppliers to develop and sell substances with greater potency because prohibition's added costs incentivize higher potency drugs and their higher value per unit (Coyne & Hall, 2017). Furthermore, drug dealers tend to sell more potent versions of all drugs because the opportunity to earn more money per unit is greater (Resignato, 2000). These factors promote both potent and contaminated drugs available in the black market and result in greater opportunities for drug-related overdoses once disbursed to drug users.

The advancement of cartels in the drug industry has been an ongoing challenge for political and law enforcement officials to regulate since the War on Drugs initiative began. Economists have indicated that the War on Drugs led directly to the expansion of violent Colombian drug cartels (Arrieta et al., 1991) and cartels from other countries, including Mexico, Asia, and Afghanistan (Coyne & Hall, 2017). In the early 2000s, Dominican gangs began to export Colombian heroin to the United States that was cheaper in cost while purer in quality compared to that of its predominant competitor, Asia (Percy, 2018). Unfortunately, Mexican drug cartels remain prominent and continue to produce and distribute heroin across the United States (Coyne & Hall, 2017; The DEA Philadelphia Division & The University of Pittsburgh School of Pharmacy, 2018). Heroin supplied by Mexican cartels presents a persistent and pervasive drug threat in Pennsylvania, as regional and local drug distributors are collaboratively supplying Pennsylvania and surrounding states (Percy, 2018; The DEA Philadelphia Division & The University of Pittsburgh School of Pharmacy, 2018). The increased presence of fentanyl and fentanyl-related substances combined in heroin likely reflects recent greater production and distribution of the substances by Mexican drug cartels during 2014-2017 (The DEA Philadelphia Division & The University of Pittsburgh School of Pharmacy, 2018).

In 1971, the Centers for Disease Control and Prevention announced that slightly more than 1 death per 100,000 people was related to drug overdose, a statistic that rose to 3.4 deaths per 100,000 people by 1990 and to 12 overdose deaths per 100,000 people by 2008 (Warner et al., 2011). Unfortunately, rates of overdose deaths have steadily increased, and in 2013, overdose deaths were primarily associated with the availability

and use of more potent synthetic opioids (Rudd et al., 2016). The notion of increased drug overdoses and powerful drug cartels as consequences of prohibition appear to be in sync with the failure of the War on Drugs and current contribution to the opioid epidemic. The strategies intended to reduce drug use and trade in the United States contribute to the opioid epidemic and should be considered as such, rather than solely targeting medical treatment approaches, healthcare organizations, and pharmaceutical companies.

Fentanyl

There is great concern in the United States about the accelerated number of deaths from synthetic opioids, such as fentanyl and heroin and their derivatives (Morgan & Jones, 2018). From 2010 to 2014, the incidence rate of heroin overdose fatalities more than tripled (Smyser & Lubin 2018). Furthermore, deaths from synthetic opioids doubled from 9,580 in 2015 to 19,413 in 2016 (Hedegaard et al., 2017). Consistent with the increased rate of opioid overdoses, life expectancy in the United States declined in both 2015 and 2016, as unintentional injuries, primarily drug overdoses, increased (Dowell, Arias, & Kochanek, 2017). Consumption of counterfeit prescription tablets resembling oxycodone or hydrocodone and use of synthetic opioids alone or combined with other illicit substances, such as heroin or cocaine, have been identified as influential factors in opioid overdose death rates (Dowell, Noonan, & Houry, 2017; Drug Enforcement Administration, 2016). While there are several classes of opioids, including natural opiates, semisynthetic opioids, and synthetic opioids (Opiate Addiction & Treatment Resource, 2013), the incidence rates of overdose deaths from synthetic opioids have become a more prominent issue among all opioid classes. Fentanyl has introduced a

greater degree of risk and harm being that it accounted for a mere 4% of opioid overdose deaths in 2011 and is now the leading substance involved in all drug overdoses in the United States (Hedegaard et al., 2018).

Cost of the Opioid Epidemic

The opioid epidemic has also been a significant economic burden and is estimated to have cost the United States at least \$631 billion between 2015 through 2018 (Davenport et al., 2019). Costs associated with healthcare services for those with OUD, (i.e., premature mortality, criminal justice services, child and family assistance programs, education programs, and lost productivity) are all factors that comprise the estimated economic burden (Davenport et al., 2019). In the United States, OUDs affect more than 2.1 million people, and the number of individuals living with OUD is fewer than the number that actually exists because of the stigma related to substance use disorders (Chang et al., 2018).

Healthcare Cost

Healthcare cost is one of the most significant domains contributing to the economic burden of the opioid epidemic. Individuals with OUD acquire additional healthcare costs as a result of receiving treatment. Specifically, individuals with OUD show increased use of physical health and behavioral health services at various levels of care compared to healthy individuals (Davenport et al., 2019). According to estimates from the Department of Health and Human Services, the number of individuals receiving medication-assisted treatment rose 38%, from approximately 921,000 to 1.27 million during the course of 2016-2019 (Council of Economic Advisers, 2019). Overall, the additional healthcare costs, including physical health, mental health, behavioral health,

and medications for individuals with OUD, ranged from approximately \$56.9 billion to \$72.3 billion in 2019 (Davenport et al., 2019).

Criminal Justice Cost

According to the Society of Actuaries, the criminal justice cost of nonmedical opioid use from 2015 to 2018 totaled \$39 billion, encompassing criminal activities, law enforcement encounters, legal proceedings, and incarcerations (Davenport et al., 2019). Comparably, property crime, including offenses of burglary, larceny-theft, motor vehicle theft, and arson, resulted in an estimated loss of \$16.4 billion in 2018. Although property crime poses a significant economic burden similar to that of nonmedical opioid use, a 10-year trend indicated that property crime offenses decreased 22.9% in 2018 when compared with the 2009 number of offenses (Federal Bureau of Investigation, 2019). Based on data from the Federal Bureau of Investigation Uniform Crime Reporting Program, a downward trend in the cost of property crimes appears to be consistent, which is not the case for opioid-related charges (Federal Bureau of Investigation, 2019).

The annual cost of criminal justice activities resulting from nonmedical opioid use increased nearly 2% each year between 2015 and 2018 and accounted for approximately 6% of the total cost (Davenport et al., 2019; Insurance Information Institute, Inc., 2020). Unfortunately, this upward trend is projected to continue because illicit opioid use remains a prominent issue in the United States. In 2017, the average daily incarceration rate for a federal inmate was \$99.45 per day, totaling \$36,299.25 annually (Hyle, 2018). Without preventive measures to reduce recidivism rates or provide treatment to individuals with substance use disorders, the criminal justice costs of nonmedical opioid use is likely to progressively rise. Broadly speaking, individuals involved in the criminal

justice system because of opioid-related charges include not only opioid users, but also those who manufacture or distribute illicit opioids, and more recently have included professionals and pharmaceutical companies who have contributed to the opioid epidemic (Christie et al., 2017). Taken together, healthcare, social, and criminal justice systems must thoughtfully identify and enact effective and efficient strategies to reduce the economic burden of the opioid epidemic.

Criminal Justice System Interventions

Opioid users are more likely to be involved at some level (i.e., federal, state, local) within the criminal justice system compared to nonopioid users (Winkelman et al., 2018). Estimates suggest that among individuals sentenced to jail and state prison, regular use of opioids was reported at 17% and 19%, respectively (Bronson et al., 2017). Furthermore, nearly half of drug courts serve groups in which more than 20% self-report opioid dependency (Nordstrom & Marlowe, 2016). Because the opioid use population has exponentially grown as a result of the opioid epidemic, its increased presence in the criminal justice system calls for innovative interventions and treatment approaches. State level criminal justice systems throughout the United States have been strongly urged to reduce the rates of incarceration for nonviolent drug offenders to subsequently decrease costs associated with incarceration (Chandler et al., 2009). In efforts to minimize punitive interventions, alternatives to incarceration have been gradually introduced within the criminal justice system and include, but are not limited to, medication-assisted treatment (MAT), law enforcement diversion programs, prosecutor diversion programs, adult drug courts, veterans treatment courts, residential treatment programs, and therapeutic communities (Chandler et al., 2009). These alternatives afford the criminal

justice system unique opportunities to reduce substance use among offenders while directly or indirectly reducing criminal behavior. Since the mid-1970s, research has suggested that drug treatment can facilitate positive change across myriad areas of a substance user's life (Chandler et al., 2009). Noteworthy benefits of treatment have included alteration of attitudes, beliefs, and behaviors toward drug use; abstinence from substance use; and avoidance of behaviors associated with substance use and criminal activity (Abram & Teplin, 1991; Chandler et al., 2004; Weinbaum et al., 2005). Furthermore, research findings and meta-analysis studies dated back to the 1990s have consistently reported the beneficial effects of treatment for substance users in the criminal justice system (Inciardi et al., 1997; Pearson & Lipton, 1999).

The criminal justice system's adherence to War on Drugs policies in 1971 (Pearl & Perez, 2018), together with the widely held moral model of addiction perspective of treatment, made the consideration of alternatives to incarceration challenging for policy makers. As the disease model of addiction endured significant scientific examination in the mid 1990s, the notion of addiction treatment also began to shift from punitive interventions to medical and biopsychosocial interventions (Kuhar, 1998). The development of drug courts in 1989 is a prime example of the shift in criminal justice strategies (Franco, 2010). Drug courts have shown to be effective in preventing and minimizing substance use, as studies have indicated that drug court participants demonstrate lower rates of substance use after program completion than comparison groups (Peters & Murrin, 2000; Turner et al., 2002). Furthermore, approximately half of drug court participants complete the full course of treatment, a substantial

accomplishment for those struggling with substance use disorders and having a history of criminal offenses (Mitchell et al., 2012; Turner et al., 2002).

Criminal Justice System and Substance Use Treatment

In regard to medical interventions, the criminal justice system has slowly begun to integrate pharmacotherapy approved by the Food and Drug Administration (i.e., MAT) into its treatment regimen for individuals diagnosed with OUD (Chandler et al., 2009; Friedmann et al., 2012; Matusow et al., 2013; Miller et al., 2016). Research findings have demonstrated that MAT reduces opioid use, criminal activity, arrests, and infectious disease transmission (Ball & Ross, 2012; Joseph et al., 2000; Mattick et al., 2009; Schwartz et al., 2009). Additionally, offenders who received MAT while incarcerated had lower overdose death rates post incarceration (Green et al., 2018; Marsden et al., 2017). Drug treatment courts along with jail reentry programs have pioneered the use of MAT in both settings, which continue to evolve throughout numerous criminal justice programs nationwide (Substance Abuse and Mental Health Services Administration, 2019). The efficacy of MAT is promising for the criminal justice system, as it promotes the use of evidenced-based treatments and could facilitate further discussions on development and implementation of other evidenced-based treatments across criminal justice systems. In June 2019, the National Institutes of Health announced the creation of a \$155 million, multiyear innovation network called Justice Community Opioid Innovation Network (National Institute on Drug Abuse, 2019a). This network is intended to support research on quality addiction treatment for OUD in criminal justice settings nationwide (National Institute on Drug Abuse, 2019a). As the criminal justice system

continues to reform its treatment approach across various levels, the benefits are likely to extend beyond the offender and improve public health and safety for all.

Etiology of Opioid Overdose Interventions

Globally, harm reduction can be characterized as a strategy or approach directed toward individuals or groups that aims to reduce the degree of harm associated with specific behaviors (Leslie et al., 2008). The primary domains involved in harm reduction involve a wide range of biopsychosocial consequences related to substance use, including HIV, hepatitis C, criminal activity, and death (Hawk et al., 2015; Marlatt, 1996). Rather than highlighting various measurements of drug consumption and endorsing punishment for individuals who are using substances, a harm reduction approach underscores the importance of improving health, social, and economic outcomes by focusing on the reduction in adverse effects of substance use (Leslie et al., 2008). From the 1950s to 1980, complete abstinence from drug use was a notion widely held and promoted in the United States; it then drastically shifted to a harm reduction approach starting in 1981 (Des Jarlais, 2017). Harm reduction principles and practices derived in the early 1980s in response to the discovery of acquired immunodeficiency syndrome (AIDS) and focused on reducing transmission of blood-borne infection (Des Jarlais, 2017). Substance users, particularly persons who injected drugs (PWID), were also affected by the harm reduction approach because the concern related to individuals sharing needles and contracting HIV was significant (Des Jarlais, 2017). In the mid to late 1980s, needle exchange practices originated as a practical public health intervention to the HIV and AIDS epidemics and were initially adopted by individuals who supported a harm reduction approach (Faulkner-Gurstein, 2017). Similarly, the use of naloxone to reverse

opioid overdose deaths emerged as another form of harm reduction in 1971 (McClellan et al., 2018). Consideration of naloxone as a harm reduction tool has evoked differing legal and public health perspectives either in support of or against such practices in the United States (Kim & Nelson, 2015). Nevertheless, collaborative efforts between public health and political domains have promoted harm reduction initiatives to address opioid overdose and are continuously developing today (National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division et al., 2017).

Naloxone Development

Prior to naloxone, individuals used a variety of strategies to prevent overdose death, including such folk remedies as placing ice on genitals or injecting concentrated saline solutions (Hanson et al., 1985; Maxwell et al., 2006). Many of these remedies were ineffective and often resulted in further complications (Hanson et al., 1985; Maxwell et al., 2006). In 1961, naloxone hydrochloride, also identified as naloxone, was patented and advertised as an alternative to methadone treatment for opioid users (Faulkner-Gurstein, 2017; National Institute on Drug Abuse, 2020; Zaks et al., 1971). A decade later in 1971, the U.S. Food and Drug Administration approved the use of intravenous, intra-muscular, or subcutaneous injection of naloxone hydrochloride, thus laying the foundation for naloxone use as a reliable medical intervention (Faulkner-Gurstein, 2017; Morgan & Jones, 2018). Naloxone is sanctioned as a safe medication and not recognized to cause harm when administered in conventional doses to opioid-naïve patients (Borras et al., 2004; Foldes et al., 1963; Foldes et al., 1969; Jasinski et al., 1967). The term *opioid naïve* suggests that an individual is not taking opioids on a daily basis, while those continuously taking opioids on a regular basis are considered *opioid*

tolerant (Hatton & Knudsen, 2012). Regardless of the frequency of opioid use, naloxone is effective on all classes of opioids, including prescription pills, heroin, and fentanyl (Faulkner-Gurstein, 2017). Furthermore, naloxone has an unscheduled regulatory classification, implying that it has no addictive or psychoactive properties and subsequently no potential for abuse (Faulkner-Gurstein, 2017). Serious adverse effects are rare, and naloxone has no effect on non-opiate users (Barsan et al., 1989; Borrás et al., 2004; Buajordet et al., 2004; National Institute on Drug Abuse, 2019b; Posner & Burke, 1985).

Naloxone Administration

Naloxone is currently available in three forms approved by the Food and Drug Administration: injectable, auto-injectable, and prepackaged nasal spray (Mowry et al., 2016; Tandberg & Abercrombie, 1982; Weber et al., 2012). The several devices have proved more efficacious in producing substantially high blood levels of naloxone than other naloxone devices previously used by first responders (National Institute on Drug Abuse, 2019b; National Institute on Drug Abuse, 2019c). While intravenous administration of naloxone delivers an immediate, fast-acting therapeutic effect (Doyle & McCutcheon, 2015), this injectable form of delivery is primarily executed by medical professionals (National Institute on Drug Abuse, 2019b) because of accessibility and means within medical settings. Inception of the third wave of the opioid epidemic in 2013 called for more accessible and effective interventions to manage the substantial increases in deaths related to synthetic opioids (Rudd et al., 2016; Scholl et al., 2019). In 2014, the autoinjector form of Evzio was designed for intramuscular or subcutaneous administration, and 1 year later, Narcan, the nasal spray, was developed for intranasal

administration (Morgan & Jones, 2018). Evzio and Narcan were created to increase the ease of administration within community settings because LEOs or laypersons are less likely than medical professionals to be equipped or trained to administer naloxone intravenously (National Institute on Drug Abuse, 2020). Although all forms of naloxone have recommended dosage guidelines, the dangerous effects of highly potent synthetic opioids, such as fentanyl, notably required increased doses of naloxone to reverse opioid overdoses, as indicated by emergency medical services (EMS) reports (Centers for Disease Control and Prevention, 2015; Faul, 2016). The increase in potency of synthetic opioids coupled with the substantial number of fatalities essentially challenged the notion of the most effective and appropriate dosage of naloxone (Faul, 2016 ; Groeger et al.,1983). Consequently, the Food and Drug Administration approved a newer version of Evzio, which delivers 5 times the initial dose administered by the original auto-injector device (Evzio, 2020; Traynor, 2016). Since the development of naloxone, there have been significant changes in how it is administered, by whom it is administered, and the therapeutic dosages. Despite such alterations, naloxone is an extremely safe medication and intervention for opioid overdoses (Williams et al., 2019).

Naloxone functions as a competitive opioid antagonist as it binds to *mu*-opioid receptors with a high affinity and at a lesser degree to *kappa*- and *gamma*-opioid receptors in the central nervous system (NCI Thesaurus, 2006). As a result of naloxone binding to opioid receptors, this medication reverses and inhibits the effects of opioid analgesics, such as euphoria, sedation, respiratory depression, miosis, bradycardia, and physical dependence (NCI Thesaurus, 2006). Naloxone transfers and equilibrates rapidly between the plasma and the brain, allowing the effects of naloxone to occur within

several minutes (Faulkner-Gurstein, 2017; Rzasalynn, & Galinkin, 2018). The effects can last from 30 minutes to 2 hours and are dependent on both the dosage of naloxone and quantity of opioids present in the body (Faulkner-Gurstein, 2017). Common opioid withdrawal symptoms that precipitate upon naloxone administration include body aches, diarrhea, increased heart rate and blood pressure, fever, rhinorrhea, goosebumps, sweating, nausea or vomiting, nervousness, restlessness or irritability, and weakness (ADAPT Pharma Inc. & NARCAN®, 2019). More severe reactions could include pulmonary edema, cardiovascular instability, and seizures, but they are rare at doses consistent with labeled use for opioid overdose (Dowell et al., 2016). The use of naloxone in postoperative patients with hypotension, hypertension, ventricular tachycardia and fibrillation, dyspnea, pulmonary edema, and cardiac arrest have resulted in death, coma, and encephalopathy. These occurrences are a significant rarity, and research to suggest the medication is unsafe is limited (Cunah, 2021).

The use of naloxone as a harm reduction tool was not immediately obvious because naloxone was solely used by trained clinical and medical professionals in emergency or inpatient settings (Faulkner-Gurstein, 2017; Morgan & Jones, 2018; Rzasalynn & Galinkin, 2018). The concept of peer-to-peer administration arose as a collective movement by drug user activists, front-line medical staff, and general supporters of harm reduction approaches (Faulkner-Gurstein, 2017). Across the United States, community-based organizations and some state public health departments began conducting and sponsoring overdose education and naloxone distribution (OEND) community-based programs in 1996 (Mueller et al., 2015). These programs provided naloxone to individuals who used opioids after being trained on opioid overdose prevention,

recognition, and response (Mueller et al., 2015). Consequently, access to naloxone outside of medical settings became more prominent and challenged the concept of naloxone as being effective only when used by medical professionals.

According to the Harm Reduction Coalition (n.d.), between 1996 and 2013, more than 152,000 laypersons were provided with training and naloxone kits. Research findings from communities with naloxone access programs suggest overdose mortality declines after implementation of these programs, and naloxone can be administered by laypersons with little or no formal training (Doe-Simkins et al., 2014; Walley et al., 2013). Program evaluations and meta-analyses of naloxone programs also suggest that they can be effective in preventing drug-related death (Breedvelt et al., 2015; Clark et al., 2014; Giglio et al., 2015; Green et al., 2008; McAuley et al., 2015; Walley et al., 2013). Despite significant results, the lack of standardization regarding collection of program evaluation data on OEND programs is a remarkable limitation (Smart et al., 2020). Future research should aim to develop standardization of OEND training programs and program evaluation to best equip trainees on recognizing and acting on opioid overdose scenarios.

Naloxone Policies and Laws

In line with the expansion of training laypersons to administer naloxone throughout the United States, LEOs became a population of interest to assist in combating the opioid epidemic (Goodison et al., 2019). Legal and public health efforts to involve LEOs ratified the development of policies and laws at both state and federal levels. In 2012, the Office of National Drug Control Policy pioneered by President Obama's administration necessitated the expansion of naloxone to first responders,

including LEOs (White House Office of National Drug Control Policy, 2013).

Additionally, the Executive Office strongly encouraged modification of laws or policies that have restricted LEO involvement related to access and use of naloxone (Kerilowske, 2012).

The Good Samaritan Law

The Good Samaritan law implemented in all 50 states and the District of Columbia was initially devised to protect physicians from liability when providing care outside of their clinical setting (West & Varacallo, 2020). Over time, the context of Good Samaritan laws has varied by jurisdiction, specifically who is protected from liability and under which situations (West & Varacallo, 2020). Since November 2017, 40 states and the District of Columbia have enacted Good Samaritan laws specific to opioid overdoses in attempts to address the increased rates of opioid overdoses and deaths (Nguyen & Parker, 2018). Drug overdose Good Samaritan laws are intended to provide an overdose victim with a greater chance of survival by increasing the probability that emergency services will be sought by others at the time of overdose (McClellan et al., 2018). Good Samaritan laws related to opioid overdose provide both victims and witnesses with a degree of immunity from drug-related charges. The nature of immunity depends on each state and can include immunity from drug possession as well as from possession of drug paraphernalia of both the witness and overdose victim. Other states reduce legal sentencing in acknowledgement of a Good Samaritan response (Davis & Carr, 2015; Davis et al., 2017).

In addition to the progression of Good Samaritan laws throughout the nation, naloxone access laws have followed similar trends in attempts to increase naloxone

access for various groups. First responders and laypersons, including family members and bystanders, are among the diverse groups targeted for increased access to naloxone (Rees et al., 2019). As of July 2017, all 50 states and the District of Columbia have established laws to expand naloxone access (Davis et al., 2017). Although laws have been implemented and continue to be modified, policies against and barriers to naloxone access remain prominent issues in cities and rural areas across the United States. Providing LEOs with naloxone in city and county agencies is particularly vital in locations where naloxone access remains limited (Goodison et al., 2019).

Act 139

In September 2014, Pennsylvania passed Act 139, also known as David's Law (Pennsylvania Department of Drug and Alcohol Programs, 2020). This law has made naloxone readily available to law enforcement agencies and laypersons via a standing order from Pennsylvania's Secretary of Health (Pennsylvania Department of Drug and Alcohol Programs, 2020). Act 139 also provides criminal, civil, and professional immunity to individuals who prescribe, dispense, and administer naloxone to an individual experiencing an overdose (Overdose Free PA, n.d.). Per Act 139, first-responder organizations, including police departments, are required to establish a written agreement with an EMS agency licensed by the Department of Health (Controlled Substance, Drug, Device and Cosmetic Act- Drug Overdose Response Immunity Act 139, 2014). Documentation of the overall use and of each dose of naloxone received by the pharmacy is required by each police department (Controlled Substance, Drug, Device and Cosmetic Act- Drug Overdose Response Immunity Act 139, 2014; Smyser & Lubin, 2018). Upon written agreement, naloxone was supplied to police departments and

became free of charge to all police departments in Pennsylvania as of January 2017 (FOX43 Newsroom, 2017). Governor Tom Wolf has been a proponent of increased naloxone access, as evidenced by his proposed state budget in 2017 to use \$10 million to equip both first responders and law enforcement with naloxone (FOX43 Newsroom, 2017). Financial contributions from state grants and health insurers have covered the costs of naloxone. However, one should consider the future costs of naloxone as a medication and its possible impact on police departments and taxpayers (Commonwealth of Pennsylvania, 2015).

The advancement of overdose Good Samaritan laws and naloxone access laws has been under consideration from political and public health personnel during the past 2 decades. Prestigious national organizations, such as the Centers for Disease Control and Prevention, the American Medical Association, and the American Pharmacists Association, substantially advocate for increased naloxone access across the United States (Lim et al., 2016). However, arguments and issues have risen against opioid overdose interventions. Primary concerns regarding increased naloxone access include (a) unintentional increase of illicit opioid use, (b) minimization of the adverse effects and degree of lethality of opioids as a result of access to and reliance on naloxone; and (c) safety (Bazazi et al., 2010; Kim et al., 2009; The National Association of State Alcohol and Drug Abuse Directors, 2013). Furthermore, providers have argued that naloxone might provide a false sense of immunity from overdose death, leading an individual to increase quantity and frequency of opioid use, or to engage in other hazardous behaviors (Green et al., 2013; Kirane et al., 2016). Safety is a significant area of concern in relation to increasing access of naloxone to laypersons. Essentially, laypersons now have a

greater opportunity to administer medical care without proper training or knowledge on what constitutes an opioid overdose and how to effectively reverse an overdose (The National Association of State Alcohol and Drug Abuse Directors, 2013). As a safety measure, some states throughout the country require that laypersons who obtain and intend to administer naloxone receive overdose training (The National Association of State Alcohol and Drug Abuse Directors, 2013).

Naloxone Access Impacting Opioid Use

Fear of law enforcement involvement is the primary factor in substance users' reticence to use emergency medical assistance in the event of an overdose emergency (Bohnert et al., 2011; Burris et al., 2009; Darke et al., 2000; Green et al., 2009; Pollini et al., 2006; Sherman et al., 2007; Tobin et al., 2005; Tracy et al., 2005). With increased naloxone access, substance users might be less likely to use EMS, as studies have revealed significant percentages of PWID do not call or delay calling EMS (Clark et al., 2014). The most commonly reported reasons PWID do not seek EMS are they do not consider it necessary (Bennett et al., 2011; Bohnert et al., 2011; Pollini et al., 2006; Tobin et al., 2005; Tobin et al., 2009; Tracy et al., 2005; Wright, et al., 2006) and/or fear of police (Baca & Grant, 2007; Bennett et al., 2011; Bohnert et al., 2011; Enteen et al., 2010; Follett et al., 2014; Lankenau et al., 2012). Peer-to-peer administration of naloxone may be deemed sufficient and reinforce a substance user's belief that EMS is not necessary.

Medical providers have advised against the use of naloxone as a sole form of treatment for opioid overdoses, as various physiological complications can arise from an opioid overdose (Green et al., 2013). Respiratory depression from an opioid overdose is

the major cause of morbidity and mortality, and individuals with existing lung disease or complications are at greater risk of respiratory distress and death compared to healthy individuals (Schiller & Mechanic, 2019). Individuals who do not have any preexisting pulmonary or lung complications are still at risk of experiencing acute lung injury caused by the adverse effects of opioids on the respiratory and central nervous systems (Concheiro et al., 2018; Moriya & Miller, 2018; Wang, 2019). Cardiac arrest or loss of consciousness from an opioid overdose is likely to have been caused by hypotension, hypoxia, or poor perfusion of the brain, resulting in poor outcomes and prognoses. Although rare, seizures, acute lung injury, or adverse cardiac events following an opioid overdose are serious medical complications that may occur (Schiller & Mechanic, 2019). Owing to the detrimental effects of opioid overdose, medical professionals have expressed great concern about increased naloxone access and its implications on opioid use (Kilwein et al., 2019).

Research findings that examined the association between naloxone access laws or Good Samaritan laws and nonmedical opioid use have not revealed evidence of increases in opioid use (Bazazi et al., 2010; Kim et al., 2009). Moreover, no current evidence has been found to support the widely held assumption that naloxone access will increase opioid use amongst individuals (Bazazi et al., 2010; Kim et al., 2009; Maxwell et al., 2006; Seal et al., 2003). One study (Doleac & Mukherjee, 2019) claimed that increased naloxone access has no beneficial effects and may indeed increase opioid use, opioid-related emergency room visits, and criminal activity, and no reduction in opioid-related deaths. Findings from the study revealed that naloxone access led to a 14% increase in opioid-related deaths and an 84% increase in fentanyl-related deaths in midwestern states

(Doleac & Mukherjee, 2019). Although these findings seem noteworthy, effects on opioid-related mortality were not significant for northeastern and western regions, while significant for southern and midwestern regions (Doleac & Mukherjee, 2019). This study has been described as methodically flawed, along with containing improbable conclusions (Frank et al., 2018).

The natural experiment approach as a means of measuring the influence of naloxone access laws/policies per state on opioid use presents significant econometric issues. This is primarily because development and implementation of naloxone access laws across the United States did not commence until mid to late 2015; therefore, such findings do not capture current effects of naloxone access laws (Frank et al., 2018). Ongoing evaluation of naloxone access expansion, use of EMS, and mortality rates should continue as communities adopt and modify policies. Lastly, future studies outlining the effects of naloxone access laws on opioid use and mortality rates should be critically evaluated because scientifically flawed studies might exacerbate misinformed assumptions of the general public.

Knowledge of Opioid Overdose and Naloxone

A majority of research findings have not deemed standard knowledge of substance use (i.e., physiology, biochemistry, symptoms, diagnosis, treatment, epidemiology, and other psychosocial stressors) as an integral factor associated with attitudes (Bush & Williams, 1988; Geller et al., 1989; Jacka et al. 1999; Kinder, 1975). A recent study that assessed LEOs' opioid overdose knowledge and attitudes before and immediately after a 30-minute in-person training on overdose and naloxone administration revealed findings consistent with this notion (Wagner et al., 2016).

Results demonstrated statistically significant increases in LEOs' knowledge across all several opioid competencies; however, LEOs' attitudes toward overdose victims remained consistent (Wagner et al., 2016). Several recent studies revealed that in-person naloxone training can increase LEOs' naloxone competency and mitigate degrees of concern regarding administration (Ashrafioun et al., 201; Purviance et al., 2017; Saucier et al., 2016; Wagner et al., 2016). Generally speaking, brief naloxone education and training can enhance knowledge regarding overdose prevention (Behar et al., 2015), thereby reinforcing the importance of exposing LEOs to naloxone training opportunities.

Opioid Overdose and Naloxone Training

Research has steadily indicated that opioid overdose and naloxone training increases overdose-related knowledge, as well as appropriate use and administration of naloxone (Saucier et al., 2016; Wagner et al., 2016). Furthermore, current evidence implies that individuals among the general public who have received some form of training can and do use naloxone if they witness an overdose (Clark et al., 2014; Strike et al., 2013). Such findings imply that an individual's degree of knowledge may be sufficient to influence likelihood of naloxone administration, regardless of their stance on addiction and substance users. Despite improved substance-related competencies that may result from LEOs' training and experience, the evidence to support a distinct association between knowledge and attitudes is insufficient (Cornfield, 2018). Consequently, the literature examining potential predictors of attitude toward addiction has steered away from including knowledge as a determinant (Cornfield, 2018), also reinforcing the concept that either factor could contribute to LEOs' likelihood of naloxone administration. LEOs must receive the most objective and educational forms of

naloxone and opioid overdose training by competent instructors because knowledge may, in fact, increase LEOs' likelihood of naloxone administration. As of March 2018, 2,340 law enforcement agencies in 42 of the 48 states self-reported to a national data repository that they were equipped with and currently administering naloxone within their respective communities (Lurigio et al., 2018). Similar to the training format offered to laypersons, the design of naloxone training programs offered to LEOs varies from in-person to online training modules. A primary reason for the heterogeneity in training modalities stems from differing statewide regulations and specific authorizations LEOs require in order to be granted accessibility to naloxone (Davis et al., 2015). Because police departments procure naloxone via local and state health departments, EMS, or community organizations, agencies must comply with the most stringent statewide naloxone rules of conduct. These regulations obligate police departments to conduct naloxone training in accordance with statewide guidelines, including specific curricula, training hours, and other continuing training and education requirements (Lurigio et al., 2018). Pennsylvania leads the nation in offering the most naloxone training programs to LEOs, with a total of 289 programs (Lurigio et al., 2018).

Philadelphia Police Department Naloxone Administration Program

In Philadelphia, fentanyl and fentanyl-analog-related deaths began to rise in 2014 and gradually increased through 2017 (The Department of Public Health: City of Philadelphia, 2020). In 2015, more than twice as many deaths were from drug overdose in Philadelphia as from homicide (Farley, 2019). In response to drastic increases in drug-related deaths, Deputy Police Commissioner Christine Coulter initiated the process of integrating naloxone training programs in the Philadelphia Police Department in January

2015 (Rybak, 2017). By February 6, 2015, the Philadelphia Police Department implemented a Naloxone Administration Program policy that delineated regulations and protocols on use of naloxone for trained personnel (Philadelphia Police Department, 2015). The naloxone training program was first introduced in the East Division followed by the Northeast Division, as both regions used the most naloxone among all divisions within the Philadelphia Police Department (Rybak, 2017). Current naloxone training offered to Philadelphia LEOs across all districts is primarily available online, and the training program must be within specific public health legal guidelines, including The Pennsylvania Controlled Substance, Drug, Device and Cosmetic Act §780-113.8(A)(2) or under subsection (A)(3) of said Act to administer Naloxone (The Pennsylvania Controlled Substance, Drug, Device and Cosmetic Act, 1972; Philadelphia Police Department, 2015; Smyser & Lubin, 2018). Assessment of competencies, including the recognition of physical/behavioral signs of opioid overdose, the knowledge of naloxone and administration, and the recognition of an, effective response to an overdose situation, differs among psychometric instruments or surveys used in naloxone training programs nationwide (Strang et al., 2008; Williams et al., 2013).

Owing to the nature of heterogeneity between training program learning objectives, assessment of competencies, and target populations, evaluating the effectiveness of naloxone training programs has been difficult (Giglio et al., 2015). A lack of randomized controlled trials examining opioid overdose prevention programs that include naloxone distribution limits assessment of these developing programs and generalizability to inform development of future training programs (Boyer, 2012). While naloxone and opioid overdose training programs continue to be evaluated and modified,

program evaluation research is substantially necessary to inform development of future training programs for LEOs and other essential professionals within the medical and clinical realms.

Refusal to Administer Naloxone

Not all 50 states have openly welcomed the concept of naloxone in police departments, and numerous high-ranking LEOs across the nation have verbalized ethical and legal concerns. Several common arguments against the implementation of naloxone programs in police departments involve the differing roles between LEOs and medical personnel, contradiction of LEOs' policing role, and acceptability or legal tolerance of drug use among the community (Lee et al., 2018). Because LEOs do not receive comprehensive medical training as do other first responders, including emergency medical technicians (EMTs) and firefighters, LEOs could potentially induce greater harm to individuals overdosing from opioids (Lee et al., 2018). Owing to the diverse nature of opioid overdose symptoms, LEOs may misconstrue symptoms of medical conditions, such as hypertension, hyperglycemia, or an allergic reaction, as an opioid overdose. Inability to differentiate an opioid overdose from a medical condition consequently places an individual in danger or could result in death (Hayes, 2017). Although naloxone has no effect on nonopioid users (Buajordet al., 2004), medical conditions that require immediate treatment may be overlooked and negatively impact an individual's health status. Although Good Samaritan laws and policies protect LEOs from legal liability, ethical responsibilities have also been strongly considered by police departments who protest naloxone use (Lee et al., 2018).

Changes in Policing

During the past 4 decades, policing strategies have developed in response to drastic political shifts, laws, and public health concerns (Green et al., 2013). Criminal justice systems have progressively transitioned from aggressive policing of minor and drug-related crimes to a more problem-solving outlook in addressing substance use or drug possession in communities (Bohnert et al., 2011; Hawkins et al., 2007; Morabito et al., 2013; Rivers et al., 2012). Despite the transformation of policing approaches, LEOs must uphold and enforce federal, state, or local laws pertinent to illicit drug use and drug possession, and maintain public order and safety. Law enforcement administrations have argued that the primary duties of LEOs are essentially contradicted if LEOs do not investigate or target drug-related activity, but rather provide medical care to individuals involved in illicit drug use (Lee et al., 2018). Such discrepancy is evident between the differences in federal law and enforcement of law at local levels across the United States. Today, longstanding societal norms and expectations of LEOs to maintain order as it relates to drug activity are being challenged by harm reduction interventions, such as naloxone. Although LEOs have historically been idolized for their heroic acts and for saving lives, equipping LEOs with naloxone remains a topic of controversy, as it conflicts with deep-rooted perspectives of policing (Donohue, 2018). The dual role inherited by LEOs as both law enforcer and provider of medical treatment may evoke cognitive dissonance for LEOs, as well as role or identity conflict (Lee et al., 2018).

Tolerance of Substance Use

Another argument against the implementation of naloxone programs in police departments is that if LEOs carry naloxone and adopt programs in their respective state or

town, a general message of legal tolerance and condoning of drug use may be falsely perceived by the community. Consequently, because of the misleading nature of social acceptance of substance use held by LEOs carrying naloxone, opponents contend the notion that opioid use in those communities will contribute to the progression of the opioid epidemic (Lee et al., 2018). An observational study in Ohio contended this notion by revealing that increases in the number of LEOs trained and carrying naloxone was associated with a reduction in opioid overdose deaths, as well as an increased survival rate among opioid overdose victims in the community (Rando et al., 2015). Furthermore, in regard to naloxone access within communities, Massachusetts found a decrease in the number of deaths related to opioid overdose over a 3-year period in 2006 to 2009 following implementation of state-supported OEND programs (Walley et al., 2013). These findings suggest that the increase in community-based OEND programs and increase in naloxone programs across police departments reduce the number of fatalities, denouncing the idea that these programs will advance the opioid epidemic.

Aggression/Aggressive Behaviors

The potential for an overdose victim to become aggressive, combative, or irritable immediately following administration of naloxone is another common concern (Smyser & Lubin, 2018). Although irritability and restlessness are common side effects noted by NARCAN[®] Nasal Spray (ADAPT Pharma, Inc. & NARCAN[®], 2019), minimal findings have identified aggression/aggressive behaviors as predominant reactions by opioid overdose victims who received naloxone. Studies revealed that overdose victims are agitated or aggressive when revived with naloxone at estimated rates of 15% and 30% (Buajordet et al., 2004; Kerr et al., 2008). Furthermore, two case reports from 1992

observed violent patient behavior following administration of intravenous naloxone, but neither patient was a substance user (Gaddis & Watson, 1992). Limitations in the two case reports described are significant because neither includes substance users, the conclusion that those findings could be generalized to opioid users is inconceivable (Marino & Escajeda, 2019).

Methodologically flawed research findings (Osterwalder, 1996) have contributed to the misinformed notion that opioid overdose victims react in an aggressive manner, and studies examining naloxone-induced assaults by opioid users have infrequently been replicated in current literature. Insufficient and inaccurate findings are likely to strengthen the myth of opioid overdose victims' aggressive reactions after receiving naloxone (Marino & Escajeda, 2019). Richard K. Jones, the sheriff of Butler County, Ohio, identified the likelihood of aggressive behaviors and agitation from overdose victims as a reason for his refusal to allow LEOs in Butler County to carry naloxone (Wootson, 2017). Police departments and LEOs who have jurisdiction over development and implementation of naloxone programs across the United States may espouse similar beliefs to those of Richard K. Jones. Unfortunately, such concerns are not supported by any significant evidence and further add to the stigma toward opioid users.

Health and Safety of LEOs

Law enforcement is characterized as a high-risk, high-stress occupation because of the various responsibilities and situations LEOs may encounter during their daily work shifts. In fact, research findings have revealed that the rate of occupational deaths in law enforcement is nearly 3 times higher than that of the average worker in the United States (Maguire et al., 2002). According to the 2017 Bureau of Labor Statistics' Annual

National Census of Fatal Occupational Injuries report, a total of 95 fatal injuries among police officers increased 14% for a total of 108 fatalities in 2018 (The United States Department of Labor, 2019). The most common fatal accidents were characterized by violence and other injuries by persons or animals. Safety, health, and wellness of LEOs are areas of concern that have received extensive attention from occupational health organizations, as well as police departments (Densten, 2001). It has been suggested that the opioid epidemic exacerbates existing concerns about LEOs' health and safety because LEOs are more likely to encounter drug-related scenarios at a greater frequency than in past years (Goodison et al., 2019; Thomas & Schwartz, 2019). Furthermore, increased exposures to infectious diseases, hazardous chemicals, such drug paraphernalia as needles, or drugs containing fentanyl are significant health and safety risk factors related to the opioid epidemic (Burgess et al., 1996; Herbert et al., 2006; Pagane et al., 1996). As the presence of fentanyl initially increased in 2014 (Zoorob, 2019), recommendations to protect first responders from occupational exposure to fentanyl were developed by various public and private sector sources (Howard & Hornsby-Myers, 2018). In November 2017, the National Institute for Occupational Safety and Health, a division of the Centers for Disease Control, established exposure prevention recommendations for first responders, reinforcing the significance of LEOs' safety (Howard & Hornsby-Myers, 2018).

Coronavirus (COVID-19)

Beginning in late February 2020, the United States became afflicted with another public health crisis, COVID-19. On February 26, 2020, the first cases of COVID-19 were confirmed in the United States and aggressively spread throughout the nation and

other countries worldwide, resulting in a global pandemic (CDC COVID-19 Response Team et al., 2020). COVID-19 is an infectious disease considered to be transmitted from person to person via inhalation or contact with respiratory droplets produced by an infected person's cough or sneeze (Singhal, 2020; World Health Organization, 2020). These infected droplets may land in the mouths or noses of individuals who are within close proximity or may potentially be inhaled into the lungs (World Health Organization, 2020). Owing to the novelty of COVID-19, a thorough understanding of transmission risk remains uncertain and continues to be examined by epidemiologists. To date, person-to-person transmission has been noted to be the main means of infection transfer and is more probable when individuals are within approximately 6 feet from one another (Centers for Disease Control and Prevention, 2021; McIntosh et al., 2020). The incubation period is believed to range from 2 to 14 days, with an average time of 4 to 5 days from exposure to COVID-19 to onset of symptoms (Lauer et al., 2020; Li et al., 2020; Singhal, 2020).

Clinical Presentation

The clinical presentation of COVID-19 appears to vary among individuals beginning with disease onset and course of the illness, making it difficult for the general public to distinguish between other medical conditions that mimic COVID-19 symptoms (Woodward & Gal, 2020). Individuals will likely display a combination of the following signs and symptoms: fever, cough, fatigue, loss of appetite, shortness of breath, and myalgia; another complicating factor of COVID-19 is that individuals may be asymptomatic (Chen et al., 2020; Huang et al., 2020; Pan et al., 2020; Wang et al., 2020; Xu et al., 2020). In regard to the course of illness, severity of COVID-19 could range

from mild to critical, with age being a strong risk factor influencing illness severity (Centers for Disease Control and Prevention, 2020d; Wu & McGoogan, 2020). The clinical presentation has gradually transformed since the origin of COVID-19 and continues to be closely examined by researchers in public health domains.

COVID-19 Incidence Rates

Although numerous regions throughout the nation have indicated higher disease rates in comparison to other areas (Johns Hopkins University, 2020), the pandemic has collectively impacted the general public at large. COVID-19 incidence rates among police departments in major cities, including New York, Philadelphia, Detroit, Houston, and Washington DC, have similarly followed an upward trend within their respective departments (Bleiberg & Williams, 2020). In May 2020, Governor Andrew Cuomo declared that 10.5% of the New York Police Department had tested positive for COVID-19 antibodies, suggesting that an estimated 3,700 LEOs had been infected and recovered from COVID-19 (Lardieri, 2020; New York City Police Department, 2020). In April 2020, approximately 140 LEOs from the Philadelphia Police Department tested positive for COVID-19 (Gambacorta, 2020). The month of November 2020 produced the highest COVID-19 positive test results, a reported total of 465, 4 times more than the second highest COVID-19 results in April 2020 (Laughlin & Bender, 2020). As of December 4, 2020, at least 880 LEOs and other civilian staff had tested positive for COVID-19. Furthermore, a total of 3,435 staff members of nearly 6,500 employed by the Philadelphia Police Department had to quarantine in 2020 for the following reasons: exposure to COVID-19, signs and symptoms of COVID-19, and traveling to a COVID-19 hot spot (Laughlin & Bender, 2020). Clearly, the Philadelphia Police Department was adversely

affected by the pandemic in 2020, often resulting in understaffed police districts, given the considerable demand for active officers and 911 dispatchers. Unfortunately, this dilemma was common for police departments nationwide despite their ongoing efforts to maintain the health and safety of department employees via use of allotted resources.

COVID-19 Fatality Rates

As COVID-19-related data continue to be collected, analyzed, and interpreted, one of the most imperative statistics highlighted by public health and medical research experts is the COVID-19 case fatality rate. The fatality rate captures the number of individuals with a diagnosis of COVID-19 who die as a result of the infectious disease. The case fatality rate differs from mortality rates (Centers for Disease Control and Prevention, 2011a). The proportion of a population who die as a result of the pandemic compromises the mortality rate, which commonly diverges from the case fatality rate. This ratio is a result of the notion that an entire population has essentially not been exposed to the infectious disease (Centers for Disease Control and Prevention, 2011a). Estimated fatality rates projected by the CDC have been adjusted accordingly, based on trends of statewide incidence rates; however, experts argue that imperative factors have not been completely considered in the estimated death rates from the emergence of COVID-19 (Richardson, 2020). Although the access to and opportunities for COVID-19 testing have increased since development and dissemination of various COVID-19 assessments (Manabe et al., 2020), one should consider the initial barriers to testing: Both viral and antibody tests were dispensed at the discretion of state and local health departments or medical providers (Centers for Disease Control and Prevention, 2020f). Data outlining the nature of current and projected COVID-19 fatality rates are limited as

a result of the availability and access to testing over the course of the pandemic (Richardson, 2020).

COVID-19 Fatalities of LEOs

In the first several months of the pandemic, numerous police departments throughout the United States, including California, Colorado, Florida, Illinois, New Jersey, New York, and Louisiana, began reporting COVID-19-related deaths of LEOs (Police1, 2020). As the infectious disease spread nationwide, police departments across many geographic locations eventually encountered comparable challenges in maintaining the health and safety of LEOs while they performed day- to-day law enforcement duties (Cortez, 2020). Consequently, COVID-19-related deaths of LEOs continued to increase over the course of 2020 (Laufs & Waseem, 2020), similarly to the increase in the general public. Preliminary data gathered by The National Law Enforcement Officers Memorial Fund indicated that COVID-19-related fatalities were the single highest cause of officer line-of-duty deaths in 2020, while firearms-related fatalities ranked second (National Law Enforcement Officers Memorial Fund, 2021). A total of 264 LEOs from various jurisdictions, including federal, state, military, tribal, and local police departments, died in the line of duty, the highest number of deaths since 1974 (National Law Enforcement Officers Memorial Fund, 2021).

From the 264 total deaths, 145 of the LEOs were confirmed by their agencies to have been active in the line of duty and either had a diagnosis of COVID-19 or had evidence suggesting the LEO had COVID-19-related complications at time of death (National Law Enforcement Officers Memorial Fund, 2021). Forty-eight LEOs died in firearms-related activity, a notable 6% decrease in firearm fatalities in 2019 (National

Law Enforcement Officers Memorial Fund, 2021). As testing and data related to COVID-19 drastically developed in the latter months of 2020, the National Law Enforcement Officers Memorial Fund continued to confirm more COVID-19-related fatalities in 2020. Public health professionals anticipate that COVID-19 fatalities and the total number of line-of-duty deaths will ebb and flow as public health, government, and personal choice factors intersect (National Law Enforcement Officers Memorial Fund, 2021; Scudellari, 2020).

First Responder Protocols During COVID-19

Police departments have been urgently tasked to implement protocols and procedures to mitigate and prevent transmission of COVID-19. The Centers for Disease Control and Prevention has allied with first-responder personnel throughout the United States and supplied them with general guidance on identifying exposure risk and proceeding with day-to-day occupational roles/responsibilities (International Association of Chiefs of Police, 2020). The considerations for agency action of the Centers for Disease Control and Protection entail adjustments in daily communication among law enforcement personnel and training on use of personal protective equipment (PPE) while adhering to universal health and safety precautions, including social distancing (International Association of Chiefs of Police, 2020). Furthermore, LEOs who must make contact with individuals suspected or confirmed to have COVID-19 are recommended to follow guidelines from the Centers for Disease Control and Protection that are primarily intended for fire services, EMS, and emergency management officials (Centers for Disease Control and Prevention, 2020e). Although the use of PPE is a routine procedure for LEOs, COVID-19 has induced a greater value on the use of face masks, eye

protection, and gloves when interacting with the general public (Satula, 2020). Owing to the increased requirement of PPE across various healthcare professions and first responders, shortages of PPE quickly developed as an additional barrier for LEOs in fulfilling their daily duties (The Department of Homeland Security Science and Technology, 2020).

COVID-19 Changes in Policing Strategies

Despite the occurrence of previous public health emergencies in the United States, COVID-19 has created many novel challenges for law enforcement agencies, especially regarding the way LEOs manage law and order (Brooks & Lopez, 2020; Laufs & Waseem, 2020). Limited availability of PPE, COVID-19 infection rates among police personnel, and LEO staffing shortages have required police agencies to adjust their policing strategies and enforcement of laws (The Department of Homeland Security Science and Technology, 2020). Given the differences in jurisdiction at the state and local levels of law enforcement, agencies have had to quickly modify and execute policing strategies most compatible with their respective resources and needs. Previously developed policing strategies in response to public health crises certainly aid and inform the current strategies; however, research on the short- and long-term efficacy and effectiveness of policing is limited (Laufs & Waseem, 2020). A combination of the unexpected development of COVID-19, lack of policing standardization across police agencies during public health emergencies or natural disasters, and limited research on short- and long-term effects of policing strategies during these events, among other factors, has influenced significant differences in policing strategies nationwide.

Many emergency measures taken by law enforcement agencies have reduced the number of opportunities for a LEO to be in close proximity to members of the public (National Police Foundation, 2020). Although law enforcement agencies vary with their implementation of policing strategies, commonly noted strategies have shifted to rely heavily on 911 dispatchers. As reduction of in-person contact between LEOs and the general public has been a key objective of law enforcement agencies (National Conference of State Legislatures, 2020), 911 dispatchers have been tasked to meticulously screen telephone calls in greater detail than before the pandemic (The Centers for Disease Control and Prevention, 2020e). Not surprisingly, 911 dispatchers are overworked given the drastic adjustments in 911 dispatchers' assessments of the nature of emergency, inquiries about COVID-19 signs/symptoms of callers and those involved on the scene, and allocation of calls to appropriate first responders (The Centers for Disease Control and Prevention, 2020e). Overburdened workers appear to be a common theme for 911 dispatchers across the United States and also true for Philadelphia Police Department dispatchers (Bender, 2020; Krouse, 2020; McCormick, 2021; Wan, 2020). These recent declarations beg the need to expand on the evaluation of short- and long-term effects of policing strategies, especially because 911 dispatchers play such critical roles in serving the general public and coordinating with first responders.

Additional COVID-19-related modifications across law enforcement agencies have relied more heavily on use of the following: citations, tickets, or summons and online law enforcement agency platforms (Brennan Center for Justice, 2020; Lum et al., 2020). LEOs have been redirected to adopt the public health model of "do no harm" when interacting with the general public and determining the need for arrest or use of

force (Chung et al., 2020). Arrests are essentially deemed a last-resort action, a significant adjustment for LEOs who primarily use this policing strategy. To ensure policing interventions align with public health guidelines, larger cities across the United States began to issue tickets or summons in lieu of arrests for minor crimes (Bleiberg & Williams, 2020). Emergency situations deemed as low risk or that do not require the presence of LEOs are more frequently diverted to other first responder personnel, such as EMTs, who could effectively and efficiently respond to health-related crises (Brooks & Lopez, 2020; Occupational Safety and Health Administration, 2021; Police Executive Research Forum, 2020). Means of communication among LEOs have also transitioned from in-person meetings to online or telephone and, dissemination of crime reports have also followed this trajectory (Bleiberg & Williams, 2020).

On foot patrol duties and interactions with community members have been reduced as the result of various state, county, and city social distancing guidelines and recommendations from law enforcement organizations (International Association of Chiefs of Police, 2020). Law enforcement agencies across the nation have transitioned their patrolling responsibilities from a combination of on foot and various modes of transportation (e.g., bicycles, motorcycles, patrol cars) to an increased use of patrol cars (Hermann et al., 2020). Reduced interactions between LEOs and community members in addition to cancellation of community-oriented policing and outreach initiatives have been identified as potential threats to the progression of community-oriented policing (National Police Foundation, 2020). In order to maintain a sense of connection and rapport between law enforcement and communities during COVID-19, community-oriented policing programs and advocacy efforts have altered their means of

communication from in-person meetings to a variety of online social platforms (i.e., online meetings). These adjustments underscore the importance of the relationship between community members and LEOs, as well as the need to assess effectiveness of online social platforms both in short- and long-term policing strategies. Many of these unprecedented policing strategies in response to COVID-19 could further refine the degree of rapport between law enforcement agencies and the general public, as well as reduce rates of crime, a primary goal of community policing (Schlosser, 2020).

Naloxone Administration and COVID-19

Police departments at state and local levels have also considered their roles in the opioid epidemic while balancing procedural adjustments from the rapidly developing pandemic. Some police departments have decided to temporarily suspend administration of naloxone until COVID-19 and its effects subside (Feder, 2020; Gelardi et al., 2020; Kuwabara-Blanchard, 2020a). The police department in Lawrence, a city in Marion County outside of Indianapolis, is one agency that has received significant backlash from the community and harm reduction advocates (Kuwabara-Blanchard, 2020a). Police Chief Dan Hofmann rationalizes his decision to withhold naloxone administration and allow EMS to respond to overdose emergency calls because of concerns of COVID-19 transmission to responding LEOs (Kuwabara-Blanchard, 2020a). While COVID-19 was aggressively evolving and a significant increase in overdose-related calls in central Texas were noted in April 2020, the Austin Police Department refused a naloxone donation that would equip every LEO within the police department (Newberry, 2020). Police Chief Brian Manley from Austin Texas indicated naloxone administration is not within LEOs'

daily duties and that training the police department on naloxone administration is not relevant because EMS are also readily available (Newberry, 2020).

Although these police departments have chosen to suspend or disallow naloxone administration, Dr. Michael Kaufman, Indiana's medical director of emergency medical services, suggested minimal to no research indicates that administration of any intranasal medication would result in the production of airborne particles or respiratory droplets that could be pathogenic (Kuwabara-Blanchard, 2020b). In fact, intranasal administration initially results in the medication going inward through the nasal mucosa, which is a targeted area of absorption. The nasal mucosa contains an abundant number of blood vessels, ensuring a rapid absorption of most drugs and generating high systemic blood levels (Marx et al., 2015). An important feature of intranasal medication is its noninvasive route of administration (Grassin-Delyle, et al., 2012), thus allowing for ease in self-administration or the administration of medication by others. Furthermore, intranasal medication has demonstrated a low potential for injuries or disease transmission, including hepatitis B and HIV (Marx et al., 2015).

Professionals argue that intranasal naloxone administration would not prompt the individual overdosing on opioids to sneeze or cough until after the administration is completed (Kuwabara-Blanchard, 2020b). Following naloxone administration, acute withdrawal symptoms, such as nausea, vomiting, and cardiac arrest (Jordan & Morrisonponce, 2020), could entail coughing and sneezing, thus reinforcing the importance of PPE use by first responders. Dr. Roger Crystal, CEO of Narcan's patent holder, Opiant Pharmaceuticals (Kuwabara-Blanchard, 2020b), along with Dr. Michael Kaufman have proposed minor adjustments to the naloxone administration process, such

as facing away from the individual while administering naloxone and remaining at least at an arm's-length distance or retracting 6 feet away from the individual following administration of naloxone (Kuwabara-Blanchard, 2020a). Numerous police departments with naloxone accessibility have solely adjusted their safety precautions to reflect COVID-19 guidelines recommended by the Centers for Disease Control and Prevention rather than completely suspend naloxone administration (DrugFreeCT.org, 2020). Regardless of adjustments in the naloxone administration process, protocols highlight the urgency in which naloxone should be administered to individuals with suspected opioid overdose (Opioid Overdose Prevention Initiative, 2020; Substance Abuse and Mental Health Services Administration, 2020).

The Substance Abuse and Mental Health Services Administration released a statement on May 8, 2020, addressing first responders' reticence or refusal to administer naloxone because of concerns of contracting COVID-19. Use of PPE and different forms of naloxone, including intranasal and intramuscular, was recommended by the Substance Abuse and Mental Health Services Administration to minimize LEOs' exposure to COVID-19. Intramuscular naloxone was identified as a lower risk option compared to intranasal naloxone because the medication is administered via injection into the thigh muscle, farther away from the nose and mouth area required for intranasal administration (Substance Abuse and Mental Health Services Administration, 2020). Since the development of the autoinjector form of naloxone that is administered intramuscularly and of intranasal naloxone, many more police departments started to use these forms of naloxone beginning in 2014 and 2015 (Gasior, 2018; Morgan & Jones, 2018). Alternatives in route of administration are an appealing characteristic of

naloxone, a contributing factor to its ongoing use by police departments. Although forms of naloxone vary among police departments as a result of supplementation from local and state health departments, EMS, or community organizations (Lurigio et al., 2018), both forms are effective in reversing opioid overdoses (Dietze et al., 2019).

The Substance Abuse and Mental Health Services Administration (2020) strongly encouraged first responders to continue naloxone administration and described the refusal of naloxone use as comparable to withholding cardiopulmonary resuscitation to an unresponsive individual who may have experienced cardiac arrest. The underlying message behind the statement by the Substance Abuse and Mental Health Services Administration suggests a disease model of addiction perspective, being that OUD is comparable to a medical complication and should be managed in a similar fashion. As use of PPE is considered a primary means of defense from contraction or transmission of COVID-19 among other transmittable diseases (University of Maryland, 2020), LEOs' accessibility to PPE is crucial so they have the opportunity to safely administer naloxone and assist individuals in need.

Fear and Concerns of COVID-19

Fears and concerns about COVID-19 transmission, staffing, and training opportunities appear to be a common theme among police departments, thus prompting high-ranking LEOs to rapidly respond based on availability of resources, perception of safety, and levels of risk (Jennings & Perez, 2020). Nonetheless, it is suggested that in comparison to other medical conditions, fear is a primary feature associated with infectious diseases, namely fear of transmission, morbidity, and mortality (Ahorsu et al., 2020). Given the increased number of LEOs nationwide testing positive for COVID-19

and LEOs' exposure to an individual with the virus over the course of 2020 (Cave & Dahir 2020; National Police Foundation, 2020), LEOs have imparted fears and concerns about their safety and health, as much uncertainty remains regarding transmission risks of COVID-19 (Berman, 2020; Bleiberg & Williams, 2020). Furthermore, LEOs' fears and concerns have remarkably included concern for the health of their families (Schuppe, 2020).

Fear is a complex construct that has been widely debated between psychological and biological realms, and even though many theories attempt to explain fear, the context-dependency of fear memories is noteworthy as it relates to LEOs' encounters with the general public (Adolphs, 2013). The context-dependency of fear memories considers the eliciting circumstances, type of threat, distance to the threat, and time elapsed since a threat was encountered (Adolphs, 2013; Fanselow & Lester, 1988). Given the recurring encounters LEOs may have with opioid overdose victims and concerns of aggression or aggressive behaviors (Smyser & Lubin, 2018), LEOs are likely to develop specific fear-related memories associated with opioid overdose situations. Furthermore, physical distance (i.e., proximity) is acknowledged as one of the most basic stimulus cues to trigger fear (Blanchard & Blanchard, 1990), and fears surrounding COVID-19 could potentially exacerbate preexisting fears and consequent responses. Individuals' decision-making processes and skills are likely to be impaired when experiencing a heightened degree of fear (Adolphs, 2013; Blanchette & Richards, 2010), a troublesome situation for LEOs who must hastily respond to emergency situations.

LEOs' Mental Health

Owing to the development of COVID-19 and its associated hindrances to daily functioning and routine, LEOs' mental health is a component of wellness that is at significant risk of being impaired, similarly to that in the general public (Kumar & Nayar, 2020; Stogner et al., 2020). The World Health Organization (2020) hypothesizes an increase in rates of loneliness, anxiety, depression, insomnia, substance use, and self-harm/suicidal behavior as a result of quarantining and quarantining's impact on the livelihoods of individuals. Additionally, COVID-19 fears and concerns in conjunction with repeated exposure to drug-related overdose emergency situations that inherently encompass a degree of trauma (Goodison et al., 2019) could lead to short-term and/or long-term mental health complications over time. Previous findings on the effects of natural disasters (i.e., tornadoes, hurricanes, earthquakes) and human-caused disasters (i.e., industrial accidents, shootings, mass violence, acts of terrorism) have indicated short- and long-term increases in mental health problems (Holland et al., 2021; Substance Abuse and Mental Health Services, 2021). Considering the monumental events that occurred in 2020, including the emergence of COVID-19, the 2020 United States presidential election, various social justice issues, and the reliance on LEOs to manage these events, it is anticipated that LEOs' mental health will be at great risk.

Acute stress from witnessing or experiencing traumatic events may lead to chronic distress if not monitored and managed appropriately by LEOs (Marmar et al., 1999), and higher levels of depression and anxiety have been found in LEOs who were exposed to traumatic incidents (Hartley et al., 2007; Martin et al., 2009; Strahler & Ziegert, 2015). Consequently, self-destructive behaviors or negative coping strategies

may arise if LEOs ignore psychological trauma or other related mental health symptoms (Geronazzo-Alman et al., 2017; Menard & Arter, 2013; O'Hara et al., 2013). One must consider the implications of public health crises and the possible compromise of LEOs' safety, health, and well-being on and off the job. Physically and mentally healthy LEOs who are well equipped with PPE and naloxone are essential in maintaining law and order while battling both the opioid epidemic and the COVID-19 pandemic.

Attitudes About Addiction

Since ancient times, the progression of philosophy, religion, science, and medicine has challenged theorists' and professionals' hypotheses on the etiology of addiction (Robinson & Adinoff, 2016). Discourse about the etiology and nature of addiction has drastically evolved over the course of centuries as medical, political, and social sciences continue to examine the originating and maintaining factors of addiction. Evaluation of substance use and addiction from a research or treatment point of view innately elicits paradoxical and differing attitudes about addiction, as noted among professionals and laypersons worldwide (Luke et al., 2002). Although numerous hypotheses and models of addiction have been derived in attempts to conceptualize addiction, a dichotomy in causation of addiction from a moral or disease perspective remains as the two most commonly held viewpoints (White, 2000). Both models of addiction have undergone scrutiny for various reasons, thereby promoting further development of the moral model and disease model of addiction today. Furthermore, other models of addiction that appraise behavioral, psychosocial, biopsychosocial, or neurological factors have emerged in response to aspects that are not fully captured by the dichotomy of moral and disease models (Heather, 2017). As theories of addictive

behavior and motivation have been polarized between the moral and disease models for a majority of the 20th century and both models comprise the two most popular models of addiction, the disease and moral models solely are examined in this study (Bogren et al., 2019; Pickard et al., 2015).

The Moral Model

History

In the United States, the drug and alcohol culture has substantially transformed from the Colonial Era to today. The moral model is one of the primary frameworks through which addiction is conceptualized and understood by professionals and laypersons, and it was initially prominent throughout the 18th and early 19th centuries (Australian Government Department of Health, 2004). Religious, political, and medical influences, in conjunction with the increased availability of alcohol and tobacco, significantly contributed to the progression of substance use during the American Revolution and Young Republic era from 1763 to the 1820s (Lassiter & Spivey, 2018). Alcohol use was originally widely accepted because of its availability and utility for medical purposes; however, negative consequences of alcohol use, such as excessive use, violence, and death, gradually arose (Lassiter & Spivey, 2018). In 1826, the temperance movement began in response to excessive alcohol use throughout the United States and encouraged moderation so that alcohol use did not interfere with one's relationship with God (Thombs, 2006). Public acceptability of alcohol use in moderation then shifted to abstinence as clergy members preached that all alcohol use was immoral (Lassiter & Spivey, 2018). This religious movement laid the foundation for the moral model, which

dramatically influenced substance use policies and treatment, as well as attitudes of the general public throughout the first half of the 20th century (Pickard, 2017).

Assumptions of Moral Model

The moral model assumes that individuals addicted to substances refuse to adhere to ethical or moral codes of conduct and their behavior is freely chosen (Lassiter & Spivey, 2018). Also, individuals who excessively use substances or alcohol are considered morally weak, irresponsible, and sinful. As addiction is perceived as a choice, individuals are to blame for their actions, and substance use behaviors are deemed morally wrong (Lassiter & Spivey, 2018).

The Disease Model

History

In the late 18th century, the notion of addiction as a disease was first introduced by Benjamin Rush, a widely respected physician who is viewed as the father of American psychiatry (Gold & Adamec, 2011). In attempts to understand alcoholism from a medical perspective, he defined alcohol use as a “disease of the will,” which consequently contributed to the Temperance Movement in the 1820s (Levine, 1978). Although the moral model trumped the disease model for nearly a century, physicians in the 1880s and 1890s further examined the plausibility of addiction as a disease (Russell et al., 2011). In the United States and United Kingdom, conceptualization of addiction as a disease propelled medical interventions and treatment for individuals similar to those for other medical conditions (Russell et al., 2011). The simultaneous evolution of medicine, science, and substance use culture preserved the ideology of the disease model and attracted various professionals, politicians, and the general public.

In 1954, the American Medical Association classified alcoholism as a disease, thus significantly increasing the access and opportunity for individuals to receive effective treatment in the United States (Blume et al., 2013). Laws and policies congruent with the moral model were modified to reflect the disease model perspective, thereby allotting greater funds toward substance use treatment and research (Blume et al., 2013). As public funding increased in the mid 1990s, the disease model was further evaluated from a genetic and neurobiological framework (Institute of Medicine, 1997). A modern version of the disease model, which considers addiction as a brain disease, continues to be evaluated by researchers today (Kennett & McConnell, 2013).

Assumptions of Disease Model

The disease model is based on the premise that addiction is a physiological disease with an onset, course, and a specific set of symptoms, similar to a chronic medical condition (Blume et al., 2013). Some critical features overlap between substance use and many other chronic diseases, such as the lack of control over the condition and a strong tendency to relapse (Jaffe, 1995). According to the disease model, addiction is a primary, progressive, chronic relapsing disease that is either genetically transmitted or acquired through excessive consumption (Ketcham et al., 2000; Leshner, 1997). Initial substance use is deemed voluntary; however, after ongoing use of substances, alterations in neural and brain functioning transform voluntary use to compulsive use (Foulds & Ghodse, 1995; Ochoa, 1994). Addictive behavior is regarded as a compulsion and by definition reinforces the concept that behavior is outside of an individual's conscious control and disregards one's judgment to indulge in substance use behaviors or actual consumption of substances despite harmful consequences (Leshner, 1997; Lewis, 1993).

Evaluation of Moral and Disease Models

Benefits/Advantages of Moral Model

In comparison to other models of addiction, the moral model is direct and simplistic in both theory and treatment domains. The etiology of addiction is simple in nature because social, biological, psychological, or spiritual factors are not recognized (Lassiter & Spivey, 2018). In regard to treatment, punishment is considered a remedy to extinguish addictive behaviors because substance use and related behaviors are deemed wrong and sinful (Lassiter & Spivey, 2018). During the 18th and 19th centuries, punishment included public embarrassment, physical assault in the form of beatings and whippings, and fines. Incarceration and involuntary admission into psychiatric hospitals were also forms of punishment for substance use (Australian Government Department of Health, 2004). This form of treatment remained prominent via influence from governments and legal systems throughout the United States and Europe (Australian Government Department of Health, 2004) and continues today via policies and laws.

On the grounds that addiction is acknowledged as a choice, individuals struggling with substance use disorders have the opportunity to consciously choose to refrain from substances. With this understanding, individuals may gain a sense of control and autonomy, feel empowered, and view themselves as responsible to modify substance use behaviors. Essentially, the choice to refrain from substance use solely depends on the individual despite genetic, environmental, relational, physical, or mental health factors (Pickard, 2017). Epidemiological studies and behavioral intervention studies have supported the concept that substance use is a choice and can be controlled. Research findings indicate that a majority of individuals in their late 20s and 30s who once had a

pattern of substance use were able to reduce behaviors without clinical intervention as they transitioned to young adulthood. Roles and responsibilities inherent in young adulthood, including employment and parenthood, were identified as contributing factors to decrease in substance use (Foddy & Savulescu, 2006; Heyman, 2009; Peele, 1985; Pickard, 2012). In regard to control, some individuals with substance use disorders have deliberately decreased substance use to reduce tolerance effects, with the goal of decreasing cost of future drug use (Ainslie, 2000).

Behavioral interventions, such as contingency management treatment, have shown to improve rates of abstinence and treatment compliance by offering a reward system of incentives (Higgins & Petry, 1999; Higgins et al., 2007). Incentives, such as small prizes or monetary rewards, were awarded to those able to refrain from substance use and to provide negative urine drug screens and was found to be more effective than other modalities, such as CBT (Petry et al., 2011). Taken together, a significant amount of evidence indicates some degree of control and choice for those with substance use disorders across various situations, which aligns with the moral model of addiction. The moral perspective may consequently inform treatment approaches other than punishment, as individuals are considered responsible for their choices and controlling behaviors.

Criticisms of the Moral Model

One of the primary implications for those who endorse the moral model is that their attitudes and beliefs related to addiction essentially reduce the tolerance for and increase stigma toward individuals with substance use disorders (Caplehorn et al., 1996; James & Omoaregba, 2013; Luoma et al., 2007). Addiction stigma encompasses negative social attitudes toward individuals who use alcohol and/or other substances and

has proved to be stable, according to 10-year-long epidemiological surveys in the United States (Chartier et al., 2016; Pescosolido et al., 2010). Although both studies examined attitudes and beliefs during the late 1990s to mid 2000s, the consistency in belief systems signifies that the moral model remains prominent among the general public. It is proposed that addiction stigma will impede quality of care and use of treatment services and will serve as a barrier for substance users to acknowledge that their substance use behaviors are problematic (Grant et al., 2015; Grant et al., 2016; Volkow, 2008). As addiction research continues to flourish, the moral model has been refuted by scientific research findings because it does not consider addiction a complex multifaceted problem (Lassiter & Spivey, 2018). In regard to treatment from a moral model view, punishment has not resulted in lower prevalence/incidence rates of addiction. In fact, societal norms, prohibitions, and punishment via criminal justice systems have historically and predominantly exacerbated rates of organized crime, developed profitable yet dangerous underground markets, and inundated prisons (Lassiter & Spivey, 2018). Although the moral model treatment approach has dramatically transitioned from the 18th century to contemporary models of addiction treatment, policies and laws are still founded on the notion that addiction is a choice and can be controlled. LEOs are at the front line of maintaining order, which may influence their personal belief systems of addiction and endorsement of the moral model.

Benefits/Advantages of Disease Model

One of the primary strengths of the disease model is the nonstigmatizing approach to substance use and users (Frank & Nagel, 2017). An advantage of the disease model is that it acknowledges the involvement of biological processes that occur from initial and

ongoing substance use, which is critical to examine because of the complexity of pharmacokinetics of prescribed and illicit substances (Blume et al., 2013). Integration of biological processes in the conceptualization of addiction has challenged medical and behavioral health professions to identify and implement effective treatment strategies because addiction is considered comparable to other chronic medical conditions. Pharmaceutical interventions have also aligned with the disease model, evidenced by development of medications to treat symptoms and promote stabilization for those with myriad medical complications from substance use (Thombs & Osborn, 2019). These ramifications of the disease model continue to progress as researchers evaluate the efficacy of prevention, intervention, and relapse prevention methods. Overall, investment in the disease model from its infant stages has dramatically increased biomedical and clinical research related to substance use disorders, thus greatly contributing to the integrity of behavioral health professions (Substance Abuse and Mental Health Services Administration & Office of the Surgeon General, 2018).

The disease model has granted substance users an opportunity to receive quality, benevolent healthcare treatment, as well as increased access to treatment (Blume et al., 2013; Substance Abuse and Mental Health Services Administration & Office of the Surgeon General, 2018). Treatment grounded in the disease model of addiction has assisted countless individuals in recovery from substance use disorders (Thombs & Osborn, 2019). Furthermore, medical and clinical providers' conceptualization of addiction via the disease model may facilitate dialogue regarding biopsychosocial factors involved in a substance user's care. As the systematic coordination of general and behavioral healthcare continues to flourish in the United States, the disease model serves

as a platform for ongoing development of integrated healthcare and treatment of substance use disorders (National Council for Behavioral Health, 2020). Further examination and replication of treatment modalities based on the disease model could further inform treatment protocols at various organizational, legal, and systemic levels.

Criticisms of the Disease Model

A prominent critique of the disease model is that individuals with substance use disorders are deemed not responsible for or not in control of their substance use because of the biological and neurological implications (Blume et al., 2013; Frank & Nagel, 2017). This perspective could prevent individuals from developing and implementing self-management strategies and negatively influence a sense of self-efficacy in addressing substance use issues (Bilsker, 2003). Lack of self-efficacy may consequently influence an individual's desire to initiate behavioral change related to substance use and other areas of life (Kadden & Litt, 2011). Numerous studies have indicated a strong relationship between self-efficacy beliefs and substance use outcomes following a variety of treatment interventions (Dolan et al., 2008; McKay et al. 2004; Sitharthan & Kavanagh, 1990). Additionally, self-efficacy has been found to be associated with the occurrence or frequency of substance use (Allsop et al., 2000; Greenfield et al., 2000; Hayaki et al., 2011; Stephens et al., 1995). Taken together, the notion of lack of control and responsibility from a disease model perspective may negatively influence a substance user's acknowledgement, acceptance, and willingness to engage in treatment. Critics of the disease model have advocated further understanding of an individual's perspective of addiction and substance-related behaviors (Blume et al., 2013), possibly also providing insight into an individual's sense of self-efficacy.

In consideration of the substantial increase of research on treatment for substance use disorders from a disease model view, some researchers argue that biomedical treatments will dominate the scope of research on substance use disorders and neglect other essential areas addressing addiction (Hall et al., 2015). National public health organizations, such as the National Institute on Drug Abuse (2014), have notably prioritized research funds and allotted 16.5% to pharmacotherapies and 41.4% to basic and clinical neuroscience research from their 2014 research budget. Public health policies are at risk of being overlooked and underfunded because the standard of research is progressively shifting toward appraisal of biomedical interventions (Daniels, 2016; Hall et al., 2015). In the United States, implementation of public health policies have promoted powerful results and have shown to be more cost effective compared to research screenings of entire populations and interventions targeting a small sample of individuals at genetic risk of addiction (Hall et al., 2002).

Policies enforcing greater taxes on cigarettes, bans on advertisement of nicotine, and restrictions on smoking areas have halved the incidence of cigarette smoking during the past several decades (Forey et al., 2015; Pierce et al., 1998). Public health policies have also proved more efficient than drug vaccines, predictive genetic testing, or neurosurgical interventions targeting nicotine users and individuals at risk of smoking (Rose, 1992). Based on the success and validity of population level interventions, public health advocates present a valid argument against the primary focus of disease model research trending toward biomedical remedies. Conceptualization and policies devised to prevent and treat substance use disorders should by all means include biological and neurological factors; however, economic, epidemiological, and social scientific findings

indicate that neurobiology should not be the superior component when devising policies to address substance use (Hall et al., 2015). Addiction is a perplexing biological, psychological, and social condition that requires diverse clinical and public health approaches (Hall & Carter, 2012). As a society, understanding of the nature of addiction and the substance use culture continues to be challenging, as significant religious, philosophical, political, medical, and clinical influences are either in support of or against the disease and moral models of addiction.

LEOs' Perspectives of Substance Use and Substance Users

A significant amount of research has examined LEOs' perspectives on crime, policies related to crime, and how these factors influence police discretion, enforcement, and decision making (Alpert et al., 2004; Jorgensen, 2018; Schulenberg, 2015; Worden & McLean, 2014). In regard to specific crimes, limited studies address LEOs' perceptions of vice crimes, such as prostitution, gambling, and substance use (Jorgensen, 2018). Vice crimes are understood as behaviors that offend the general public's morals and sense of community, and LEOs who explicitly enforce laws against vice crimes are tasked with diversified responsibilities and duties (US Legal. (n.d.). Factors associated with and implications of LEOs' attitudes related to the actual vice behaviors are minimal, thus constituting a critical issue as 19.7 million individuals aged 12 years and older met criteria for a substance use disorder in 2017 (Beletsky et al., 2005; Beyer et al., 2002; Bose et al., 2018). The police occupational subculture depicts the general public as hostile, untrustworthy, and conceivably violent, an attitude that evokes secrecy, mutual support, and solidarity among LEOs (Westley, 1970). A potential reason for minimal research examining LEOs' attitudes related to enforcement of drug laws, substances of

abuse, and substance users may pertain to the various elements of police subculture and precautions of public examination (Petrocelli & Smith, 2000). One should note that the practices of LEOs, including their perspectives about matters related to occupational roles and encounters with the general public, are particularly confidential (Osborne, 2019).

Theories explaining police behavior have been considered to encompass two primary factors, police environment and individual characteristics (Crank, 1998). The police subculture influences LEOs' understanding of their environment, while individual characteristics of LEOs also assist in the discretion and action of LEOs. Individualism, being one's moral viewpoint, political philosophy, beliefs, or social outlook that emphasizes the moral worth of an individual, has been found to have a stronger impression on LEOs' decision making than police subculture (Luke 2020; Paoline et al., 2000). Addressing individual attributes of LEOs to better discern what stimulates their attitudes toward drug use is therefore an essential component in understanding behaviors. Owing to prior research indicating that LEOs' attitudes about crime and policy influence behaviors while on active duty (Gaines & Kappeler, 2005; Worden, 1989), the scope of crime must be narrowed to substance use and substance users. Furthermore, LEOs' impressions of substance users, overdose prevention, and response, particularly with individuals who engage in nonmedical prescription opioid use, remains underexamined in the research literature (Green et al., 2013; Osborne, 2019).

An exploratory study by Wilson et al. (1985) directly measured LEOs' attitudes toward victimless crimes in a small midwestern city within the United States. Perception of substance use ranged from heroin being most negatively viewed to marijuana as least rated (Wilson et al., 1985). Such findings were consistent with literature examining the

general public's perceptions of drug-related offenses and drug use (Cullen et al. 1982; Rossi et al., 1974). Although sample size and lack of generalizability were limitations, research findings by Wilson et al. (1985) nonetheless ignited curiosity in the criminology field (Jorgensen, 2018). Over the course of 35 years, subsequent research has reinforced the findings that LEOs are apt to have negative and punitive attitudes about drug use and drug users (Beyer et al., 2002; Jorgensen, 2018; Moore & Palmiotto, 1997; Petrocelli et al., 2014).

A more recent study revealed that LEOs throughout six different regions across the United States held personal beliefs that methamphetamines (38%) were the most harmful to individual substance users followed by heroin (22.5 %) and crack (11.1 %) (Petrocelli et al., 2014) in comparison to a wide range of substances. Cocaine, alcohol, ecstasy, marijuana, steroids, hallucinogens, prescription drugs, and other drugs were among the other substances LEOs ranked on a Likert scale as "not at all harmful" to "very harmful" (Petrocelli et al., 2014). Furthermore, variation was minimal in regard to belief of drug harm concerning methamphetamine, heroin, and crack, indicating that LEOs were in agreement on the detrimental impacts of substances to individual substance users across regions and departments ranging from municipal to federal levels (Petrocelli et al., 2014).

The several substances deemed most harmful by LEOs did fluctuate in ranking based on urban, suburban, or rural communities LEOs served. LEOs who served in urban areas perceived crack as most harmful in comparison to LEOs who served in rural or suburban areas, while suburban officers ranked heroin as most harmful, and rural officers ranked methamphetamines as most harmful in comparison to their counterparts

(Petrocelli et al., 2014). Judgement of harm in various communities is coherent with trends of reported drug use; for instance, crack use has historically been more prevalent in urban areas and methamphetamine use has notoriously been most prominent in rural areas (Van Gundy, 2006). Furthermore, more than 90% of LEOs affirmed that crack, heroin, and methamphetamines are “very harmful” or harmful” to the nation, followed by hallucinogens and ecstasy (Petrocelli et al., 2014). Marijuana was deemed the substance to cause the least degree of national harm, a belief that could perhaps be related to progression of marijuana laws, policies, and the general public’s stance on marijuana use.

Attitudes on drugs and drug use evidently vary among LEOs and the general public, and past findings have suggested that attitudes of the general public are influenced by numerous domains, primarily religion, politics, and culture (Kalant, 2010; Stylianou, 2003). With reference to substance use culture in the United States, great differences in attitudes toward vice behaviors, including substance use, have been found across state levels (Clement & Barbrey, 2008). These findings feature how perceptions of substance use can diverge from community, state, and nationwide levels; nonetheless, perceptions of LEOs and the general public represent a coherent view within each level. From a national level, evaluation of harm for substance users and communities is outlined via drug schedules by the United States Drug Enforcement Administration, which is in part influenced by political attitudes and beliefs (Kalant, 2010). Owing to the personal, cultural, societal, and political factors that shape and influence LEOs’ perceptions of substance use and users, additional research must further examine this subject matter.

LEOs and Enforcement

In response to changes in the societal and political realms, revisions to the mission, roles, responsibilities, and structure of police departments in the United States also followed (Lundman, 1980). Enforcement of laws by LEOs has been extensively investigated, as drastic changes have been made to types of policing in the United States since its inception in the early to mid 1800s to present (Pierce, 1987). Several components have been suggested to inform the enforcement practices of LEOs, including (a) policing strategies, such as problem-oriented policing, community-oriented policing, “broken windows,” “stop and frisk,” and third-party policing; (b) organizational characteristics (Chappell et al., 2006); and (c) discretion (Walker, 1993).

A majority of past research on police behavior has used observational methodology to examine how LEOs conduct themselves during encounters with the general public (Alpert et al., 2004). Although observational methods may be considered advantageous in evaluating LEOs’ behaviors, the Hawthorne effect may be a significant limitation because LEOs may modify their behaviors or reactions because they are aware of being observed. Enforcement of laws by LEOs must remain under investigation because LEOs’ judgement of whether to enforce a law and to what degree has drastic ramifications at individual, societal, and systematic levels. In regard to illicit substances, historic street-level enforcement strategies remain the most prominent intervention for LEOs (Kerr et al., 2005).

Research findings have indicated that LEOs’ attitudes are crucial to consider in regard to enforcement of criminal justice policies (Petrocelli et al., 2014). LEOs’ attitudes about laws and systematic implementation of laws have proved to be a

significant factor in areas of crime, both violent and nonviolent (Alpert et al., 2004; Sun, 2003). Practically, enforcement of drug-related laws would be considered no different from those of other areas of crime and could consequently influence LEOs' discretion of enforcement. Evidence further suggests that LEOs' perceptions and attitudes toward suspects and type of crime are two components that influence LEOs' discretion and enforcement of laws (Gaines & Kappeler, 2005; Worden, 1989). LEOs' attitudes with respect to use of force in hypothetical scenarios were examined across urban, suburban, and rural police departments in New Jersey (Barrett et al., 2009). Findings revealed a geographic and demographic influence on the officers' responses to the scenarios.

Urban LEOs were more pragmatic in their discretion to use force, and in a hypothetical scenario of two men possibly smoking marijuana in a car, LEOs considered how busy their shift was, took into account past encounters with citizens, and reported decreased likelihood of stopping two men possibly smoking marijuana in a car. Urban LEOs noted they would further investigate if they were unfamiliar with citizens involved in the scenario (Barrett et al., 2009). Conversely, rural officers were considered more legalistic and technically precise in application of force. All suburban and rural officers determined they would stop and investigate the scenario by interviewing the two men, searching the vehicle, and potentially arresting the individuals (Barrett et al., 2009). Level of education was also another factor identified as potentially influential in LEOs' attitudes toward the use of force, being as suburban and rural officers had more formal education than urban LEOs. Being that a LEOs' perception of degree of harm of a substance varied across geographic locations (Petrocelli et al., 2014), one could logically

assume that LEOs' discretion of enforcement would also be influenced by their attitudes toward substances, substance users, and evaluation of harm.

LEOs favored legal interventions (i.e., fines and probation, imprisonment) for selling drugs, including heroin, cocaine, and marijuana. Support for legal interventions was most prominent for heroin, followed by cocaine and marijuana (Wilson et al., 1985). Additionally, marijuana was the only drug-related offense for which a majority (52.3%) of the LEOs did not advocate imprisonment (Wilson et al., 1985). LEOs preferred more stringent legal interventions for individuals selling drugs compared to those using drugs, perhaps reflecting emerging policies related to the War on Drugs in 1985 (Drug Policy Alliance, 2021). Nearly 3 decades later, research findings demonstrated that 45.2% of LEOs who participated in the study supported incarceration of substance users, sellers, and manufacturers as a means of addressing addiction in the United States (Osborne, 2019; Petrocelli et al., 2014). LEOs held strict disciplinary views for both substance users and dealers; 58.7 % of LEOs identified legal interventions as the most productive enforcement strategy (Petrocelli et al., 2014).

These findings were consistently reported by LEOs across the six different regions of the United States (Petrocelli et al., 2014). In 2018, Jorgensen found that LEOs' preferred intervention for those convicted of selling heroin and cocaine was incarceration, whereas LEOs felt minimal time in jail was appropriate for individuals convicted of selling marijuana. Taken together, findings suggest that LEOs favored means of enforcement for substance users, dealers, and manufacturers aligned specifically with the moral model of addiction rather than the disease model. Despite the considerable advancement in drug enforcement policies shifting from the War on Drugs

to harm reduction, LEOs' attitudes and beliefs remain rather consistent, as evidenced by research findings from 1985 to as recently as 2018. Furthermore, LEOs' attitudes toward specific substances also appear to influence LEOs' discretion to intervene, as well as degree of enforcement. One should consider how location (i.e., rural, suburban, and urban) influences both attitudes about substances and enforcement. LEOs' judgement and decision-making abilities derived from perceptions of substance use and users carry significant magnitude, as they can significantly impact an individual's life (Johnson & Lafrance, 2016).

Taken together, the current opioid epidemic and emergence of COVID-19 have undoubtedly affected the nation across various public health domains, as well as economic and social systems. LEOs are among the many groups who have been called upon to assist in the battle against both public health crises and are deemed interictal catalysts in minimizing danger and harm for Americans. Advancement of laws and policies that promote LEOs' active participation in naloxone administration is being regularly implemented across the United States, with some rebuke from criminal justice systems and the general public. One must consider the influence of LEOs' attitudes and knowledge on the likelihood of naloxone administration because law enforcement roles and responsibilities continue to mature. This study contributes to the current literature by determining whether differences in LEOs' subscription to models of addiction and knowledge of opioid overdose and naloxone influence the likelihood of naloxone administration. Additionally, this study broaches the potential impact of LEOs' fears regarding COVID-19 and their consequent actions surrounding naloxone administration. To date, limited research exists on how individual LEOs will respond to opioid overdose

scenarios, thus begging the practicality of understanding the factors that contribute to LEOs' discretion of naloxone administration.

CHAPTER 3: METHOD

Research Design

The main purpose of the present study is to examine the association between law enforcement officers' (LEOs') attitudes and knowledge and administration of naloxone to reverse opioid overdose. A secondary purpose of the study is to understand how LEOs' degree of concern over contracting Coronavirus (COVID-19) may impact the likelihood of naloxone administration. The study used a nonexperimental exploratory vignette design. The correlational study used an anonymous survey of LEOs to examine the relationship between their belief in the disease model of addiction, degree of knowledge regarding opioid overdose and naloxone administration, and degree of concern over contracting COVID-19 on their likelihood of administering naloxone.

Participants

Recruitment

This study used a convenience sample. Participants were recruited via snowball sampling, mass e-mail thread, paper flyers, and social media (i.e., Facebook). One hundred and twenty-five LEOs were initially identified as a preferred sample size. The number of individuals interested in participating in the study exceeded the researchers' expectations. The researchers submitted an addendum to the Institutional Review Board to ensure compliance and adherence to rules/regulations.

The recruitment process began by consulting with peers who were active and inactive LEOs, as well as with family members of LEOs. Consultations were not limited to LEOs from the Philadelphia Police Department and extended to other LEOs in surrounding townships and states. These consultations provided the researcher with

valuable information on effectively and efficiently enlisting LEOs. The researcher also contacted the Office of Media Relations and personnel from the Advanced Training Unit within the Philadelphia Police Department to inquire about the potential opportunity for the study advertisement to be sent via mass e-mail thread.

The e-mail advertisement was drafted by the researcher and reviewed by the dissertation chair prior to being submitted to Advanced Training Unit personnel, specifically Lieutenant Gallagher, who was responsible for the naloxone training program in the Philadelphia Police Department. Approval to send to all police districts was denied, so several police districts were able to send e-mail within their respective locations.

The examiner recruited participants via use of mass e-mail thread and paper flyers to police districts within the Philadelphia Police (Appendix A). Paper flyers included a unique QR code so that participants could complete the survey via use of a cellular phone, if desired. Social media was also used, and the examiner used their personal Facebook account to advertise participation for study via posting on the examiner's Facebook webpage. Advertisement consisted of a brief description of inclusion criteria. Participants had the opportunity to click on the REDCap link included in the advertisements via Facebook postings and e-mail advertisements to complete the survey.

Inclusion Criteria

Eligible participants included active LEOs from any of the 21 police districts in the city of Philadelphia. Eligible participants included men and women between the ages of 22 to 70 years who ranked as a police officer or higher. Per the Philadelphia Police Department, prospective police recruits must have been at least 22 years old upon the date of appointment, which is the date an individual enters the Police Academy for

Training (Philadelphia Police Department, 2015). All eligible participants must have received naloxone training by the Philadelphia Police Department during or after 2015, as the Philadelphia Police Department implemented a Naloxone Administration Program policy in February 2015 (Philadelphia Police Department, 2015). All eligible participants must have been fluent in reading English to ensure they understood the entirety of the informed consent and measures.

Exclusion Criteria

LEOs who were no longer active duty in the Philadelphia Police District were ineligible to participate in this study. Participants who did not complete the 30-week training program, start the job on a probationary period, or were outside of the age range of 22 to 70 years old were excluded. LEOs who did not receive naloxone training from the Philadelphia Police Department during or after 2015 and were not fluent in reading English were excluded.

Screening

Following an invitation via social media or web link to participate in the study, participants were screened upon clicking a REDCap web-link (Appendix B). Participants were required to complete a brief screener to qualify to participate in the study. The brief screener included questions related to age, length of employment in the Philadelphia Police Department, naloxone training during or after 2015, status of duty in the Philadelphia Police Department (i.e., active or inactive), and ability to read English fluently. Anyone failing to meet the inclusion criteria was not included in the study and was directed to an exit screen that thanked them for their interest and informed them that they did not qualify to participate in the study.

Measures

Demographic Questionnaire

Participants were provided with a questionnaire to obtain specific demographic information. LEOs were asked questions on gender; race; highest degree or level of education; total years of employment as a LEO (including Philadelphia Police Department and others); current assigned police district, unit, or office; number of opioid overdose individuals encountered while on duty; and number of times administered naloxone (excluding trainings).

Addiction Belief Inventory (ABI)

This study used the ABI (Luke et al., 2002) to examine to what degree LEOs endorse a disease model of addiction. The ABI is a 30-item self-report measure of personal beliefs about addiction and substance use issues. This instrument has been used in studies across various populations, such as individuals who use substances, staff of substance use treatment centers, and the general population (Luke et al., 2002). The ABI consists of seven subscales, and each subscale represents different addiction beliefs. A combination of these subscales reflects global belief models about addiction, ranging from the disease model, 12-step model, and psychosocial model to the moral weakness model. The creators of the ABI argue that different constellations of these beliefs can be formed into the broader addiction models, such as the disease model. Each subscale contains between three to five items, and each item is rated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate higher believability while lower scores indicate lower believability in each subscale (Luke et al.,

2002). Consequently, higher scores are associated with a disease model ideology, while lower scores are associated with a more psychosocial ideology.

The ABI has demonstrated reliability, specifically internal consistency and test-retest reliability. In regard to internal consistency, five of seven subscales (Inability to Control; Chronic Disease; Reliance on Experts; Responsibility for Recovery; Coping) had an alpha of .70, while remaining subscales (Responsibilities for Actions and Genetic Basis) fell between a .6 to .7 alpha range (Luke et al., 2002). The Moral Weakness subscale, which is composed of five items, had poor internal consistency (.63 and .68) in both samples (dual diagnosis samples and alcohol sample) and therefore was not included in the ABI. The items derived from the Moral Weakness subscale remain on the ABI for future researchers interested in examining that specific construct because the moral model is a prominent model within the addiction literature (Rise & Halkjelsvik, 2019).

Opioid Overdose Knowledge Scale (OOKS)

This study used the OOKS to examine a LEO's degree of knowledge as it relates to opioid overdose and naloxone administration. The OOKS is a 45-item self-report measure designed to assess the level of knowledge of opioid overdose management. The OOKS was initially developed as an outcome measure to evaluate take-home naloxone training for peers and family members of opioid users (Williams et al., 2013). It has since been used across differing populations, including addiction professionals and substance users (Williams et al., 2013). The OOKS has scores on four domains: risk (i.e., risk factors for an overdose), signs (i.e., signs of an overdose), action (i.e., actions to be taken at an overdose), and naloxone use (i.e., naloxone effects, administration, and aftercare procedures; Williams et al., 2014).

From the total 45 items, the OOKS includes four multiple-choice questions, four forced-choice questions, and six true/false statements. Depending on the OOKS item, the participant may choose from a “yes/no or don’t know” or “true/false or don’t know” response format. Each correct answer is scored as 1 point, while “don’t know” and incorrect responses are scored as zero points (Williams et al., 2013). The total OOKS score ranges from 0-45 points, and a higher score on the OOKS indicates a higher degree of knowledge of opioid overdose management. The OOKS has demonstrated to be internally reliable (alpha coefficient 0.83), and the total score for the OOKS has a high level of test–retest reliability (ICC = 0.90). The domain’s reliability scores (ICC) fell in the fair-to-excellent range and are as follow: risks 0.87, signs 0.69, actions 0.53, and naloxone use 0.83. The scale has also been proved to have face, content, and construct validity (Williams et al., 2014).

Opioid Overdose Vignette

Participants were presented with one vignette (Appendix C). The vignette described a scene in which an individual is experiencing an opioid overdose while the LEO is on active duty. The scene is described in detail as if the participant were experiencing the situation, including specific terminology typically used by LEOs. In developing the vignette, the researcher considered the demographic variables, including age and gender of individuals who have demonstrated the highest rates of naloxone administration in Philadelphia from emergency medical service (EMS) providers in 2019 and hospitalizations attributable to opioid poisoning in 2018 (The Department of Public Health: City of Philadelphia, 2020). In preparation for this study, three active LEOs were asked to review the vignette to determine its level of realism. The three LEOs were e-

mailed a Word document of the vignette along with the following question: “On a scale of 1-5, (1 being not realistic at all; 5 being very realistic), how realistic is this scenario?” The LEOs were also given an opportunity to provide additional feedback/comments on the scenario. All three raters scored the vignette as “very realistic.” The feedback provided by the three raters was incorporated into the vignette; specifically, the researcher added the brand name of naloxone (Narcan) and added the quantity of naloxone kits in the squad car. In regard to realism, Rater 2 stated, “That's pretty much all the information we get when we're dispatched to overdose situations by radio.” In response to the raters’ suggestions and overall feedback, the final vignette was developed.

Post- vignette Questions

Participants were provided with a brief questionnaire (Appendix C) that consisted of a minimum of four items (i.e., Items 1, 2, 4, and 5) or a maximum of seven items (i.e., all items), depending on the participant’s response on Item 2 and Item 5. Items 1 and 2 assessed the likelihood the participant would administer naloxone based on the vignette. A 5-point Likert scale (continuous) was used to measure the participants' responses. The participant chose from the following response options: (1) Very Unlikely, (2) Not Likely, (3) Somewhat Likely, (4) Likely, (5) Very Likely. If the participant endorsed a “3,” “4,” or “5,” on Item 2, REDCap populated one additional item, (i.e., Item 3). Item 3 inquired about the participant’s reason(s) for waiting for the fire department to administer naloxone. The participant was then prompted to insert a text response via RedCap text boxes. If the participant endorsed a “1” or “2” on Item 2, the participant was prompted to answer Item 4.

On Item 4, the participant was asked to identify any characteristics of the opioid overdose individual or situation that might impact their willingness to administer naloxone. The participant was prompted to insert a text response to Item 4 via RedCap text boxes. Item 5 assessed the participant's degree of concern about contracting Coronavirus (COVID-19) while administering naloxone. A 5-point Likert scale (continuous) was used to measure the participant's response; the participant chose from the following response options: (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly agree. If the participant endorsed a "1," "2," or "3," RedCap ended the post vignette questionnaire following completion of Item 5. If the participant endorsed a "4" or "5" on Item 5, REDCap populated two additional items (i.e., Items 6 and 7). The two additional items inquired about the participant's specific concerns related to contracting COVID-19 and allowed the participant to insert a text response via RedCap text boxes. The participant's responses from Items 3, 4, 6, and 7 were organized and categorized into themes.

The participant was exposed to the following items in order:

Item 1: Based on the scenario you just read, how likely would you be to administer naloxone (Narcan) to the individual experiencing an opioid overdose?

Item 2: Based on the scenario you just read, how likely would you be to wait for the fire department to administer naloxone (Narcan) to the individual experiencing an opioid overdose?

Item 3: What is/are the reason(s) you would wait?

Item 4: What characteristics, if any, of the individual or situation might impact your willingness to administer naloxone?

Item 5: I am concerned about contracting Coronavirus (COVID-19) while administering naloxone (Narcan).

Item 6: What part(s) of the administration process are you most concerned about?

Item 7: What concerns you most about contracting COVID-19?

Procedures

The researcher recruited Philadelphia LEOs via use of social media, mass e-mail thread, and paper flyers. The advertisement included a brief description of eligibility and the purpose of the study as it regards improving naloxone training within the Philadelphia Police Department. Interested individuals began the online survey by either clicking the REDCap link included within the e-mail or posting on social media. On the paper flyers, interested individuals had the option to either scan the QR code or type the web-link information via online web browser (i.e.,, Google Chrome, Safari, Internet Explorer, Mozilla Firefox, or Microsoft Edge). The participant's clicking on or typing in the REDCap weblink served as consent to participate in the study.

After opening the REDCap link, the participant completed the brief screener, and if deemed eligible, the participant then had access to the remaining web pages: (a) Demographic Questionnaire; (b) Vignette; (c) Post Vignette Questionnaire; and (d) ABI and OOKS. Upon completion of the study, participants were thanked for their participation and offered the opportunity to click a web link that allowed them to enter their information to participate in a drawing for one of six \$25 Visa gift cards. Participants were made aware that in order to preserve anonymity, their contact information would not be connected to their survey information.

Following the collection of all surveys, the researcher used a random digit generator and then sorted by this digit six times to randomly select the winners. The researcher individually e-mailed the six winning raffle participants a web link to claim the \$25 Visa gift card. The web link prompted the raffle winner to register and activate the Virtual Visa eGift Card via an activation code. The researcher collected the raw data via REDCap report and the data was password protected by the examiner. REDCap data were then entered into the SPSS dataset, and analyses were computed using deidentified coding procedures. All datasets and reports were password protected and maintained on a password-protected laptop by the researcher.

Qualitative data derived from post vignette items 3, 4, 6, and 7 were reviewed, organized, and combined into categories by the researcher.

CHAPTER 4: RESULTS

Analyses

Power Analysis

A power analysis was conducted to determine the minimum number of participants necessary to examine the primary hypothesis. Assuming a small-to-medium effect size of 0.10 and an alpha of 0.05, a sample size of 262 was estimated to be necessary to achieve a statistical power of 0.80 (Cohen, 1992). All information was collected via REDCap and entered into SPSS for analysis.

Item Analyses

After discussions with the dissertation chair, a coauthor of the Addiction Belief Inventory (ABI), and through discussion with peers in the field, the ABI was not used in its entirety. Owing to the focus on capturing a disease model of addiction and poor—to-moderate internal consistency across specific ABI subscales (Luke et al., 2002), seven items across four of the eight subscales were included and represented the ABI in the bivariate correlations and regression analyses. Following selection of the seven ABI items (i.e., Items 5-8, 11, 13, 19), the items were analyzed via SPSS to determine internal consistency of the chosen items. A Cronbach's Alpha and Cronbach's Alpha Based on Standardized Items were conducted and appeared to have suitable inter-item correlations of alpha (.755 and .757, respectively). Because a Cronbach's alpha of .70 is considered “good” (Taber, 2018), the seven items were included in the analyses and were representative of the ABI as one of the hypothesized independent variables.

Demographic Analyses

Descriptive statistics were calculated for the entire sample, including means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Characteristics collected included age; gender; race; highest degree or level of education; total years of employment as a law enforcement officer (LEO), including Philadelphia Police Department and others; current assigned police district, unit, or office; number of opioid overdose individuals encountered while on duty; and number of times administered naloxone (excluding trainings).

Participant Sample

A total of 327 individuals entered the survey. Of the 327 people, 229 (70.03%) met inclusion criteria. A total of 98 (29.97%) individuals were excluded from the study for the following reasons: age, length of employment, did not receive naloxone training during or after 2015, and employment status. Some individuals met all inclusion criteria; however, they did not complete the survey in its entirety. From the cumulative total of 98 excluded respondents, 71 (21.7%) did not meet inclusion criteria; two (0.6%) were 21 years old or younger, five (1.5%) were employed fewer than 8 months, 11 (3.4 %) did not complete naloxone training during or after 2015, and one (0.3%) did not read English fluently. In regard to employment status, a total of 56 (17.1%) were excluded: 36 (11%) worked part-time, 15 (4.6%) were employed by another police department, four (1.2%) were currently unemployed, and one (.3%) was retired. A total of 27 (8.3%) respondents met inclusion criteria; however, they did not complete the survey.

Participant Characteristics

A total of 229 participants met all inclusion criteria and completed the entire survey and, therefore, were included in the final analyses. Participants' ages ranged from 22 years old to 60 years old, with a mean age of 30.57 years ($SD = 5.82$ years; see Table 1). Of these participants, 159 (69.4%) identified as male, and 70 (30.6%) identified as female. The majority of participants, 176 (76.9%), identified themselves as White/Caucasian, 25 (10.9 %) identified as Hispanic/Latino, 19 (8.3 %) identified as Black/African American, 5 (2.2 %) identified as Asian/Pacific Islander, and 4 (1.7 %) described themselves Multiracial/Biracial.

The highest level of education completed by respondents ranged from some high school, no diploma, to doctorate degree. A bachelor's degree was the most common level of education completed, including 75 individuals (32.8%), followed by some college credit, no degree (54, 23.6%), high-school graduate, diploma or GED (30, 13.1%), associate's degree (27, 11.8%), trade/technical/vocational training (14, 6.1%), master's degree (14, 6.1%), some high school, no diploma (8, 3.5%), and doctorate degree (7, 3.1%).

The average number of years as a LEO, including in both Philadelphia Police Department and other police departments, was 6.04 years ($SD = 4.11$), ranging from 1 year to 35 years. A majority of respondents endorsed 3 to 6 years of employment as a LEO (126, 55%). Of the 21 police districts in the Philadelphia Police Department, all 21 districts were represented in the sample and accounted for 222 (97%) of the respondents. Active assignments to police special units within the Philadelphia Police Department, including the Delaware Valley Intelligence Center, Mounted Unit, Police Marine Unit, and Civil Affairs Unit, were endorsed by seven (3%) respondents

The number of reported opioid overdose encounters while on duty ranged from 0 to 100 encounters, with a mean of 15.69 ($SD = 24.52$). Approximately 83 (36%) of respondents encountered three to six opioid overdoses while on duty, while four opioid overdose encounters were most endorsed by 24 (10.5%) respondents. Lastly, the number of times respondents administered naloxone ranged from 0 times to 50 times, with an average of 5.32 times ($SD = 6.19$) throughout their career as a LEO, excluding training. Overall, approximately 203 (89%) respondents administered naloxone at least once, and 92 (40%) respondents administered naloxone at least five times or more throughout their careers as LEOs.

Table 1*Demographic Variables Descriptive Statistics*

Variable	<i>M (SD)</i>	<i>N (%)</i>
Age	30.57 (5.82)	
Gender		
Male	159 (69.4)	69.43231
Female	70 (30.6)	30.56769
Race/Ethnicity		
White or Caucasian		176 (76.9)
Black or African American		19 (8.3)
Hispanic or Latino		25 (10.9)
Asian or Pacific Islander		5 (2.2)
Multiracial or Biracial		4 (1.7)
Highest Degree/Level of Education		
Some high school, no diploma		8 (3.5)
High school graduate, diploma, GED		30 (13.1)
Some college credit, no degree		54 (23.6)
Trade/technical/vocational training		14 (6.1)
Associate degree		27 (11.8)
Bachelor's degree		75 (32.8)
Master's degree		14 (6.1)
Doctorate degree		7 (3.1)
Total years of employment as a Law Enforcement Officer	6.04 (4.11)	
Current Assignment in the Philadelphia Police Department		
Police District		222 (97)
Police Special Unit		7 (3)
Number of opioid overdose individuals encountered while on duty	15.69 (24.52)	
Number of times administered naloxone (excluding trainings)	5.32 (6.19)	

Outcome Measures

Correlations

Bivariate correlations were conducted to examine the associations between the dependent variable (DV; naloxone administration), the hypothesized independent variables (IVs), and demographic variables (Table 2). Significant associations were identified between the likelihood of naloxone administration (DV) and knowledge of opioid overdose ($r = .406, p = 0.01$), and concern of contracting COVID-19 ($r = .203, p = 0.01$), and waiting for assistance from the fire department ($r = .341, p = 0.01$). Although waiting for assistance from the fire department was significantly correlated with likelihood of naloxone administration (DV), the item was not included in the linear regression model. After thorough consideration with my chair and other colleagues, all agreed that the item, “Based on the scenario you just read, how likely would you be to wait for the fire department to administer naloxone (Narcan) to the individual experiencing an opioid overdose?” may have been misinterpreted. The item may have implied that the respondent would still intend to administer naloxone but would wait for the fire department to ensure adequate oversight. Although statistically significant correlations were found between IVs, the correlations were not strong enough to signal multicollinearity, and the linear regression was run without eliminating any IVs.

Significant associations were also found between knowledge of opioid overdose and number of opioid overdoses encountered while on duty ($r = .396, p = 0.01$), and years in the Philadelphia Police Department ($r = .158, p = 0.05$), and waiting for assistance from the fire department ($r = -.159, p = 0.05$). Additionally, years in the

Philadelphia Police Department was significantly associated with the number of opioid overdose encounters while on duty ($r = .382, p = 0.01$), while years in the Philadelphia Police Department bordered on significance with degree of belief in the disease model ($r = -.166, p = 0.05$).

Table 2

Correlational Matrix of Demographic and Outcome Variable: Naloxone Administration

Variable	Naloxone administration	Disease Model (ABI)	Knowledge (OOKS)	COVID-19 Concerns	Wait for Assistance	Yrs in PPD	Highest Education Level	OD Encounters
Naloxone administration	1.00							
Disease Model (ABI)	.20	1.00						
Knowledge (OOKS)	.406**	-.158*	1.00					
COVID-19 Concerns	.203**	.234**	-.067	1.00				
Wait for Assistance	.341**	.240**	-.159*	.488*	1.00			
Yrs in PPD	.056	-.166*	.158*	.026	-.017	1.00		
Highest Education Level	.027	.140*	-.085	.121	.142*	-.092	1.00	
OD Encounters	.089	-.160*	.396**	.038	.073	.382**	-.100	1.00

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

Linear Regression

Assumptions associated with linear regression, including normality, homoscedasticity, and multicollinearity, were evaluated prior to analyses. The normality assumption was evaluated using the Shapiro-Wilks test and histograms. A plot of standardized residuals versus predicted value was used to determine homoscedasticity. Lastly, multicollinearity was tested by examining bivariate correlations between all IVs. None of the assumptions were violated, and therefore, all identified variables were entered into a single linear regression model.

A linear regression was used to evaluate the relationship between LEOs' degrees of belief in the disease model (Hypothesis 1); degree of knowledge on opioid overdose and naloxone administration (Hypothesis 2); degree of concern of contracting COVID-19 (Hypothesis 3), and their likelihood of administering naloxone based on the vignette of an opioid overdose encounter. Each of the three IVs was entered into a single linear regression model to examine the influence of LEOs' likelihood of administering naloxone.

Hypothesis 1

It was hypothesized that LEOs' degrees of belief in the disease model as measured by the Addiction Belief Inventory (ABI) would be significantly and positively associated with naloxone administration. As discussed earlier, bivariate correlations found no instances of multicollinearity or other variables that were correlated with the DV. The regression model including all three IVs on the single DV (as displayed in Table 3) were entered into the model summary. The overall regression model was found to be significant, $F(3,225) = 21.094, p < .001$. The model explained approximately 22% of the variance in the likelihood of administering naloxone (r square = .22). Examination of the

coefficients, however, indicated that the ABI was not a significant predictor of likelihood of administering naloxone ($p = .56$), which revealed that Hypothesis 1 was not supported.

Hypothesis 2

It was hypothesized that LEOs' degrees of knowledge regarding opioid overdose and naloxone administration as measured by the Opioid Overdose Knowledge Scale (OOKS) would be significantly and positively associated with naloxone administration. As discussed previously, opioid overdose knowledge was included in the regression model. The overall model was significant and accounted for 22% of the variance in the likelihood of administering naloxone. Findings supported the hypothesis, with coefficients, indicating that knowledge score on the OOKS was a significant predictor of naloxone administration ($p < .001$).

Hypothesis 3

It was hypothesized that LEOs' degrees of concern of contracting Coronavirus (COVID-19) would be significantly and negatively associated with naloxone administration. Concerns of contracting COVID-19 was included in the regression model. The overall model was significant and accounted for 22% of the variance in the likelihood of administering naloxone. However, contrary to the hypothesis, the correlation coefficients revealed a significant and positive association between concerns of contracting COVID-19 and likelihood of administering naloxone. Findings indicated that concern of contracting COVID-19 was a significant predictor of naloxone administration ($p = .000$).

Table 3*Linear Regression Predicting Likelihood to Administer Naloxone*

	Unstandardized coefficients		Standardized coefficients		Sig.
	<i>B</i>	Std. Error	Beta	<i>t</i>	
Model (<i>N</i> = 229)					
(Constant)	-.344	.595		-.579	.563
ABI items 5-8, 11,13,19	.073	.125	.036	.581	.562
OOKS	.097	.013	.427	7.156	.000
Item 5: I am concerned about contracting COVID-19 while administering naloxone	.310	.084	.223	3.681	.000

Open-ended Responses

Rather than using a specific qualitative analysis method, responses to open-ended questions on Items 3, 4, 6, and 7 were organized and categorized into themes. Items 3 and 4 were categorized by the following: Individual Characteristics, Situational Characteristics, Logistical Factors, and Personal Factors (see Table 4). While waiting for fire department /rescue/ medical personnel was the most endorsed reason for waiting, the second most common response was noteworthy; LEOs' preference either to do sternum rubs or to verbally inform the individual that they are going to administer naloxone. Apparently, LEOs have been trained on several ways to intervene and respond to individuals overdosing from opioids.

Parts of the administration process LEOs were most concerned about (Item 6) included the individual coughing or sneezing on the LEO after administering naloxone, physical contact with opioid overdose individual, and continued exposure to COVID-19-positive individuals with limited personal protective equipment (PPE). Regarding primary concerns about contracting COVID-19 (Item 7), LEOs identified the following:

rates of infection of COVID-19; contagiousness; personal health concerns; bringing COVID-19 home to family; and inability to perform daily activities.

Table 4

Open-Ended Responses (Items 3 and 4)

Themes	Item 3 ^a	Item 4 ^b
Individual characteristics	Male is breathing	Signs and symptoms of OD
	Ambiguity about symptoms related to an OD or other medical issue	Other medical condition
	Unclear about length of time since substances were taken	
Situational characteristics	Wait for fire department /rescue/ medical personnel	Hypodermic needle
	Protect the scene & safety of others	Medics/Fire Department on the way
	Prioritization of radio call volume	Witnesses present
Logistical factors	Use of other interventions prior to administering naloxone	Type of naloxone available (nasal vs intramuscular/intravenous)
		Side effects of naloxone
		Accessibility to naloxone
Personal factors	No medical qualifications	Use for self or partner in the event of airborne exposure
	Concerned about mishandling the situation	Physical health condition

^a What is/are the reason(s) you would wait?

^b What characteristics, if any, might impact your willingness to administer naloxone?

CHAPTER 5: DISCUSSION

Interpretation and Implications

Interpretation

Based on the current research findings, degree of knowledge and concerns about contracting COVID were two variables that had a significant impact on the likelihood that a law enforcement officer (LEO) would administer naloxone to an individual overdosing on opioids. The significant and positive association found in Hypothesis 2 suggests that LEOs who had greater degrees of knowledge about opioid overdose, including risk factors for an overdose, signs of an overdose, actions to be taken at an overdose, naloxone effects, and administration and aftercare procedures, were more likely than LEOs with less knowledge to administer naloxone. This significant and positive association indicates that the greater understanding and awareness about opioid overdose risk, signs, action, and naloxone use that one has, the more likely one will administer naloxone.

Current findings are consistent with research literature on the effects of brief naloxone training for the public, including increases in knowledge on how to respond to overdose situations, perceived confidence in responding, and willingness to perform recommended procedures (Bennett & Holloway, 2012; Green et al., 2008; Lewis et al., 2016; Maxwell et al., 2006; McAuley et al., 2010). A longitudinal analysis involving 228 Howard County Police Department LEOs examined their naloxone-training knowledge retention over 30-day and 6-month periods (Nath et al., 2020). LEOs performed marginally better on the 6-month survey than on the 30-day survey, specifically on identification of signs and symptoms of an opioid overdose, correct identification of opioid versus nonopioid drugs, and length of time for intranasal naloxone to take effect

(Nath et al., 2020). Naloxone trainings have been demonstrated to positively influence degree of knowledge in both the short and long term (Behar et al., 2015; Dahlem et al., 2017; Nath et al., 2020; Purviance et al., 2017; Saucier et al., 2016; Wagner et al., 2016).

Although a negative association between concerns of contracting COVID-19 and likelihood of administering naloxone was hypothesized, one should examine factors that could account for this ostensibly contradictory finding. Given the progression of the current pandemic since 2020 and various risks of exposure to and contraction of COVID-19, the finding that LEOs who endorse greater concerns of contacting COVID-19 are more likely to administer naloxone seems paradoxical. Arguably, individuals who perceive COVID-19 as a threat are likely to behave in a manner that protects themselves and/or others. Furthermore, individuals who value health may be more health conscious and willing to engage in behaviors that help others. The roles and responsibilities of LEOs are altruistic by nature, given the significant short- and long-term risks one may encounter throughout their career.

Expectancy-value models have been employed to predict behaviors in response to health threats (Kowalski & Black, 2021) and affirm that if a certain action is taken, a value returned for the effort is expected (Shillair, 2020). The protection motivation theory (PMT) might explain a LEO's willingness to engage in a behavior that is knowingly efficacious and could potentially save the life of an individual. According to Munro et al. (2007), PMT is the only theory within the broader cognitive perspective that explicitly considers the costs and benefits of existing and recommended behavior to predict the likelihood of change (Gebhardt & Maes, 2001). PMT was initially proposed by Carl Rogers in 1975 to better understand cognitive and behavioral responses to fear messages

pertaining to health (Rogers, 1975; Shillair, 2020).). This theory has continuously evolved to account for the complexities in cognitive appraisals, namely coping and threat appraisals (Munro et al., 2007).

PMT currently considers four factors that consequently influence an individual's willingness to begin a health-promoting behavior or to terminate a health-compromising behavior (Kowalski & Black, 2021). The four factors include perceived vulnerability to the health threat, perceived severity of the health threat, outcome efficaciousness of behaviors that would reduce the health threat, and self- efficacy (Brug et al., 2009; Rogers, 1975; 1983; Rogers & Prentice-Dunn, 1997). According to Bish and Michie (2010), health behaviors in response to pandemics are classified as either preventive, avoidant, or management of disease behaviors. Considering PMT, the LEOs most likely to engage in recommended COVID-19 protective behaviors are those who perceive a high degree of vulnerability to COVID-19 regard the virus as serious, believe that adhering to COVID-19 safety precautions will significantly reduce their risk of contraction, and are confident in their abilities to enact these safety precautions and procedures.

The increasing availability of personal protective equipment (PPE), access to COVID-19 vaccines, and evolving COVID-19 safety protocols within the Philadelphia Police Department are all agents that have progressed to reduce the risk of contraction. Respondents who endorsed a greater concern about contracting COVID-19 are most likely adhering to COVID-19 safety procedures and protocols, which in turn enables them to interact with the public. Although the risk of contracting COVID-19 while administering naloxone may be perceived as high, the benefit of reversing an opioid

overdose from occurring or saving one's life could outweigh the risk. This subjective cost-benefit-analysis process grounded by expectancy-value models of health behavior (Pligt & De Vries, 1998) could account for the greater likelihood a LEO would administer naloxone, despite concerns about contracting COVID-19.

A potential reason for insignificant findings between a respondent's score on the Addiction Belief Inventory (ABI) and likelihood of administering naloxone (Hypothesis 1) could be related to the psychomimetic properties of the measure itself. Even though the ABI has demonstrated reliability, specifically internal consistency and test-retest reliability, one should consider the poor-to-moderate range of internal consistency across the seven subscales (Luke et al., 2002). The existing assessment measures of attitudes and beliefs fail to precisely delineate distinct groupings of addiction models, ranging from the most common models (i.e., moral and disease models) to social models (i.e., social learning model, sociocultural model). Although Hypothesis 1 was not statistically significant, future measures with stronger psychometric properties that capture the current disease model of addiction should be considered in future research.

Implications

Program Development

Findings from this study can be used to refine current training curricula within the Philadelphia Police Department and guide the development of naloxone training programs across police departments. Based on the current findings, LEOs' knowledge on risk factors for an opioid overdose, signs of an overdose, actions to be taken during overdose, naloxone effects, and administration and aftercare procedures are critical in combating the opioid epidemic. Naloxone training programs should consider routine

assessment of LEOs' knowledge, especially for LEOs who do not encounter opioid overdoses as frequently as their counterparts in other police districts. Competency areas of opioid overdose recognition or naloxone administration should be continuously evaluated via routine training and posttests, similarly to cardiopulmonary resuscitation or rescue breathing for first responders.

Owing to the growing presence of novel synthetic opioids and extremely potent drug analogs, such as carfentanil (Pardo et al., 2019), LEOs must be cognizant of the signs of opioid overdose and recognize if additional naloxone administration is necessary, given the profound effects of synthetic opioid. Because LEOs in the Philadelphia Police Department are exposed to various forms of training on opioid overdose and naloxone administration throughout their tenure (Philadelphia Police Department, 2015), identifying the aspects of training that are most valuable and efficient in enhancing one's knowledge on opioid overdose and naloxone administration would be advantageous.

These identified forms of training could be best used in circumstances when dissemination of information is critical and time sensitive. Training on the dangers of airborne exposure to synthetic opioids, modifications in forms of naloxone (i.e., nasal spray, auto injectable) available to LEOs, and the management of naloxone administration while adhering to safety guidelines are examples of educational material that may require ongoing revision as public health issues arise and medical interventions develop. The unanticipated emergence of COVID-19 has substantially challenged first responder administration personnel to take action while considering the safety of both staff and the general public (The Department of Homeland Security and Technology, 2020). Effective and efficient training must be created to convey newly discovered

information on COVID-19 and educate LEOs on successfully navigating daily job responsibilities with possible limited resources (e.g., PPE, naloxone, staffing).

Considering that respondents who endorsed a greater concern of contracting COVID-19 were more likely to administer naloxone, these findings reinforce the importance of continuing access to PPE, COVID-19 vaccinations, and timely, scientifically based information on the progression of COVID-19. In the event another infectious disease deleteriously impacts the United States or regions across the country, a well-established, evidenced-based training curriculum on managing public health crises could minimize the logistical barriers LEOs have encountered and allow them to allocate more time toward daily occupational duties, including naloxone administration.

Professional Support Groups

LEOs' beliefs about the nature of, course of, and best treatments for substance users differ based on perception of addiction and could evoke feelings of frustration, anger, and helplessness for LEOs tasked to intervene in opioid overdose encounters (Banta-Green et al., 2013). Although LEOs are not legally bound to administer naloxone, research has revealed that adhering to and complying with the law is far easier when laws represent the social norms of individuals who must comply (Etzioni, 2000; Levi et al., 2009; Samuels, 2006). In the event that a majority of Philadelphia LEOs conceptualize addiction from a disease model to a lesser degree, findings could promote a need for support groups or peer-to-peer networks. Support groups facilitated by behavioral health, medical professionals, or peer-to-peer LEO networks could reduce stigma, reactivity, and negative emotions associated with substance users.

The Crisis Intervention Team program, an instructive and in-person crisis intervention skills training program for LEOs and mental health professionals, demonstrated a significant reduction in LEOs' desires to maintain social distance from people with substance use disorders, namely alcohol use disorder and cocaine use disorder (Bahora et al., 2008). In regard to the general public, educational pamphlets conveying positive illustrations about individuals with substance use disorders significantly reduced participants' stigmatized attitudes toward heroin and alcohol dependence (Luty, et al., 2008). Furthermore, research findings demonstrated a moderate decrease in stigmatizing attitudes toward individuals with alcohol use disorder following brief motivational interviews conducted by health professionals (Luty et al., 2009). Interventions targeting LEOs' stigma toward substance use are efficacious (Livingston et al., 2012) and should be further considered as a supplemental training opportunity for LEOs.

Mental Health Treatment for LEOs

LEOs across different rankings, departments, and regions in the United States have vocalized various concerns about COVID-19 and its impact on both their occupational roles and livelihood. An estimated 30% of first responders develop behavioral health conditions, including, but not limited to, depression and posttraumatic stress disorder (PTSD) in comparison to 20% among the general population (Abbot et al., 2015). Moreover, approximately 125 to 300 police officers commit suicide every year (Substance Abuse and Mental Health Services Administration, 2018). According to Blue H.E.L.P., a nonprofit organization that advocates suicide prevention among LEOs, 228 current or former officers died by suicide in 2019, compared with 172 in 2018 (Barr,

2020). Given the greater prevalence rates of mental health conditions, such as depression and PTSD, in LEOs in comparison to the general public, findings from this study may reveal a heightened degree of concern held by Philadelphia LEOs. Support groups and increased opportunities for LEOs to receive mental health screenings or treatment could further advance the quality and quantity of assistance that police agencies currently offer LEOs. Furthermore, the current advancement of mental health services via telehealth may be a more feasible option for LEOs because of repeatedly changing work schedules, fear of stigma from receiving mental health treatment, or practical limitations regarding COVID-19 safety guidelines and in-person mental health treatment (The Centers for Disease Control and Prevention, 2020g; Stuart, 2017). As organizational and operational stressors have shown to promote burnout and development of mental health disorders as long-term consequences for LEOs (Collins & Gibbs, 2003; Gershon et al., 2002; Golembiewski & Kim, 1990), the Philadelphia Police Department could consider ancillary mental health services to mitigate any further staffing shortages and decrease in productivity throughout COVID-19 and in the future.

Improvement of Occupational Health

Results highlighting LEOs' concerns about COVID-19 may also contribute to an evolving line of research on occupational health and safety for first responders during a pandemic or public health crisis. Because training and use of naloxone for first responders extended from emergency medical technicians (EMTs) and firefighters to LEOs (Davis et al., 2015), the following are imperative: (a) clarification of factors that contribute to LEOs' likelihood of naloxone administration and (b) the most effective and efficient support of LEOs via training, safety, and health-related interventions.

Strengths

The sample size of this study is a major strength. Although the number of respondents varied across police districts, all 21 police districts were represented in the study. Regarding demographic variables, respondents had a wide range of years of experience and levels of education. Diversity was prominent across age and race/ethnicity, which is imperative to account for regarding external validity. Consideration of qualitative data from respondents provided a more detailed understanding of LEOs' willingness and barriers to administering naloxone that would not otherwise be captured with only quantitative data. Overall, the significant findings of this study are a primary strength and can be used as a framework for additional studies involving the Philadelphia Police Department or other large-scale police departments.

Limitations

Potential threats to internal and external validity are inevitable in empirical research studies and require further examination to ensure findings are illustrated and interpreted with caution. Several limitations to this study include use of self-report measures and a case vignette, psychometric properties of measures, and sample size. Although self-report measures are practical and deemed valuable in the sense that self-report data can capture a participant's perspectives and opinions, numerous biases may arise for each participant (Althubaiti, 2016). Two types of participant response biases are social desirability and recall bias (Latkin et al., 2016). Some of the questions participants were prompted to answer entailed private and sensitive information about their beliefs and potential actions based on an opioid overdose vignette and concerns about COVID-19. The social desirability bias accounts for a participant's response that may portray

themselves in a more favorable and socially desirable light rather than responding in a manner that is most consistent with their true feelings or actions (Grimm, 2010).

Participants may have endorsed questions that were consistent with the disease model of addiction, responded to the case vignette in such a manner that did not truly capture how they would respond to an individual overdosing from opioids, and/or minimized degree of concern about contracting COVID-19.

Recall bias is another potential bias in which participants may provide inaccurate information resulting from inability to remember specific information elicited by the survey (Althubaiti, 2016). Participants may have difficulty responding to questions about past naloxone training experience or the number of overdose individuals encountered as a LEO. The researcher attempted to control for recall bias by including questions about experience and training in the screener and demographic sections to minimize an over or underestimation of demographic characteristics or fatigue after vignette and post vignette questions. Additionally, to control for social desirability bias, the Opioid Overdose Knowledge Scale (OOKS; Williams et al., 2013) and ABI (Luke et al., 2002) were provided after exposure to the case vignette to minimize a priming effect of LEOs' knowledge and attitudes of opioid overdose and naloxone administration. All self-report measures and demographic information obtained in the study were anonymous, likely controlling for social desirability bias.

Another limitation of the study may be associated with psychometric properties of self-report measures, specifically the ABI and the post vignette questionnaire developed by the researcher. The low internal consistency for several of the subscales in the ABI, namely the responsibilities for actions, genetic basis, and moral weakness subscales, is an

important limitation to consider (Luke et al., 2002). Developers of the ABI appear to have sacrificed higher internal consistency per subscale by minimizing the number of items (i.e., an average of 3-5 items) within each subscale and for a shorter overall measure (Broadus et al., 2010). Consequently, the items included in the ABI do not fully capture prominent addiction attitudes and are limited to the disease, genetic, and psychological models of addiction (Broadus, 2012). The minor overlap between some of these differing models make the development of items that specifically assess one particular model of addiction challenging. Furthermore, the post vignette questionnaire developed by the researcher was not formally assessed for validity and reliability, thus possibly influencing research findings. The researcher attempted to control for threats to psychometric properties by consulting with dissertation committee members who are competent and trained in the development of assessment measures.

The use of a vignette may be an additional limitation. First, LEOs' behaviors and reactions to an individual overdosing from opioids may differ in a vignette compared to a real-life encounter. Furthermore, the vignette may not fully depict the nature of responding to opioid overdose calls as it relates to specific areas in Philadelphia, time of day, and interactions with other first responders or witnesses. These possibilities pose notable threats to internal and external validity of the research findings. The researcher attempted to control for threats to validity of the case vignette by considering the demographic variables, including age, gender, and race/ethnicity, of individuals who have demonstrated the highest rates of naloxone administration in Philadelphia from emergency medical service (EMS) providers in 2019 and hospitalizations attributable to opioid poisoning in 2018 (The Department of Public Health: City of Philadelphia, 2020).

The location described in the case vignette was found to have between 94 and 188 EMS naloxone administrations in 2019 when grouped via zip code, ranking the 19140 zip code as the second highest group of naloxone administration counts in Philadelphia (The Department of Public Health: City of Philadelphia, 2020). The researcher also consulted with a panel of three active LEOs based in different police districts of the Philadelphia Police Department to ensure accurate representation of opioid overdose encounters.

Owing to the stringent inclusion criteria of active LEOs in the Philadelphia Police Department, this study may have limited external validity. Philadelphia's current state of affairs as they relate to the opioid-related overdoses and active participation in naloxone programs throughout the police department starkly differ from those of other communities and regions across the United States (Board of Health, 2019; Farley, 2019). The limited sample size precludes generalizability of the research findings to all LEOs because of the numerous differences in naloxone training programs, naloxone access to LEOs, opioid overdose incidence rates, and policies/laws that regulate enforcement versus harm reduction.

Future Directions

Program Development

Because of the political, social, and medical complexities of the opioid epidemic, a substantial amount of research needs to address these domains and further inform evidenced-based practices to support individuals with opioid use disorder (OUD). Future research evaluating the efficacy and efficiency of naloxone training programs available to LEOs throughout the United States must be considered. Also, assessment of naloxone training programs that include COVID-19 safety guidelines should be studied further,

specifically instruction of LEOs (i.e. in person vs. online training). Findings from naloxone training programs that have embedded COVID-19-specific response strategies could contribute to the limited research on short-term and long-term efficacy of policing strategies in response to public health crises (Laufs & Waseem, 2020). Because police departments at local and state levels function independently (Potter, 2013), the likelihood is greater that they differ in the number of naloxone training opportunities and training curriculum/objectives. Future research could reveal areas of strength and improvement of naloxone training programs and subsequently mitigate excessive costs, work inefficiency, and unnecessary resources used to sustain naloxone training programs. Findings could then inform the development of future training programs for police departments that have identified lack of resources and funding as primary barriers (Police Executive Research Forum, 2016).

Program evaluation of existing naloxone training programs could assist in the development of a standardized naloxone training protocol for all police departments in the United States. To date, there is a lack of randomized controlled trials examining opioid overdose prevention programs that include naloxone distribution (Boyer, 2012), the gold standard for analyzing causal relationships and effectiveness of a new intervention (Hariton & Locascio, 2018). From a program development perspective, future research could also target standardization of overdose education and naloxone distribution (OEND) community-based programs for laypersons. With the exception of police-related responsibilities, most of the training content provided to LEOs (i.e., opioid overdose prevention, recognition, and response) is translatable to other parties (Mueller et al., 2015; Philadelphia Police Department, 2015). The expansion of community-based

OEND programs and naloxone programs across police departments has indicated reductions in the number of fatalities from opioid overdose (Centers for Disease Control and Prevention, 2011b; Rando et al., 2015; Walley et al., 2013), a promising notion for political, social, and medical stakeholders to consider.

Resources for LEOs

The evolving roles and responsibilities of LEOs, including exposure to high-risk, hazardous, and traumatic events, justify the need for accessible health and mental health resources. Although concerns related to COVID-19 and encounters with opioid overdose individuals may capture only a portion of LEOs' daily job-related stressors, these factors have already demonstrated profound effects on an individual's physical and mental health. Future research should first examine the use of mental health and health resources within their respective departments and fulfill areas of need that could reduce burnout and development of medical and/or mental health conditions. As the COVID-19 vaccines become more accessible to first responders and the general public, future research should further evaluate the implications of these factors on willingness to administer naloxone.

Substance Use Attitudes and Belief Measures

Attitudes and beliefs related to substance use and substance users have been widely studied among medical and clinical providers, laypersons, criminal justice personnel, and cultures. (Kelleher, 2007; Kulesza et al., 2015; Kulesza et al., 2016; Lee & Rasinski, 2006; MacCoun, 2013; Matheson et al., 2014; Mundon et al., 2015; Szapocznik et al., 2007; Tsai et al., 2019; Van Boekel et al., 2013). The complexity of attitudes and the multifaceted features (Eagly & Chaiken, 1993) make isolating one

dimensional factors significantly challenging. The difficulty in discerning factors within attitudes is a consistent problem across measures that examine addiction attitudes.

Furthermore, existing addiction attitude measures perhaps fall short of precisely examining attitudes across differing populations among the general public (Broadus, 2012). Future research should further examine the standardization of existing measures as related to construction, administration, and scoring. Doing so could subsequently inform development of new addiction attitude measures.

Although the commonly used measures to assess attitudes and beliefs have demonstrated validity and reliability (Humphreys et al., 1996; Moyers & Miller 1993; Schaler, 1995), a limited number of measures exist, and many of them were developed within the early 1990s to early 2000s. The verbiage of items used to describe drug use behaviors (e.g., “take a hit”; Humphreys et al., 1996), substances, and addiction in many of these measures are outdated and no longer used in clinical/medical practice. Furthermore, such terms as “drug addict,” “alcoholic,” “liar,” and “dysfunctional” used within these measures (Humphreys et al., 1996; Moyers & Miller 1993; Schaler, 1995) reinforce the stigma of substance use disorders and could unintentionally elicit certain thoughts or feelings for the respondent. Future research must focus on the development of new measures to assess an individual’s attitudes and beliefs about substance use and substance users. Researchers should consider the following factors in development of assessments: cultural sensitivity, appropriate reading level for respondents, reduction in jargon, and inclusion of strengths-based language when describing substance users.

Policy Research

Although naloxone access laws and Good Samaritan Laws for first responders and laypersons continue to evolve, limited research on the effects of these laws on opioid use and mortality rates exists (Bazazi et al., 2010; Kim et al., 2009). Current research suggests no evidence of increase in opioid use; however, replication of these studies along with longitudinal studies is imperative in dismissing assumptions of the general public and policymakers (Bazazi et al., 2010). An increasing volume of evidence suggests that supplying naloxone does not encourage opioid users to increase their drug use, nor does it increase the likelihood that they will harm themselves or others around them (Maxwell et al., 2006; Seal et al., 2005; Wagner et al., 2010). Future research could advise the remaining states on the benefits of naloxone for various groups (i.e., laypersons, first responders, medical professionals) that have yet to adopt naloxone access laws or Good Samaritan laws specific to opioid overdoses. Objective and factual information derived from future research could promote a sense of urgency to implement policies or laws that would benefit the general public.

Criminal Justice System

Further examination of the efficacy of interventions and drug treatment programs implemented by the criminal justice system is interictal at the local, state, and federal level. As law enforcement diversion programs, prosecutor diversion programs, and drug treatment programs generate across various criminal justice system levels (Center for Substance Abuse Treatment, 2005), future research must target the effectiveness of these programs in reduction of substance use, recidivism, criminal activity, overdose rates, and infectious disease rates. For lawmakers to make well-informed decisions on the most

effective and cost-efficient interventions and programs, future research outlining program evaluation is the first step in this process. Many states have yet to implement alternative interventions to incarceration, and one should note that skepticism toward treatment effectiveness among prosecutors and LEOs has been established as a general concern (Belenko et al., 2013). Owing to COVID-19 and the changes in policing across the nation, future research should evaluate the effectiveness of these modified policing strategies, particularly in areas of high opioid overdose incidence rates. Medical, psychological, or law enforcement interventions that may not have been considered prior to COVID-19 could prove to be practical and feasible options moving forward. Research findings highlighting the benefits of drug court/treatment programs and improved welfare of offenders make refuting consideration of implementing these efficacious interventions in their respective communities difficult for lawmakers and criminal justice personnel.

Medical and Public Health Research

Medical personnel, pharmaceutical companies, and treatment of pain are considered some of the primary variables in the development of the opioid epidemic (Guy et al., 2017; King et al., 2014; Skolnick, 2018). Advances in the conceptualization and treatment of pain have been substantial since pain management guidelines became a requirement in the medical field (Wardhan & Chelly, 2017). Pain treatment guidelines continue to evolve today and are more grounded in science findings (Chou et al., 2016), allowing medical providers to use evidence-based clinical practices. Parallel to the advancement of pain management guidelines, comprehensive, valid, and reliable assessments are necessary to accurately assess pain and assist in medical providers' adherence to pain management protocols. Future research should aim to improve

assessment measures of pain, acute and chronic, as both differ in their onset, course, severity, and treatment regimen (Raffaelli & Arnaudo, 2017). By developing more reliable and valid measures for pain, providers may have a greater opportunity to detect development of pain conditions and use preventative, less invasive, and nonopioid interventions.

Given the development of COVID-19, future research should evaluate the concurrent impact of both public health crises. Incidence rates of opioid overdose deaths, naloxone accessibility to the public and LEOs, and revisions to police department protocols on naloxone administration are domains that require immediate and ongoing assessment. Because the opioid epidemic and COVID-19 have drastically impacted the nation in a multitude of ways (Grinspoon, 2020), future research must explore feasible and practical solutions to best support first responders, ensure their safety, and fulfill the treatment and recovery needs of individuals with substance use issues. The undeniable burden of the opioid epidemic has dramatically impacted both countless individuals, including family members and friends of substance users, and communities across the United States. Further evaluation of society's attitudes, beginning with evaluation of first responders and treatment providers, should be prioritized because of the numerous implications in assessment, prevention, and treatment.

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APPENDIX A

E-mail and Social Media Posting Advertisement

My name is Nicole Gulkis and I am a 4th Year Clinical Psy.D. student at the Philadelphia College of Osteopathic Medicine. I am currently seeking participants for a study to understand how to improve naloxone training within the Philadelphia Police Department. **Participants must be active law enforcement officers** (ages 22 to 70 years old) and rank as a police officer or higher from any of the 21 police districts in the Philadelphia Police Department. **Participants must also have received naloxone training by the Philadelphia Police Department during or after 2015.**

If you choose to participate in this study, you will be asked to complete a demographic questionnaire followed by survey questions. Your participation will be completely voluntary and **anonymous**, meaning that the reporting of data will not identify or be associated with you in any way. In addition, you may discontinue your participation at any time without consequence.

If you are deemed eligible to participate in the study and complete the survey in its entirety, you may choose to enter a secured raffle to potentially win **one of six \$25 Visa gift cards**. I, Nicole Gulkis (Nicolehen@pcom.edu), am the responsible investigator and under the supervision of Professor David Festinger (davidfe@pcom.edu), chair my of dissertation committee. If you understand the nature and terms of participation in this study and agree to participate, please click the link below to begin survey:

APPENDIX B

REDCap Survey

Please answer the following questions as truthful as possible. All information will be confidential.

Screener Questions

1. What is your age?
_____ (Text box to enter number)
2. How long have you been employed by the Philadelphia Police Department?
_____ (Text box to enter number)
3. Did you complete naloxone training in the Philadelphia Police Department **DURING** or **AFTER** 2015?
 - a. Yes
 - b. No
4. What is your **CURRENT** employment status within the Philadelphia Police Department?
 - a. Employed Full-Time
 - b. Employed Part-Time
 - c. Employed by another police department
 - d. Unemployed
 - e. Retired
5. Are you capable of reading English fluently?
 - a. Yes
 - b. No

Demographic Questionnaire

1. What is your age?
(Text box to enter number)
2. What gender do you identify as?
 - a. Male
 - b. Female
 - c. Other (Please Specify) (Short Answer Space)
3. Which of the following best describes you?
 - a. White or Caucasian

- b. Black or African American
 - c. Hispanic or Latino
 - d. Asian or Pacific Islander
 - e. Multiracial or Biracial
 - f. Other (Please Specify) (Short Answer Space)
4. What is the highest degree or level of education you have completed?
- a. Some high school, no diploma
 - b. High school graduate, diploma or the equivalent (for example: GED)
 - c. Some college credit, no degree
 - d. Trade/technical/vocational training
 - e. Associate degree
 - f. Bachelor's degree
 - g. Master's degree
 - h. Doctorate degree
5. How many TOTAL years have you been employed as a law enforcement officer ?
(including Philadelphia Police Department and other police departments)
_____ (Text box to enter number)
6. What police district are you CURRENTLY assigned to?
_____ (Text box to enter number)
7. During your experience as a police officer, how many opioid overdose individuals have you encountered?
_____ (Text box to enter number)
8. During your experience as a police officer, how many times have you administered naloxone? (excluding trainings)
_____ (Text box to enter number)

APPENDIX C

Vignette

You have two naloxone (Narcan) nasal kits, protective masks, and gloves in your squad car. While on patrol, you and your partner respond to a hospital case from dispatch at 2:30 P.M. about an unconscious 30-year-old male. Upon arrival, you find a man with a slender build in ragged clothing slumped on his side on a bench. His body is limp, his breathing is very slow and shallow, and his lips have turned blue. He is unresponsive to verbal commands. You observe an uncapped hypodermic needle in close proximity to the unconscious man. Dispatch informs your partner that the fire department will arrive in five minutes

Post Vignette Questionnaire

Item 1: Based on the scenario you just read, how likely would you be to administer naloxone (Narcan) to the individual experiencing an opioid overdose?

1) Not at all Likely 2) Not Likely 3) Somewhat Likely 4) Likely 5) Very Likely

Item 2: Based on the scenario you just read, how likely would you be to wait for the fire department to administer naloxone (Narcan) to the individual experiencing an opioid overdose?

1) Not at all Likely 2) Not Likely 3) Somewhat Likely 4) Likely 5) Very Likely

Item 3: What is/are the reason(s) you would wait?

Item 4: What characteristics, if any, of the individual or situation might impact your willingness to administer naloxone?

Item 5: I am concerned about contracting Coronavirus (COVID-19) while administering naloxone (Narcan)

1) Strongly disagree, 2) Disagree, 3) Neutral, 4) Agree 5) Strongly agree

Item 6: What part(s) of the administration process are you most concerned about?

Item 7: What concerns you most about contracting COVID-19?

Thank you for your participation. If you are interested in being entered in the raffle to win one of six \$25 Visa gift cards, please click the following link.