DUBAI MEDICAL COLLEGE FOR GIRLS

The effectiveness of evidence-based detoxification treatment protocol adopted by nurses caring for patients with opioid use disorder

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Word Count: 14,423

MSc Addiction Science

Submission Date:

September 2021

"بسم الله الرحمن الرحيم"

"In the name of Allah, the most gracious, the most merciful"

Acknowledgements

“To my father, may Allah have mercy on him, and to my mother, may Allah preserve her in good health and happiness.

To my wife who has always supported me, and my children, may Allah protect you and bless you all, and bring happiness to your hearts.

I would like to extend my thanks to a number of people who contributed to successful completion of this project.

First and foremost I would like to thank all of my academic supervisors, Dr. Rasha Eldeeb and Prof Hafez Ahmed, who agreed to take part in the study and were willing to offer me their precious time, and flooded this thesis with their invaluable inputs. Without their support this study would not have been possible.

Second, I would like to thank my clinical supervisor Dr. Wael Fouad, who stood with me and lit me up to start this project, and guided me step by step to complete this thesis. Dr. Wael played a role model as a professional research expert. Without his support, this study could not even begin.

Thanks also go to Dubai Medical College, Erada Center and Dubai Health Authority including all of their staff to grant me all ethical approval and all required access to complete this thesis.

Finally, I would like to extend my thanks to Prof. Hamdy Moslehy and Dr. Mohammad Fayek, for everything they have been done. There is no words enough to thank them for their support, encouragement, and inspiration. Prof. Hamdey has been the godfather to implement this program. Dr. Fayek has been the godfather who create this program.”

Abstract

Introduction: Substance use disorders **(**SUDs) have been investigated thoroughly over the past couple of decades due to the growing availability of drugs and seriousness of the problem across the globe. Opioid Use Disorder (OUD) remains a significant public health concern due to its impact on the physical, psychological and social health and well-being and the burden it has on the society.

Aim: The current study aims to assess the effectiveness and impact of an evidence-based detoxification treatment protocol, specifically Buprenorphine/ Naloxone (Suboxone) protocol, applied to patients with OUD in reducing the withdrawal severity, the pain score and successful treatment completion rate.

Methodology: The current study adopted a retrospective case-note review based at a single center based in Dubai, UAE. The data was collected from patients at the Erada Center for Treatment and Rehabilitation, a facility that aims to treat SUDs and alcohol addiction. The study collected data from 200 cases who met the selection criteria. Data relating to clinical opioid withdrawal scale (COWS) and Pain Intensity were collected over a 14-day period with the majority of subjects (n = 184) having received (Buprenorphine/ Naloxone) protocol.

Results: Initially, the Wilcoxon test was conducted to assess the changes to COWS scores. The test showed that there was a statistically significant difference ($Z = -8.234$, $p < 0.001$) between the pre- and post-scores. Further, the study identified a statistically significant difference in pain scores ($Z = -5.413$, $p < 0.001$) between the pre- and post-score. The pain score revealed that in most cases (n = 55) there was no change in the pain score, but there were more cases shows reductions in pain score (n = 49, M = 32.49) compared to increases in pain score (n = 10, M = 17.80). Lastly, Chi Square test conducted to observe if (Buprenorphine/ Naloxone) was beneficial to treatment completion rate. The relation between variables was found to be non-significant X^2 (1, n = 200) = 0.45, p = 0.831. This suggests that (Buprenorphine/ Naloxone) protocol was not more likely to improve treatment completion.

Conclusion: Suboxone is an effective protocol to support reductions of patient's opioid withdrawal and pain intensity, but does not have an effect on treatment completion.

Key Words: Opioid Use Disorder, (Buprenorphine/ Naloxone) Suboxone, COWS, Pain, Treatment compliance

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Glossary of Abbreviations

COWS	Clinical Opioid Withdrawal Scale
DAMA	Discharged Against Medical Advice
DSM-5	The Diagnostic and Statistical Manual of Mental Disorders 5
GCP	Good Clinical Practice
MENA	Middle East and North Africa
NICE	National Institution of Health and Care Excellence
OUD	Opioid Use Disorder
PRN	A Latin phrase which stands for “if necessary
RGF	Research Governance Framework
SUD	Substance Use Disorder
UAE	United Arab Emirates
WHO	World Health Organization

Chapter 1. INTRODUCTION

The initial chapter of the dissertation will provide an insight into the knowledge currently known and understanding regarding Substance Use Disorders (SUDs), including what they are, how they appear and the potential risks associated with the disorder. The chapter will further justify the relevance of the topic for the current investigation and the clinical importance that the current study poses. The chapter will conclude with a presentation of the study's aims, objectives and hypotheses.

1.1 Substance Use Disorders

SUDs have been investigated thoroughly over the past couple of decades due to the growing presence of substances of misuse/ growing risks associated with substances use across the globe. In most cases, studies have focused on substances including nicotine and alcohol (Chassin et al., 2016; Oreskvoich et al., 2015) as these have often been found to be used in collaboration which has led to engagement in other risky behaviours or problematic alcohol use (McCambridge et al., 2011; Dissabandara et al., 2014).

However, further studies have also noted that usage of drugs such as cannabis can also lead to the subsequent progression of both licit and illicit drug use (Tanaree et al., 2017), which has led to the view of cannabis as a gateway drug as outlined by the gateway theory (Miller & Hurd, 2017).

SUDs have been identified as a global health problem, with the World Health Organization (WHO) (2021) noting that such disorders, when untreated, can lead to increased mortality and morbidity risks as well as leading to the triggering of substantial suffering and impairments in personal, family, social, educational, occupational and other functional areas. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) bases a diagnosis of dependence on the presence of two to three symptoms from a defined list. This includes taking the substances in larger amounts or for a longer period than advised, failing to reduce or stop substance use and experiencing cravings and urges to use the substance (Hasin et al., 2013; Goldstein et al., 2015). The DSM-5 defines SUDs as a pattern of symptoms resulting from the use of a substance that an individual continually consumes despite experiencing problems resulting from consumption. Such definitions have been supported in the literature with studies such as Rehm et al. (2013, p.633), further defining SUDs as 'heavy substance use over time' which has received

praise for the removal of stigma surrounding SUDs as a redundant concept that is replaced by symptom counts as well as the amount and duration of substance use (Saunders, 2013).

The decision to view SUDs in this manner is primarily related to five rationales: the psychological brain changes associated with SUDs increased substance-related morbidity and mortality in a dose-response manner, withdrawal and tolerance, SUDs use and social consequences used to define a SUD and the fact that a consumption-based definition implicitly encourages reduced consumption and would allow at-risk individuals to be identified more easily (Bradley & Rubinsky, 2013). Such changes to the definition provide an opportunity for the thought processes and perceptions of SUDs to alter, leading to an increasing number of people coming forward to seek help for their disorder (Rice, 2013). However, there are limitations to viewing SUDs in this manner. Consider the views of Heather (2013), who noted that such views are flawed by the inability to identify the concepts of dependence and addiction in the DSM definitions as well as appearing as more of a 'tick-box approach' that leads to be considered regarding addiction.

Previously in DSM-4, the distinction between substance abuse and dependence was classified as abuse being a mild or early phase of substance use, with dependence being classified as a more severe manifestation. The updated DSM-5 has been praised due to its ability to provide a precise, more appropriate DSM-5 diagnosis similar to the symptoms that patients often experience (Hasin et al., 2012).

1.2 Substance Use Disorders Epidemiology

The global prevalence of SUDs has continued to rise over the past decade, with the United Nations (2021) noting that in 2021 there are approximately 275 million drug users worldwide, with a substantial increase in cannabis usage being noted. In the same report, it was suggested that between 2010 and 2019, drug use had increased by 22%, although this was suggested to be associated with the increased population growth. However, the United Nations have estimated further growth in drug use by 11% increase in drugs globally, with Africa expected to increase by 40% due to the population growth. A report from Ritchie and Roser (2019), based on data from 2016, found that illicit drug use is, directly and indirectly, responsible for 11.8 million deaths each year, with 11.4 million individuals dying prematurely due to smoking, alcohol and drug use annually. This includes 350,000 deaths from overdoses annually, with more than 50% of deaths

occurring in people under 50. On a global scale, alcohol and illicit drug addiction are responsible for approximately 1.5% of the global disease burden, but this increases to more than 5% in particular countries including the USA, Russia and Estonia. Further, Degenhardt et al. (2018) found that the burden of disease from drug use increased in countries with a higher socio-demographic index, whereas alcohol dependence was attributed to a low socio-demographic index.

However, such findings appear to contrast additional data. Peacock et al. (2018) provided insights into data from 2017, which found that Europeans suffered proportionately more due to the increasing economic impact of SUDs but reported that the mortality rate was greatest in low- and middle-income countries with large populations. However, Peacock and colleagues note the lack of data currently available in such countries, highlighting a key issue currently persisting in the literature. However, there is extensive evidence of the contribution of SUDs to global disease burdens due to the impact such consumption can have on other health outcomes the study of Kamenderi et al. (2021), who investigated drug and substance abuse status among the general Kenyan population reported that 6% of the population aged 15-65 years had multiple drug and substance usage, which presents a serious challenge for the country.

1.2.1 Opioid Dependence

Opioid dependence is a form of SUDs that has long been established as a substantial contributor to the global disease burden, although its contribution to premature mortality varies based on region. Studies have established areas including North America, Eastern Europe and Southern sub-Saharan Africa as being the most strongly affected areas (Degenhardt et al., 2014; Whiteford et al., 2015; Kurth et al., 2018). The United Nations (2019) reported that approximately 53 million individuals are opioid users, which increased by 56% compared to previous estimates, with opioid use being responsible for two-thirds of the 585,000 deaths occurring from drug use in 2017.

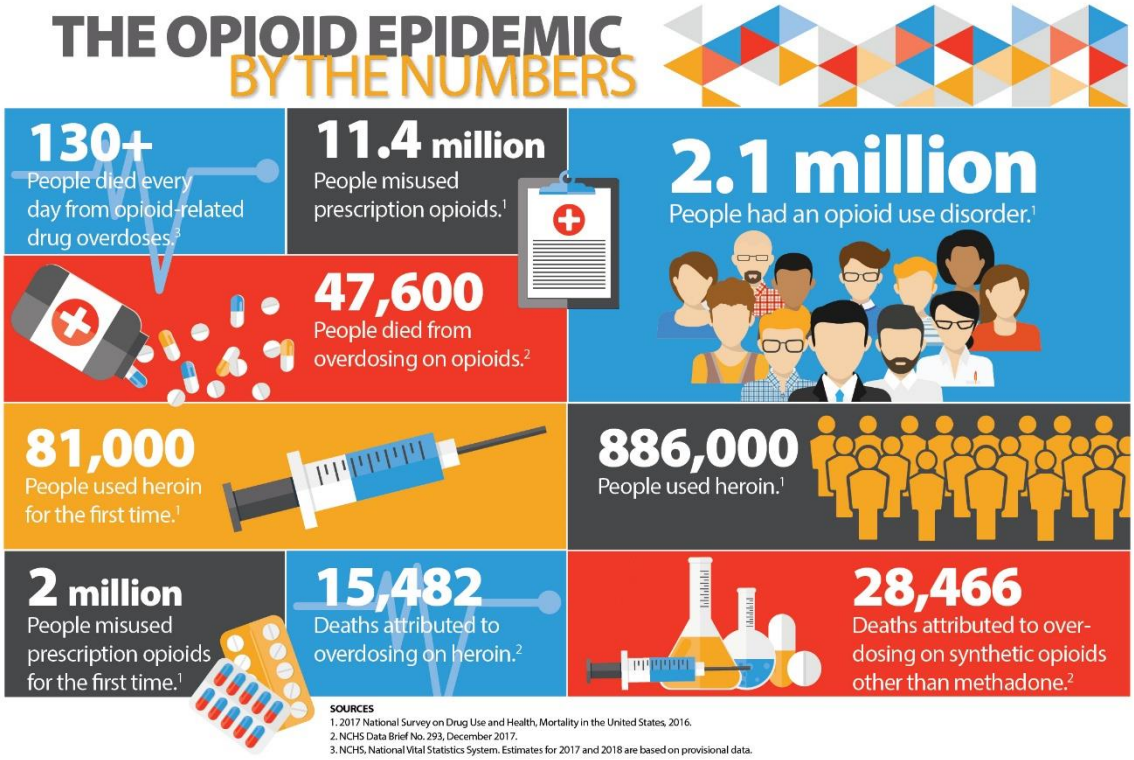


Figure 1. ***A summary of the impact of OUD in the US as reported by the US Department of Health and Human Services (2019)***

An opioid is a compound resembling opium in addictive properties or physiological effects used to treat moderate to severe pain. In modern medicine, opioids are similar to opiates, including morphine and codeine, although these are not made from opium. The use of such medications helps to reduce pain by binding to opioid receptors in the central nervous system. In 2009, reports found that 79.5 million prescriptions for opioids were made to 39% of the US population, with most of the prescriptions being for hydrocodone- and oxycodone-containing products (84.9%), with some patients being as young as ten years old (Volkow et al., 2011). Further examples of commonly prescribed opioids include Methadone, Tapentadol and Hydrocodone, while further illegal sources include heroin.

Opioid Use Disorder (OUDs) remains a significant public health concern due to the impact it has on physical, psychological and social health and well-being and the burden it has on society (Ayanga et al., 2016). While Morris and Mir (2015) reported that the vast majority of the global consumption of opioids (80%) as well as 99% of the global hydrocodone supply, occurs in the US (Manchikanti & Singh, 2008), a key issue has arisen in understanding the data pertaining to opioid consumption in areas such as the

Middle East and North Africa (MENA) where data is limited. While previous studies (Silbermann, 2011; Silbermann, 2010) have noted that there continues to be an increase in opioid use in such areas, with an increase of 19.8% of morphine and 31.3% of fentanyl from the 1980s to 2010, there continues to be a lack of data pertaining to the extensive usage across MENA populations. While SUDs remains a global problem with no boundaries, the United Arab Emirates (UAE) remains at the front of the battle against opioid use. Previous studies have noted that opioids such as tramadol and heroin remain widely used in the region and have similar usages to that of alcohol (Alblooshi et al., 2016). Previous studies have noted the use of substances within the UAE in line with its cultural and historical contexts; using such substances is forbidden by the Holy Quran and is not deemed culturally acceptable (Al Ghaferi et al., 2017). While there remains a lack of national statistics on SUDs trends within the UAE, there continue to be growing numbers of patients seeking treatment or being referred through court systems to rehabilitation centers (Elkashef et al., 2013). To provide opportunities to enhance the understanding of the current stance of opioid use in UAE and middle eastern populations, it is key that an extensive investigation of the literature is conducted, which may provide greater insight into appropriate treatments that can support OUDs treatment and recovery.

1.3 Study Rationale

Research into the most appropriate forms of treatment for SUDs and, more specifically, OUDs has continued to grow over the past decade, but there continues to be a lack of understanding of the impact of specific protocols such as buprenorphine/ naloxone (suboxone) in MENA populations. This is largely due to the lack of data currently available, which has led many researchers to believe that the problem in MENA, and more so UAE, is larger than thought. As discussed previously, OUDs can present significant public health issues in terms of physical, psychological, social and environmental health and wellbeing and ensuring that these individuals receive appropriate care and support to gain access to effective and successful treatment and rehabilitation.

The use of buprenorphine/ naloxone (suboxone) has been found to have many therapeutic advantages compared to methadone, including a reduced risk of overdose-related death, increased portability and improved safety profile (Jones et al., 2018; Dematteis et al., 2017). However, studies have noted that suboxone can exacerbate pain symptoms or induce independent withdrawal in individuals, which is a potential

limitation (Dugosh et al., 2016; Burma et al., 2017). However, the effectiveness of detoxification treatment protocols utilized by the rehabilitation centers in the UAE is of key consideration to understand if they effectively support successful recovery from OUDs. Therefore, the need for the current study is rationalized due to the key insights it can provide into the use of suboxone in a treatment and recovery facility, which can allow an understanding of the impact of such protocols being applied to OUD patients and if it can be deemed to be effective. This would provide opportunities to highlight and address literature gaps while also noting where further investigation is required.

1.4 Potential Clinical Impact

Due to the nature of the study, it is possible to understand better the impact of two forms of detoxification programs on OUD patients in the UAE. As the study is collecting data from an appropriate sample of patients who had attended a rehabilitation center, this provides an opportunity to inform the methodological properties of future studies by providing insights into the impact of sample size and hypothesis generation, which can inform future investigations. Further, the present study can provide opportunities to understand effective detoxification programs and therefore the impact this can have on pain intensity, treatment discharge type, opiate withdrawal signs and symptoms and the way these are managed during the patient's time in the inpatient setting. This can lead to guidance for best practices being provided and the development of recommendations to support future practice in similar environments. Finally, the findings from the current study may lead to more economically sound treatments being provided that are effective and can reduce the usage of other treatment forms deemed less effective.

1.5 Aims and Objectives

The current study aims to assess the effectiveness and impact of evidence-based detoxification treatment protocol, specifically the suboxone protocol, applied to patients with OUDs in:

A- Reducing the withdrawal severity
B- Reducing the pain score
C- Successful treatment completion rate.

To achieve these aims, the current study objectives focus on assessing the severity of withdrawal symptoms as measured by Clinical Opioid Withdrawal Scale (COWS)

score. The overall success of applying the COWS score protocol will be determined by reductions in the withdrawal severity scores, pain scores, and the type of discharge from the center as classified as either with or against medical advice. The current study will collect data relating to withdrawal COWS score and pain score. Further, the data will compare COWS score and pain score outcomes for patients receiving suboxone protocol. Further, the data will assess the inpatient treatment completion rate utilizing the percentage comparison of the type of discharge.

1.6 Hypotheses

Based on the aims and objectives, the current study has three primary hypotheses;

H_1: There is a significant reduction in COWS outcome while applying the protocol.

H_0: There is no significant reduction in COWS outcome while applying the protocol for the opioid dependent patients.

H_2: There is a significant difference in pain score before and after applying the protocol.

H_0: There is no significant differences in pain score before and after applying the protocol.

H_3: There is a significant difference in completion of the in-patient treatment.

H_0: There is no significant completion of the in-patient treatment percentage.

For reference, H_0 depicts the null hypothesis for each of the expected hypotheses of which will each be examined and addressed in the discussion chapter.

Chapter 2. LITERATURE REVIEW

The current chapter aims to provide a comprehensive overview and scholarly critique of the current evidence base as identified through Google Scholar and PubMed databases. In the following section, detailed insight into the applied search strategy will be discussed and provide insight into the wealth of literature pertaining to the different forms of treatment currently utilized for OUDs and the impact and longevity of relief this has offered to patients. This will allow an opportunity to relate the findings from the literature to the research question, allowing an effective comparison to be made and debates to be highlighted.

2.1 Search Strategy

An electronic database search was conducted to ensure appropriate data was identified utilizing four databases: PubMed, ScienceDirect, MEDLINE and CINAHL. A further search was conducted utilizing the academic search engine Google Scholar. The decision to utilize these databases was due to a strong support base that noted that these databases could provide access to grey and published, peer-reviewed journal articles that can provide key insights into the research topic. Further, this can provide access to several insights and perceptions across the globe and the forms of treatment offered to OUD patients and how this has impacted rehabilitation and cessation.

To further develop the identification of relevant studies, the review implemented the Boolean search operators, which allowed for a more focused approach to literature searches (Karimi et al., 2010). The use of Boolean operators has been encouraged due to the ability to utilize terms such as 'AND' 'OR' and 'NOT' to restrict elements within a search. This allowed the initial search to be refined and restrict identified articles by publication year if deemed necessary. To ensure that this tool was implemented correctly, McGowan et al. (2016) implemented recommendations was considered as this provided an opportunity to assess if the elements effectively addressed the search terms and correctly combined with the Boolean operators. In the current study, it was deemed necessary to restrict publication year to publications from 2010 to 2021 as this allowed an opportunity to gather insights from the past decade of research and ensure that the research is contemporary.

The initial search focused on identifying articles about relevant studies focusing on effective forms of OUD treatment and the different forms of pharmacological

approaches utilized. This saw the use of key terms including 'opioid use disorder' 'suboxone' 'buprenorphine' 'naloxone' 'rehabilitation' and 'pain relief'. The search allowed some articles to be identified, of which furthermore detailed searches were developed, as demonstrated in figure 2, which includes the relevant screening process and selection criteria applied. To ensure that high-quality articles were included in the study, the critical appraisal skills program tool (CASP) was employed to critique the identified studies. The CASP tool has received extensive praise in the literature due to its ability to highlight the strengths and limitations and if it is deemed to be methodologically sound. Therefore, this justifies its inclusion within the current study.

Following the search strategy, prominent themes emerged relevant to the research question regarding effective detoxification protocols, which led to several discussions regarding the benefits of the programs and the most effective treatment moving forward. The theme will be discussed and debated in the following sections, with key questions highlighted that can be addressed in the present study. To begin, discussions will be held regarding the literature stance on effective detoxification protocols from across the globe and what this means for practitioners.

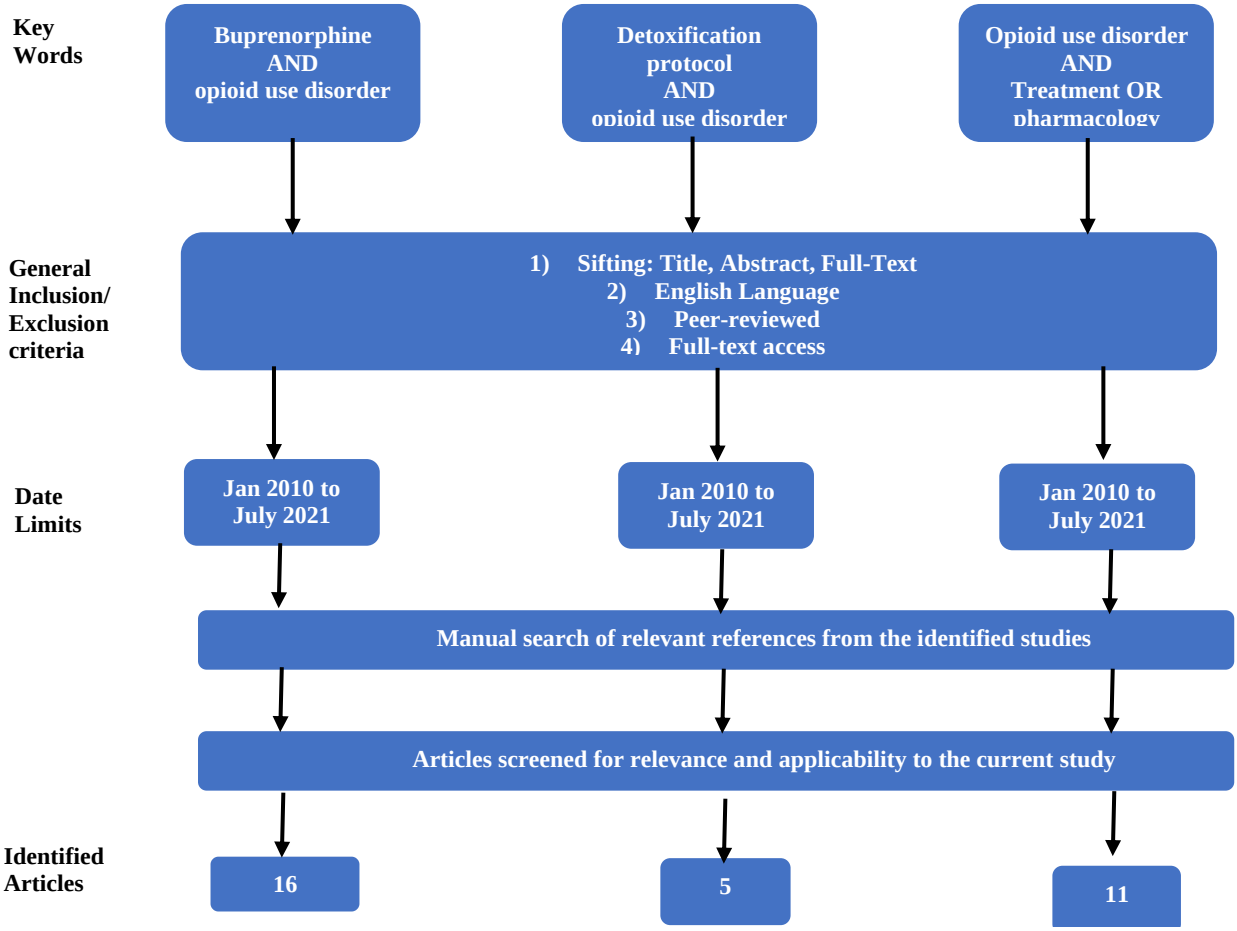


Figure 2. ***The Literature Search Strategy and Process***

2.2 Effective detoxification protocols

As the current study is interested in detoxification protocols, its first key to consider what a detoxification protocol refers to and what this may look like in practice. The World Health Organization (WHO) (2006) defines detoxification as a process whereby opioid drugs are eliminated from dependent opioid users safely and effectively to minimize the withdrawal symptoms. Providing such processes in opioid users may see the usage of the same drug or another opioid in reduced doses and may also be supported by further medications to help manage the other withdrawal effects (Diaper et al., 2014; Sigmon et al., 2012). Through this approach, the initial stage of detoxification is achieved through abstinence, whereby the aim is primarily to provide symptomatic relief from withdrawal while eliminating physical dependence on opioids (Day & Strang, 2011; Vaughan & Kleber, 2015). Detoxification is essential to effective rehabilitation from OUD and should be readily available to patients, with many studies initially exploring the benefit of in versus out-patient programs.

2.2.1 In-patient versus Out-patient

The benefit of in-patient versus outpatient care for SUDs is largely believed to be central to the patient's needs (Nicholls et al., 2010; Brady et al., 2016). In this matter, studies have found that patients with high psychiatry severity or a poor social support system are likely to experience improved outcomes in in-patient facilities compared to outpatient. While in-patient care can lead to increased treatment costs (Baser et al., 2011; Lynch et al., 2014), studies have found that this may improve long-term treatment effectiveness and reduce early treatment failures (Dreifuss et al., 2013; Dayal & Balhara, 2016).

Previously, Aghakhani et al. (2017) explored the experiences and perceived social support amongst sixteen opioid-dependent males receiving methadone syrup substitution therapy. The study found that the three key factors that led to successful recoveries lied in the family's involvement, the environment, and the support the patient needed to overcome their addiction. As noted, social support is key to support improved chances of treatment adherence and success due to increased engagement levels and more willingness to recovery (Kelly et al., 2010; Nebhinani et al., 2013). While it has been well documented for decades of the key role social support plays in the recovery of an addict, previous studies have begun to explore the impact this can further have on addicts

entering treatment willingly and engaging in the program (Zhou et al., 2017; Cooper & Nielsen, 2017). Such views were supported by Liu et al. (2018), who investigated drug use abstinence intentions in 3,239 drug users in China. The study found that family support had a positive influence on the willingness to seek and choose abstinence, although this was not as strong as the role of support from friends. While this does not directly suggest that all addicts will have support from both family and friends, but rather when the support is noticed, support from friends typically has a greater impact on intentions and willingness to adhere to treatment protocols and abstinence intentions. One possible explanation for this impact was suggested by Liu and Duan (2015), who noted that while most families would not support drug use, they would do little to prevent its use and at times would be a financial supporter of the behavior. However, this further must be considered on an individual basis as some individuals may lack either or both friends and family support which would then place further dispute into the benefit of social support in in-patient treatment.

From an experience perspective, further studies have investigated the importance of social support in effectively support patients to adhere and abstain from drug use. In Akdağ et al. (2018), investigated the impact of internalized stigma on treatment motivation, perceived social support, depression and anxiety levels in 166 heroin addictions in an outpatient setting and found that internalized stigma scores were positively correlated with both treatment motivation, anxiety and depression, as well as demonstrating a negative correlation with perceived social support. Such findings would reiterate that of previous studies whereby a lack of social support is likely to lead to continued failed abstinence attempts (Livingston & Boyd, 2010; Chou et al., 2013). However, it is important to understand that outpatient programs do not necessarily mean that there is lack of social support versus in-patient. In 2014, McCarty et al. explored the current evidence of the impact of intensive outpatient programs noted that such programs are as effective as in-patient programs but may be more appropriate for individuals with disorders who do not require detoxification or 24-hour supervision. Instead, these programs are more focused on establishing psychosocial support while facilitating relapse management and the development of coping strategies. Therefore, as the current study is focused on effective detoxification protocols, a focus will now be moved predominantly to in-patient programs.

2.2.2 Detoxification Protocols

Schuckit (2016) investigated the variety of treatments available to address OUDs and focused on pharmacological approaches. In the review, the focus was placed on the medications clonidine, benzodiazepine, temazepam, diazepam, loperamide, naproxen, prochlorperazine and ondansetron. The literature has previously noted two predominant forms of detoxification protocols utilized in practice: Buprenorphine/naloxone and methadone. The use of buprenorphine and methadone is recommended by the National Institution of Health and Care Excellence (NICE) (2019) as a first-line treatment in opioid detoxification program whereby considerations are given to whether the service user is receiving maintenance treatment with either medication and if the service user is, then the detoxification should be started with the same medication. Therefore, it is key to understand the effectiveness of these interventions and their impact on treatment outcomes and meeting the patient's needs.

2.2.2.1 Buprenorphine/naloxone

Alongside methadone, Buprenorphine has long been noted with effective treatment for opioid management and has often been associated with various individual and societal benefits. Buprenorphine known as a synthetic opioid synthetic analogue of Thebaine, an alkaloid compound derived from the poppy flower. The use of Buprenorphine to support OUDs is based on the ability it provides the patient to focus on their treatment and therapy rather than the withdrawal symptoms and discomfort. While the patient is likely to experience some discomfort during this time, it is much lower than cold turkey. Further, the use of Buprenorphine allows a reduction in cravings and helps to improve the patient’s quality of life during rehabilitation. Studies have found that Buprenorphine can be effective in engaging medically hospitalized patients who are not actively seeking addiction treatment and can support reductions in illicit drug use. In 2014, Liebschut et al. found that buprenorphine administration during medical hospitalization led to decreased illicit opioid use and increase engagement in rehabilitation in 139 patients, it found that patients who were in the buprenorphine opioid agonist treatment group were more likely to engage in rehabilitation and have reduced illegal opioid use at 6-months following hospitalization. Such findings have been similar in further studies (Stein et al., 2020; Blondell et al., 2010), suggesting that the use of Buprenorphine is effective to support detoxification from opioids.

2.2.2.2 Buprenorphine protocol

A classic buprenorphine detoxification process takes between 7 to 10 days (Plunkett et al., 2013). When consulting NICE (2021) guidance for maintenance treatment, the guidance changes depending on whether a patient is withdrawing from heroin or methadone. Firstly, the guidance notes that for heroin users, the patient should be started on a low dose and titrate rapidly to prevent dropout. This sees an initial treatment of 4 mg on the first day, which then increases to 8 to 16 mg on the second day and for the remaining treatment program and may be divided during the day to reduce precipitated withdrawal. Secondly, when switching from methadone, the guidance notes the importance of delaying the initial dose of Buprenorphine until the patient is experiencing withdrawal symptoms. Further, the dose of methadone should be reduced to less than 30 mg/day or less and is recommended to be achieved by reducing the dose by 5 mg every one to two weeks. In cases where opioid cravings during withdrawal are experienced, Ahmadi et al. (2018) conducted an investigation into a single high-dose buprenorphine for opioid craving during withdrawal in patients over five days of abstinence in ninety men with OUD. The study found that the administration of a single, sublingual dose of Buprenorphine at either 32, 64 or 96 mg each led to decreased cravings. More specifically, the study found that the administration of a higher dosage (96 mg) had the greatest difference in craving score, which saw a deterioration from baseline of 7.56 to 0.00 at day five, which was lower than both 64 mg; baseline 6.93 to 0.10 day five; and 32 mg; baseline 7.23 to 0.70 at day five. More recently, Ahmadi et al. (2020) investigated the impact of a single dose of Buprenorphine on reducing opioid cravings and suicidal ideation in sixty-one OUD patients. The study separated the participants into three groups: 16 mg, 32 mg and placebo. The study found that both experimental groups were significantly different to the placebo group in terms of craving reductions, with the maximal effect achieved in the 16 mg dose, with the 32 mg found to have a maximal effect on suicidal ideation. In this sense, a single high dose at 16 mg or 32 mg both support reductions in opioid craving, but the higher dosage can also reduce suicidal ideation. More specifically, 16 mg reduced from 9.85 to 0.00 by day three and continued into day 4, while 32 mg had reduced to 1.70 from 9.10 on day 4. Such findings have been demonstrated in a range of further studies, highlighting the benefit of Buprenorphine as an effective detoxification process due to its ability to reduce opioid cravings (Rosenthal et al., 2016; Northrup et al., 2015; Dunn et al., 2015).

2.2.2.3 Use the combination of Buprenorphine/naloxone

While beneficial when used solely, there is a growing evidence-based suggesting the use of Buprenorphine and naloxone (Suboxone), as Naloxone is a partial agonist at mu-opioid receptors and an antagonist at delta- and kappa-opioid receptors and, when used with Buprenorphine, can help to stimulate the kappa receptors without stimulating the opioid receptions. This is believed to be an effective manner of decreasing drug use without leading to opioid dependence. As such, this has led to the frequent usage of Suboxone tapers to succeed opiate withdrawal over a shorter duration, usually three days, which has been noted as an effective approach to assisting recovery from OUD (Perry & Taylor, 2021).

Previous studies have reported that using a combined approach can have several benefits, including reductions in illicit opioid use, enhanced engagement in treatment and reduced use of rehabilitation treatments (D'Onofrio et al., 2015; Shcherbakova et al., 2018; Yokell et al., 2011). However, some studies have argued that while pain and discomfort are supposed to be minimal during the detoxification period, this is not always the case. Potter et al. (2010) conducted a secondary analysis from data from two clinical trial network randomized controlled trials of buprenorphine-naloxone to investigate the extent that pain was associated with continued opioid use during and following a 13-day detoxification protocol. The study found that more severe pain and pain inference were associated with opioid use 30 days before follow-up. Further, the study reported that patients who experienced moderate to severe pain at the start of detoxification were associated with treatment success post-detoxification, which may suggest that these patients may have already been experiencing or had experienced withdrawal symptoms prior to detoxification which may have led to an increased level of motivation to remain in the detoxification.

2.2.2.4 Buprenorphine and naloxone (Suboxone) benefits

The use of Suboxone has been found to be beneficial, as according to Steele and Cunningham (2012), suboxone therapy reduces the risk of premature termination of the detoxification process compared to other medications such as clonidine. Further, Tanner et al. (2011) found that patients who were prescribed Suboxone experienced more clarity of thinking compared to those on methadone. However, the study noted that such increases in clarity of thinking tended to require a greater level of psychosocial

therapeutic support than methadone, suggesting that the increased clarity was not necessarily associated with Suboxone. Further, the study noted that Suboxone led to increased confidence and lower levels of stigma than methadone, suggesting that Suboxone may also support engagement levels from patients.

2.2.2.5 Initiating Buprenorphine and naloxone (Suboxone) protocol

Plunkett et al. (2013) suggest that Suboxone should be given in the lowest dose possible in terms of dosage. When consulting the guidance from NICE (2021), it is recommended that Suboxone is initially given a dosage of 4mg, which can be repeated twice on the first day depending on the patient's needs, with the following dosage adjusted according to the patient's response. This should be given as either a weekly dose divided and given on alternate days or can be given three times weekly, with a maximal daily dosage of 24mg. Previously, Katt et al. (2012) investigated the use of Suboxone as an opioid substitution therapy in twenty-two OUD patients. The study reported that COWS reduced from day one (8.1) to day thirty (4.2), with 95% of participants completing the taper phase. On the first day of the taper, subjects were provided with a suboxone dosage ranging from 4 to 8 mg, ranging from 8 to 16 mg, during the remaining taper days. Such findings demonstrate the benefit of a low-dose maintenance model. Such dosages are similar to those prescribed in previous studies, with studies such as Furst (2013) range from 8 mg to 24 mg.

2.2.2.6 Buprenorphine and naloxone (Suboxone) vs. other medications

Further studies (Blanco & Volkow, 2019; Haight et al., 2019; Connery, 2015) have noted that the use of other medications such as morphine for OUDs has been vigorously explored in the literature, which has led to the view of morphine as an effective treatment option. While some studies have suggested that the use of methadone is a superior treatment to morphine (Davis et al., 2018), this has been debated continually in the literature. Further, some studies have often viewed Buprenorphine as a more effective alternative to morphine due to the impact this has on treatment outcomes. Compared to morphine, Buprenorphine is a potent but partial agonist of mu-opioid reception, which shows a high affinity but low intrinsic activity. High potency and slow off-rate support Buprenorphine displaces other mu agonists such as morphine from receptors and overcomes opioid dependence issues (Virk et al., 2009). Studies have shown that Buprenorphine is an estimated 25 to 100 times more potent than morphine, and due to its

slow dissociation from mu receptor, this leads to a prolonged therapeutic effect which treats opioid dependence as well as the pain experienced (Khanna & Pillariseti, 2015).

As such, this does not dispute the effectiveness of morphine compared to other medications, but rather than the literature appears to suggest that Buprenorphine is more effective. In 2018, Klimas et al. investigated the effect of slow-release oral morphine versus methadone for the treatment of OUD. The study collected data from 471 trials and found that while no significant differences were present between the approaches in terms of improving treatment retention and opioid use, data showed that improved retention is possible through morphine as previous studies have questioned methadone use for adherence which increases mortality risk (Sordo et al., 2017; Larochelle et al., 2018). Further, this improved retention and benefit of morphine has been shown in further studies, reiterating the benefits it provides in detoxification from OUD.

As such, the literature has also emphasized the benefit of using Buprenorphine compared to methadone. This has led to Buprenorphine being identified as having many therapeutic advantages compared to methadone, including reduced risk of overdose-related death, increased portability, and improved safety profile (Timko et al., 2016; Ma et al., 2019). In 2019, Whelan and Remsk, reviewed the impact of both buprenorphine and methadone treatment found that while in many areas, Buprenorphine has not overtaken methadone in managing opioid addiction, but Buprenorphine is considered the safer agent. Further studies have noted that both Buprenorphine and methadone are considered more effective detoxification treatments compared to other medicines such as clonidine and lofexidine (Meader, 2010; Vaughan & Kleber, 2015; Law et al., 2017)

On the other hand, studies have noted that Suboxone can exacerbate pain symptoms or induce withdrawal independent individuals, which is a potential limitation (Dugosh et al., 2016; Burma et al., 2017). Never the less, the rehabilitation centers' effectiveness of detoxification treatment protocols is of key consideration to understand if they effectively support successful recovery from OUDs. As such, the current study will investigate the benefits of Suboxone on opioid withdrawal and pain in OUD patients.

2.3 Chapter Summary

The current chapter has found that although the use of buprenorphine either solely or in combination with naloxone (suboxone) has been found as an effective treatment; there remains limitation use in some areas due to the cost-effectiveness of other treatments

such as methadone. However, as the chapter has discussed, several benefits of utilizing suboxone are compared to other approaches, which emphasizes the potential benefits and clinical relevance it can provide to enhance opioid dependence treatment. Due to the lack of understanding and insights available relating to such use in MENA, the known information must be implemented into a study investigating OUD treatments in such areas to understand if this approach may be more beneficial.

Chapter 3. METHODS

The primary focus of chapter three is to provide clear insights into the chosen methodological approach and ensure that transparency and clarity are provided. The selected methodological approach will support the achievement of the study's aims and objectives and provide a rationale and explanation for how this is met. The chapter will provide details relating to the subjects and sampling, data collection and analysis and the measures utilized during the study. Further information will be provided relating to ethical considerations and the intended dissemination plan.

3.1 Study Design

The current study adopted a retrospective case-note review based on patient's date at a single center based in Dubai, UAE and was predominantly exploratory in nature. The study was conducted in Erada Center for Treatment and Rehabilitation, a facility that aims to treat SUDs and alcohol addiction. The center is a Government of Dubai service providing addiction treatment and rehabilitation services, provides increased awareness of SUDs, and supports scientific research in addiction.

While research designs such as randomized controlled trials (RCTs) are often perceived as being the gold standard and have been implemented to support further advancements in SUD and OUD research (see. Jaffe et al., 2021; Bowen et al., 2014; Mueser et al., 2013), it was deemed that this was not suitable in the current study. Such decisions were reached following the need to collect data from participants who consent and withstand the treatment duration. However, due to the impulsive behavior of many addicts and their ability to withstand withdrawal of their addiction, the time limits were challenging in this period which may have led to an inadequate sample size being achieved.

Therefore, using the adopted research design provides an opportunity to gain a mass of data with a small impact on both financial and time restraints. This methodology was relevant to the exploratory nature of this study, allowing data to be generated to guide future sample size calculation and clarification of hypotheses (Hess, 2004). Several limitations are associated with retrospective design, including information and confounding bias; these will be discussed later (Healy & Devane, 2011) and further limitations of the methodology identified post-data collection.

3.1.1 Schematic of Study Design

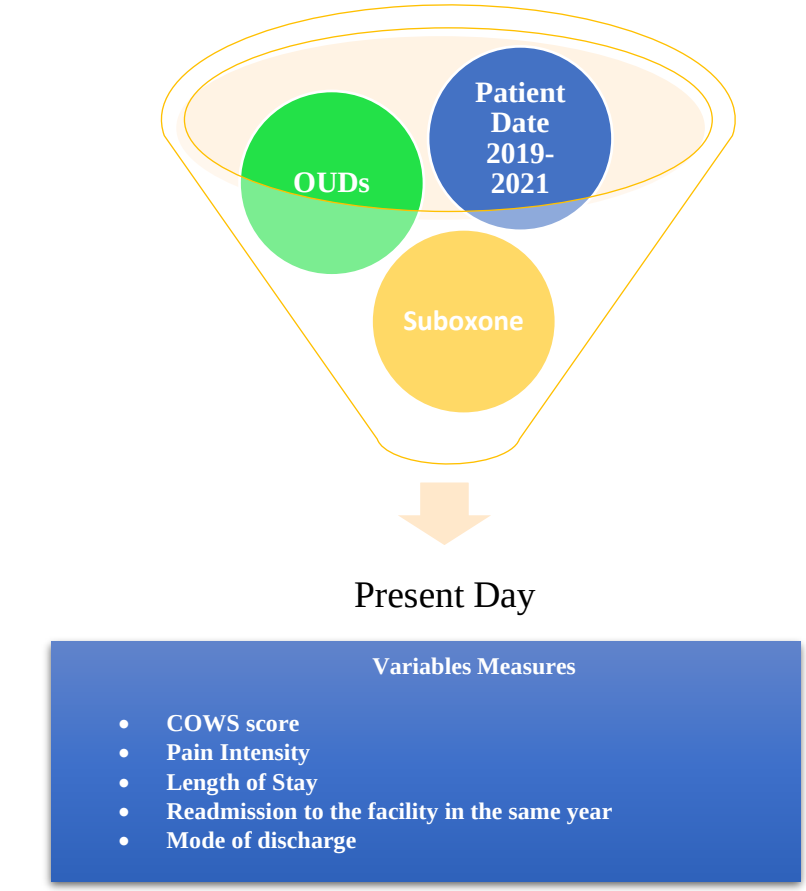


Figure 3. ***The schematic of the study design***

3.2 Sampling

The sampling frame was patients who had received treatment at the Erada center, based in Dubai, UAE. While the Erada Center offer both in-patient and outpatient programs and partial programs, the data were sampled from the in-patient program only as this was deemed the most appropriate for the current study. The decision to have a minimal timeframe is based on the need to reflect current practice and to reduce the potential impact of previous best practices or protocols used within the institution.

3.2.1 Sampling Strategy

The intervention group was determined by those that had received the suboxone protocol compared against those who had not. The current study conducted a retrospective

review of medical records of patients with OUD who had received inpatient treatment in the Erada center from January 2019, and recruitment was stopped when 200 files were collected. This timeframe was selected as it allowed more recent subjects who have been treated under similar protocols and approaches to be selected in the study when fulfilling the inclusion criteria identified by the primary researcher, adding to this it allowed the current practice to be reflected.

3.2.2 Sample Size

Due to time limitation, it was not possible to access all data available. Therefore, it was determined using a sample size calculator that a sample of 200 subjects would allow for a worthy insight into the effect of the intervention. This was calculated using the formula (Pourhoseingholi, et al., 2013);

$$\frac{\frac{z^2 \times p(1-p)}{\mathrm{e}^2}}{1 + \left(\frac{z^2 \times p(1-p)}{\mathrm{e}^2 N}\right)}$$

Whereby N is the population size, e is the margin of error presented as a percentage in decimal form, and z is the z-score. The population size available for the entire study was 416, and the application of a 95% confidence level and a margin error of 5%, the sample size was calculated at 200.

3.2.3 Selection Criteria

To be determined as appropriate for use within the study, subjects were required to be as:

A- Inclusion criteria:

- above 18 years of age,
- Be an opioid user, with or without amphetamine/methamphetamine, cannabis or pregabalin use.

B- Exclusion criteria:

- Any subject who was identified as primarily alcohol, benzodiazepine user
- Or with comorbid psychiatric condition was deemed irrelevant for the present study.

This criterion was developed around the researcher's clinical experience and considering the external factors that may impact the results of the study. These focus on providing homogeneity but provided opportunities for the sample to represent the wider population.

3.2.4 Recruitment Scheme

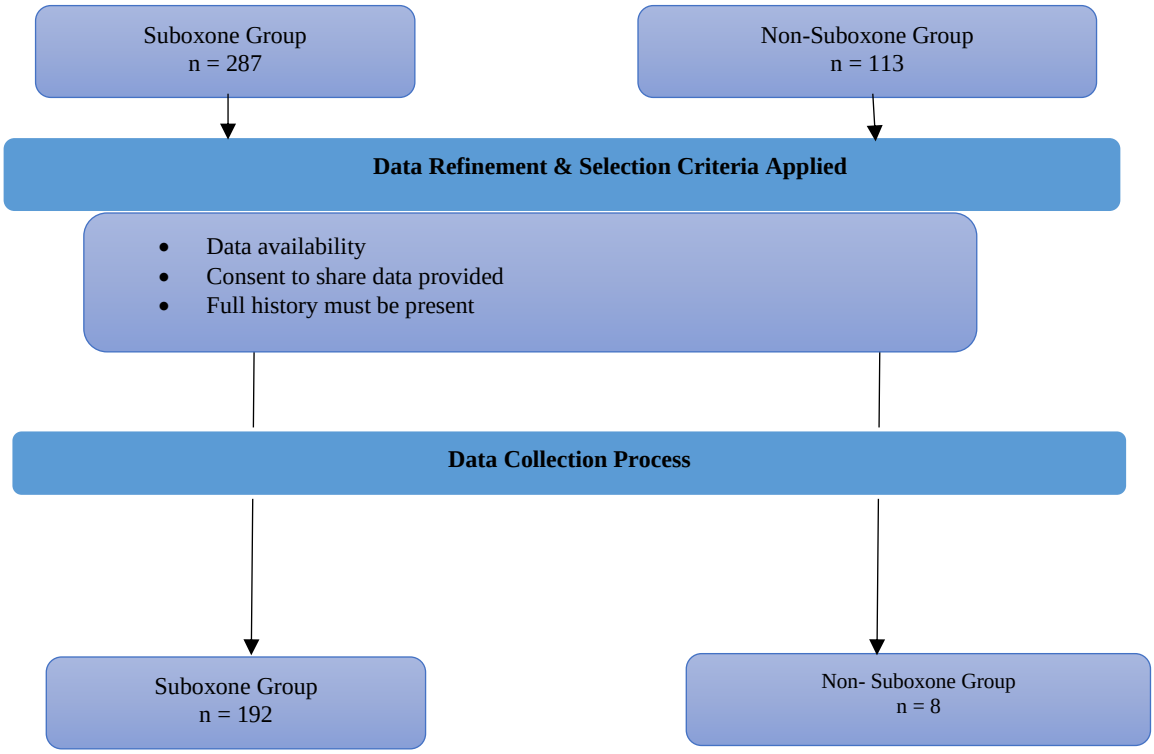


Figure 4. ***The Schematic of the recruitment process and the group sizes. The data refinement saw the sample reduced to the first 200 cases.***

3.3 Data Collection

Several forms of data were collected during the study, which provided several forms of variables that supported the ability to respond to the respective research questions and the hypotheses. Therefore, it is key to understand what these variables are and why they were collected.

3.3.1 Variables

The study collected three forms of variables: baseline and demographic, independent and dependent variables.

3.3.1.1 Baseline Characteristics

Baseline and demographic characteristic were collected from pre-treatment scores recorded from each of the patients. This provided an opportunity to compare the figures and scores recorded prior to the intervention to understand if it was effective. An overview of the baseline and demographic variables can be seen in table 1 and table 2.

Table 1. ***Subject Frequency data***

	n	%
Gender		
Male	**184**	**92**
Female	**16**	**8**
Nationality		
UAE	**181**	**90.5**
Comoros	**6**	**3**
Bahrain	**5**	**2.5**
KSA	**3**	**1.5**
Omani	**2**	**1**
Yemeni	**2**	**1**
Kuwaiti	**1**	**0.5**
Marital Status		
Single	**123**	**61.5**
Married	**77**	**38.5**
Level of Education		
Secondary Edu	**87**	**43.5**
Preparatory Edu	**52**	**26**
Primary Edu	**35**	**17.5**
Bachelor Degree	**18**	**9**
Diploma	**8**	**4**
Mode of Discharge		
DAMA	**132**	**66**
Regular	**68**	**34**
Readmission in same year?		
Yes	**88**	**44**
No	**112**	**56**

Table 2. ***Descriptive statistics. Representing mean and stander deviation of participant age. Mean and stander deviation of COWS in day 1, 2, 3, and week 2.***

	Mean±SD
Age	**31.99±7.75**
COWS Day 1	**10.01±4.72**
COWS Day 2	**10.33±4.84**
COWS Day 3	**6.48±3.53**
COWS 2 Week	**2.97±2.37**

Table ***3 Descriptive statistics. Representing mean and stander deviation of pain score in day 1, 2, 3 and week 2. And m. Mean and stander deviation of length of stay***

	Mean±SD
Pain Score Day 1	**1.97±2.24**
Pain Score Day 2	**2.37±2.18**
Pain Score Day 3	**1.84±2.11**
Pain Score Week 2	**0.44±1.31**
Length of stay days	**14.30±8.63**

3.3.1.2 Independent Variables

The intervention focused on the use of a suboxone protocol in OUD patients compared to non-suboxone protocols in the population sample. Therefore, several independent variables were collected to allow an understanding of any variation in data

present which may help to explain the results. Therefore, the collected independent variables included:

- If suboxone protocol had been received
- If PRN medications had been received for either pain relief or insomnia

3.3.1.3 Dependent Variables

The intervention focused on the use of a suboxone protocol in OUD patients compared to non-suboxone protocols in the population sample. Therefore, variables which measured the impact of the suboxone protocol allowed this to be assessed. The collected dependent variables included:

- COWS scores for the first three days and at 2 weeks
- Pain intensity score for the first three days and at 2 weeks
- Length of stay
- Mode of Discharge
- Readmission to the facility in the same year

3.3.2 Data Collection Tools

All data were initially compiled onto a Microsoft Excel spreadsheet in preparation for data analysis using the Statistical Package for the Social Sciences (SPSS) v.24. An electronic approach was deemed the most appropriate due to its superiority in reducing input error and allowing easier centralization and access to the data (Gearing et al., 2006). As the data was extracted from a source whereby it was previously collected for alternate purposes, the researcher was reliant on the initial recorder for accurate recording. Therefore, information bias is of particular concern in the current study, and the inherent reliability and validity of the data are unknown (Gearing et al., 2006). Therefore, to reduce such bias, a standardized and clear data abstraction sheet was used, alongside a coding manual (Jansen et al., 2005). The coding manual described each variable and how it should be captured, ensuring consistency. The current study utilized two predominant measures to collate data: COWS and pain intensity.

3.3.2.1 COWS

The COWS is an 11-item questionnaire that assesses the signs and symptoms of opioid withdrawal observed or measured. The withdrawal signs and symptoms are

directly observed by a nurse, which includes increased resting pulse rate, gastrointestinal upset, sweating, and tremor as based on outstretched hands, restlessness, yawning, pupil size in terms of dilation extent, anxiety, irritability, arthralgias, piloerection of skin and either a runny nose or tearing that is not related to cold symptoms or allergies. Individuals who score higher are indicative of greater withdrawal symptoms (Nielsen et al., 2014). The use of the COWS score for opiate withdrawal can be justified due to its extensive use in practice and additional studies validating its reliability and validity to measure opiate withdrawal (Tompkins et al., 2009; Wesson & Ling, 2003). The COWS score ranged from 0 to 48, and an overview of the score chart can be seen in table 3.

Table 4. ***The COWS score chart***

Grade	Score
Mild	**5-12**
Moderate	**13-24**
Moderately Severe	**25-36**
Severe Withdrawal	**>36**

3.3.2.2 Pain Intensity

The measurement of pain intensity was adapted from AbuBaker et al. (2019), which utilized an 11-point Likert Scale. The scale uses a self-report measure that asks subjects to indicate their pain level from 0-10: 0 = no pain, 1-3 mild pain, 4-6 moderate pain, 7-9 severe pain, and 10 the worst pain imaginable. Similar to the AbuBaker study, no subject data or any form of identification was included on the form, and this provided an opportunity to ensure that confidentiality and anonymity of data were maintained.

3.3.3 Pseudonymization

When data collection began, all data was pseudonymized at the point of collection to ensure that anonymity was preserved. As previous studies have highlighted, pseudonymization is more appropriate than anonymization due to the ability to re-identify individuals (Kushida et al., 2012). This has led additional researchers to suggest that utilizing a linking database between the clinical data and the identification database can effectively support this process (El Emam et al., 2006; Kalra, 2006). Such processes allow identifiable data to be separated from substantive data by providing a link between an arbitrary code which in the current case saw the application of the code ‘S ###’ such as

'S 001'. This allowed the identification of the participants to be hidden while allowing the primary researcher to understand which data belonged to which patient.

3.4 Data Analysis

The current study conducted descriptive and frequency analysis utilizing SPSS v.24 software (IBM, Chicago, IL, USA). This allowed data relating to the demographics, pre-and post-intervention data, and clinical data to be studied. This included the calculation of mean, standard error and proportions were used to express central tendency and the interquartile range as a measure of the variability of the data. The current study conducted a Wilcoxon signed-rank test to compare the scores pre-and post-treatment for both COWS and pain intensity to address the initial two hypotheses. To address the third hypothesis, the current study conducted a Chi-Square test of independence to understand the relation between suboxone protocol and PRN administration and treatment completion rate. The alpha was set as $\alpha = 0.05$, and 95% confidence intervals were displayed. A series of bivariate correlations were also conducted to identify any associations between the variables.

3.5 Ethics

The current study required all participants to provide informed consent, which was gained at the time of admission to use data for research purposes; this prevented the need for further consent. All data was handled in accordance with the relevant data protection acts, and all participants were provided with a code name to preserve anonymity and confidentiality. The collection, storage, use and disclosure of research data must comply with the Data Protection Act (1998); inappropriate data protection and breaches in confidentiality raised potential ethical issues in the current study. The Data Protection Act has established principles and table 4 presents how compliance was achieved in the current study. The Data Protection Act (1998) and the Common Law Duty of Confidence stipulate that data should be handled in de-identified forms to prevent potential data leaks or individuals without permission accessing personal data (Department of Health, 2003). Furthermore, the RGF also states that attention must be given to systems for ensuring confidentiality. As discussed, all personal information was pseudonymized. The personal data and code numbers were stored on a secure password-protected computer, and the coded data held separately on a secure work password-protected computer. Only the primary investigator had access to both data sets.

The current study received approval from the Dubai Medical College Ethics Committee and Erada Center. The study followed all the relevant DHA approval procedures. The International Conference of Harmonization Guideline for Good Clinical Practice (GCP) and the Research Governance Framework for Health and Social Care (RGF) are ethical and scientific quality standards for designing, conducting, recording and reporting trials with human subjects (ICH, 1996; Department of Health, 2005). These key frameworks encompass research using identifiable data; hence they have been adhered to in the course of this project.

Table 5. ***The compliance to the Data Protection Act 2018***

Principle	Application in Study
Data should be processed fairly and lawfully	**All collected personal data was collected by a lone researcher. Identifiable data was stored in accordance with the legislation.**
Data only obtained for specified and lawful purposes	**Exemption under section 33.** **Specific data collected included demographics, characteristics and clinical data necessary to assess the impact of suboxone protocols on OUD**
Data should be adequate, relevant and not excessive	**Data relevant and necessary. Personal data limited and pseudonymized**
Data should be accurate and kept up to date	**Retrospective data; accurate at time of recording. Data limited.**
Data should not be kept for longer than is necessary	**Identifiable data to be stored for 15 years – in line with local policy.** **Non-identifiable data to be stored on a secure computer for 5 years.**
Data shall be processed in accordance with the rights of data subjects under this Act	**All data was pseudonymized.** **Minimal amount of personal data utilised**
Data should be kept secure by means of technical and organizational measures	**Personal and pseudonymized data stored separately on a secure device accessible only by the researcher.** **Encrypted memory stick to transport pseudonymized data off site.** **Computers situated in locked offices.**

3.6 Dissemination Plan

Following the completion of the study, it is key that a dissemination plan is developed to ensure that the research findings can be dispersed and made available to those it can benefit the most. Dissemination of research findings is a key requirement of the RGF and has previously been acknowledged by the Research Council UK Policy and Guidelines on Governance of Good Research Practice (Department of Health, 2005; RCUK, 2013). In terms of the current study, the dissemination plan will see the provision of an executive summary, publication in a peer-reviewed journal and presentation to relevant health bodies and facilities concerned with OUD rehabilitation and treatment on a national and international level. This will allow the awareness and understanding of the research findings to be enhanced while also supporting future collaborations, providing recommendations for best practices, and informing future research studies.

3.7 Chapter Summary

The current chapter has effectively depicted the main aspects of the current studies methodological approach and provided rationales for the decisions made during this period. The use of a quantitative design whereby pre-and-post data is compared can provide opportunities to gain a greater understanding of the impact of a suboxone protocol on the withdrawal signs and symptoms and pain experienced by the patients. The data collection and analysis were described, and insights into key ethical considerations held and the intended dissemination plan were discussed.

Chapter 4. RESULTS

The current chapter will provide insights into the key data from the study with further insights into how this supports the achievement of the studies aims and objectives. The chapter begins by providing data relating to the participants to ensure that a more understandable and clear image of the studied population can be gained. Following this, a focus is placed on addressing the hypotheses stated in chapter one in the relevant order. The data utilized effect sizes to determine the impact of the detoxification protocols and was interpreted utilizing Cohen's (1988) d, which views sample sizes as either small (0.2), medium (0.5), large (0.8) or very large (1.4). All raw data can be seen in the appendices.

4.1 Participant Data

The study collected data from 200 predominantly male subjects (n = 184, 92%) from the UAE (n = 181, 90.5%) with the subjects age ranging from 21-55 years (31.99±7.75). The majority of the population were single (n = 123, 61.5%) and had completed secondary education (n = 87, 43.5%). The vast majority of the sample received the suboxone protocol (n = 192, 96%) as well as receiving PRN medication for insomnia (n = 191, 95.5%) and pain (n = 156, 78%). The initial COWS data demonstrated a wide range from day 1 (0-28, 10.01±4.72), day 2 (1-32, 10.33±4.84), day 3 (0-20, 6.48±3.53) and 2 week (0-15, 2.97+2.37). Similarly, the study noted a range of pain scores from day 1 (0-8, 1.96±2.24), day 2 (0-8, 2.37±2.18), day 3 (1.84±2.11) and week 2 (0.44±1.31) Figure 5. The length of stay ranged from 2 to 40 days (14.30±8.63) across the population. Most of the population were discharged against medication advice (n = 132, 66%) with most subjects not being readmitted within a year (n = 112, 56%).

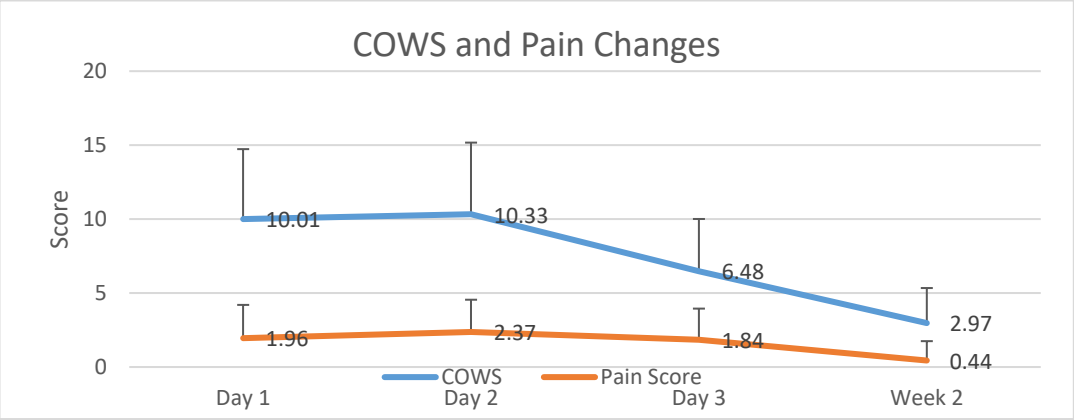


Figure 5. The changes in mean and SD of COWS and pain score throughout the data collection period. Blue line represent the COWS score, while Orange line represent pain score.

There was missing data in the collection of data from COWS and pain score throughout the trials. In terms of COWS, there was missing of 3.5% between COWS day 1 and day 2, with a further 8.1% between day 2 and day 3. The largest missing was observed between day 3 and two week (43.2%), with the total decrease from day 1 to 2 weeks was 50%.

In terms of pain score, similar missing in data were noted, although not as large. Between day 1 and day 2, the data was reduced by 17%, which was further reduced by 4.8% on day 3. The largest decrease was observed between day 3 and two week (27.9%), with the total decline between day one and two week being 43%.

4.2 Normality Testing

Normality testing was conducted utilizing a Shapiro-Wilk test (SW). The data identified a sole dataset, COWS day 2, that was deemed to be a normal distribution, $W(78) = 0.986$, $p = 0.58$. The remaining datasets being deemed to be significantly different from a normal distribution ($p > 0.05$). Therefore, the null hypothesis can be rejected in the current population with exception to the COWS day 2 dataset.

4.3 Pre vs. Post Scores

To compare pre- and post-scores for the subjects, a Wilcoxon signed rank test was conducted. Initially, the Wilcoxon test was conducted to assess the changes to COWS scores. The test showed that there was a statistically significant difference ($Z = -8.234$, $p < 0.001$) between the pre- and post-scores. The data revealed improved COWS scores in 90 subjects ($M = 49.93$), with the remaining 10 had either increased ($M = 13.90$) or remained equally the same. The effect of the suboxone protocol was calculated as 0.77, which Cohen's classification of effect sizes suggests the intervention is moderate, and borderline large. Further assessments of the additional time periods were conducted which revealed a further three significant findings. Firstly, a statistically significant difference ($Z = -10.077$, $p < 0.001$) was identified between day 2 and 3 which was deemed as a moderate effect (ES: 0.76), with a similar effect (ES: 0.73) identified during day 3 and week 2 ($Z = -7.215$, $p < 0.001$). The additional significant finding was identified between day 2 and week 2 ($Z = -8.499$, $p < 0.001$) which was deemed to have a large effect (ES: 0.85).

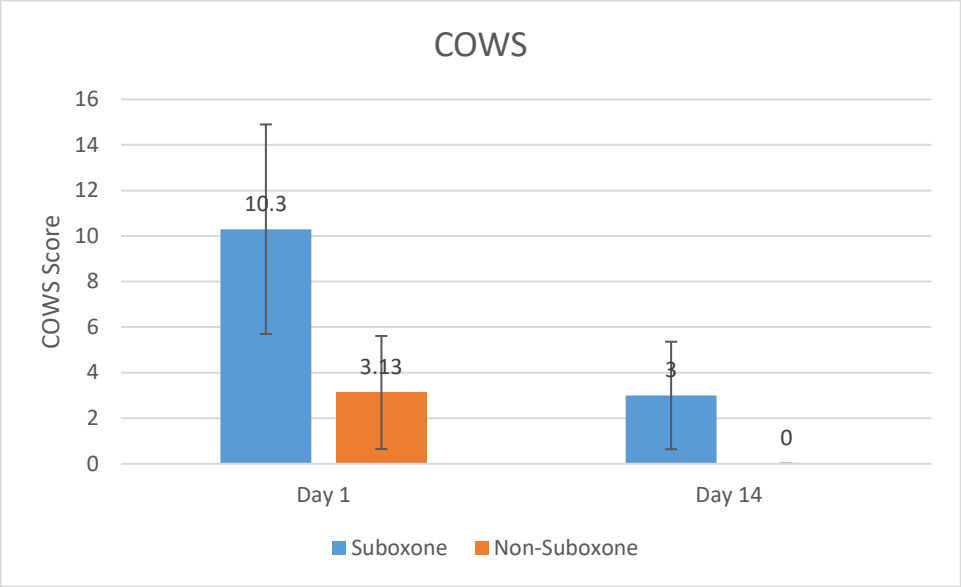


Figure 6. ***An overview of the COW comparison scores (mean and SD) between subjects who received suboxone and who did not received suboxone.***

The Wilcoxon signed rank test was further conducted to assess the changes in pain scores from day 1 to week 2. The study identified a statistically significant difference (Z = -5.413, p < 0.001) between the pre- and post-score. The data revealed that in most cases (n = 55) there was no change in the data, but there were more reductions in pain score (n = 49, M = 32.49) compared to increases in pain score (n = 10, M = 17.80). The effect size was calculated and revealed a moderate effect size of 0.54 based on Cohen's classification of effect sizes. Further assessments of the additional time periods were conducted which revealed a further two significant findings. Firstly, a statistically significant difference was identified between week 2 and day 2 (Z = -5.896, *p* < 0.001) and week 2 and day 3 (Z = -5.380, *p* < 0.001). Both of the findings were deemed to have a moderate effect (ES: 0.59, ES: 0.53, respectively).

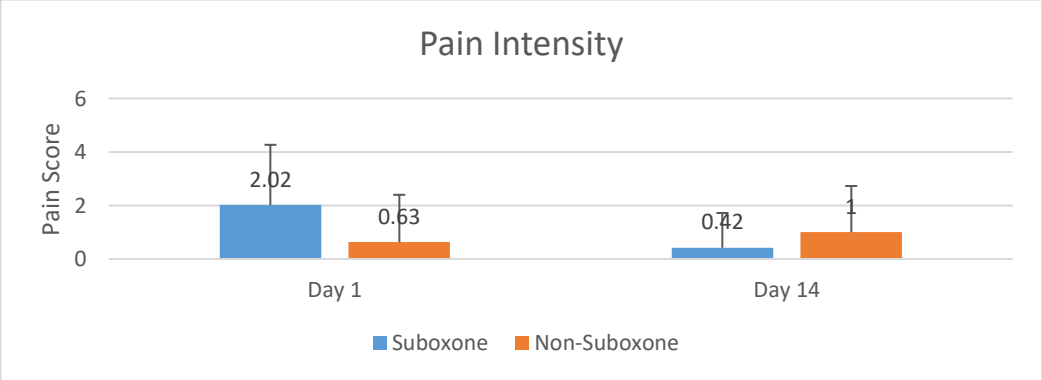


Figure 7. ***A comparison of mean and SD of pain score differences between participants who received suboxone and who did not received suboxone.***

4.4 Treatment Completion Rate

To assess the treatment completion rate, the study conducted a Chi Square test of independence to observe if the suboxone protocol was more beneficial and the benefit of the administration of PRN medication for pain and insomnia. Firstly, the chi-square test of independence was performed to examine the relation between the subjects who followed the suboxone protocol and those who had not and the completion rates of the treatment. The relation between the variables was found to be non-significant, X^2 (1, n = 200) = 0.45, p = 0.831. This suggests that the suboxone protocol was not more likely to improve treatment completion. This was further highlighted in the groups whereby those without suboxone (n = 8) were more likely to be discharged through DAMA (62.5%) compared to regular discharge (37.5%) which was similar to the statistics for those with the suboxone protocol whereby DAMA scored higher (66.1%) than regular discharge (33.9%).

A second chi square test of independence assessed the relation between the administration of PRN for insomnia and the completion of treatment. The relation between the variables was found to be non-significant, X^2 (1, n = 200) = 0.583, p = 0.445. This suggests that the administration of PRN for insomnia was not more likely to improve treatment completion. This was further highlighted in the groups whereby those without PRN (n = 9) were more likely to be discharged through DAMA (77.8%) compared to regular discharge (22.2%) which was similar to the statistics for those with the suboxone protocol whereby DAMA scored higher (65.4%) than regular discharge (34.6%).

A third chi square test of independence assessed the relation between the administration of PRN for pain and the completion of treatment. The relation between the variables was found to be non-significant, X^2 (1, n = 200) = 1.200, p = 0.273. This suggests that the administration of PRN for pain was not more likely to improve treatment completion. This was further highlighted in the groups whereby those without PRN (n = 44) were more likely to be discharged through DAMA (59.1%) compared to regular discharge (40.9%) which was similar to the statistics for those with the suboxone protocol whereby DAMA scored higher (67.9%) than regular discharge (32.1%).

4.5 Bivariate Correlation

All collected variables were analyzed for correlations between the data including those which are demographic or baseline data and the remaining data collected throughout the study. To ensure clarity and transparency in the presentation of the data, the following sub-section will be divided into sections that outline identified correlations in demographics, baseline and measured data.

4.5.1 Baseline Characteristics Correlations

Data pertaining to the subjects' baseline and demographic data was initially checked for the presence of a correlation. This included data relating to age, gender, marital status and education level. Firstly, subject age was found to have a positive very weak correlation with COWS day 2 ($r = 0.258$, $p < 0.001$) and COWS day 3 ($r = 0.222$, $p = 0.003$). Similar results were identified for participant gender which was found to have a positive very weak correlation with COWS day 1 ($r = 0.153$, $p = 0.030$) and a negative very weak correlation with pain score at 2 week ($r = -0.228$, $p = 0.014$). There was no additional significant correlations identified for any further baseline or demographic characteristic.

4.5.2 COWS correlations

The COWS data saw the greatest number of significant associations with the collected data with the strength of the correlations ranging from very week to moderately strong. Firstly, COWS day 1 was found to have a positive weak correlation with pain score day 1 ($r = 0.266$, $p < 0.001$).

COWS day 2 had several significant correlations although these were classified as being either very weak with pain intensity day 1 ($r = 0.158$) and day 3 ($r = 0.191$, $p = 0.016$), or a weak correlation as found with day 2 ($r = 0.288$, $p < 0.001$). Further correlations with COWS day 2 were found with COWS day 3 which was deemed to be a moderately strong correlation ($r = 0.590$, $p < 0.001$) and a negative weak correlation with length of stay ($r = -0.219$, $p = 0.002$).

COWS day 3 was found to be similar to the results from COWS day 2 whereby a series of weak correlations were identified with pain intensity day 1 ($r = 0.211$, $p = 0.005$), COWS week 2 ($r = 0.286$, $p = 0.004$), pain score day 2 ($r = 0.248$, $p = 0.002$), pain score

day 3 (r = 0.258, p = 0.001) and a negative weak correlation with length of stay (r = -0.214, p = 0.004).

COWS week 2 was found to have two positive weak correlations with pain score day 3 (r = 0.231, p = 0.030) and pain score at 2 weeks (r = 0.297, p = 0.004).

4.5.3 Pain Intensity Correlations

In addition to the correlations with COWS and baseline characteristics above, pain scores had a further three correlations that were deemed as either very weak or weak. Firstly, pain score day 1 was found to have a positive very weak correlation with pain score day 2 (r = 0.184, p = 0.017). Both pain score day 2 and pain score day 3 (r = 0.267, p = 0.001) and pain score day 3 and pain score week 2 (r = 0.228, p = 0.021) were deemed to have positive weak correlations.

4.5.4 Additional Correlations

In addition to the above correlations, further correlational analysis was conducted on the consumption of PRN medication for insomnia and pain as well as the consumption of suboxone and the presence of drugs in initial urine.

Firstly, a sole statistical moderately strong correlation was identified for drug in urine and receiving suboxone (r = 0.499, p = 0.013).

Secondly, several correlations ranging from very weak to weak were identified when focusing on receiving suboxone. Firstly, a positive very weak correlation was identified between receiving suboxone and COWS day 3 (r = 0.167, p < 0.001). Further, several weak correlations were identified between receiving suboxone and PRN medication for insomnia (r = 0.325, p < 0.001), PRN medication for pain (r = 0.200, p = 0.005), COWS day 1 (r = 0.299, p < 0.001) and COWS day 2 (r = 0.275, p < 0.001).

Thirdly, three very weak correlations were identified between receiving PRN medication for insomnia and PRN medication for pain (r = 0.196, p = 0.013), length of stay (r = 0.184, p = 0.009) and COWS day 1 (r = 0.195, p = 0.006).

Finally, three correlations were identified as being statistically significant with PRN medication for pain relief. Firstly, both pain score day 1 (r = 0.423, p < 0.001) and pain score day 2 (r = 0.534, p < 0.001) were deemed to have moderately strong

correlations with PRN medication for pain relief, while pain score day 3 was deemed to be a weak correlation ($r = 0.318$, $p < 0.001$).

Chapter 5. DISCUSSION

The primary focus of this chapter is to highlight and discuss the findings from the previous chapter and compare these to the literature and address the research questions, aims and objectives of the study. The fifth chapter will explore and discuss the study's main findings in relation to current literature and theoretical knowledge while providing a critical analysis of the identified study limitations, implications of the study, and clinical implications. Finally, the study will provide a series of recommendations for future research to further enrich the research area.

5.1 Main Findings

To ensure that the study hypotheses and aims are effectively addressed, the following sections will be separated into three to allow each hypothesis to be addressed and discussed in detail. Initially, we will discuss the impact on COWS following the protocol. Following this, we will discuss the changes in pain scores and compared to previous literature. Finally, we will present a discussion highlighting the differences in how patients left treatment and whether the use of suboxone had an impact on treatment completion.

5.1.1 COWS outcome

The current study found that COWS scores improved following the implementation of the suboxone protocol. The findings demonstrated that while the majority of subjects had reduced from 10.01 (±4.72) to 6.48 (±3.53) from day one to day three, which further reduced to 2.97 (±2.37) at week two. However, while it is clear that reductions have been made, it is key to note that the initial scores are classified as mild withdrawal, which may suggest that the patients were not experiencing a great deal of withdrawal symptoms. However, the findings demonstrate a day-on-day reduction in symptoms which is further highlighted by the lack of increased symptoms experienced throughout the data period. During the data collection period, the severity of the withdrawal symptoms ranged from mild to moderately severe on the first day (0 to 28) and increased further on day two (32) before decreasing for the remaining study.

The findings from the current study are in line with previous studies that have found a positive effect of suboxone on reducing withdrawal symptoms in OUD patients. As such, these findings provide support to previous studies (Lekas, 2014; Towns et al.,

2020; Heo & Scott, 2018; Strain et al., 2011) that have discussed and outlined the benefits that the use of suboxone can have on easing withdrawal symptoms. As such, this further demonstrates the ability of suboxone to attenuate the opioid withdrawal syndrome, which demonstrates its effectiveness in treating the symptoms of spontaneous opioid withdrawal observed in the subjects. In contrast, this would suggest that a reduction in opioid withdrawal symptoms would increase adherence to treatment, although this was not proven in the current study. As previous studies have demonstrated, withdrawal symptoms from opioids can be very difficult and challenging, and the cravings experienced can be too much for some individuals. This is due to the fact that the opioid withdrawal symptoms are primarily caused by the NAergic activity in locus coeruleus neurons linked to the opioid receptors (Shah & Huecker, 2021).

5.1.2 Pain Intensity

The current study found that pain intensity scores reduced following the implementation of the suboxone protocol. The findings demonstrated a moderate effect of the intervention on pain intensity, demonstrating that suboxone reduced the pain experienced, although it is key to note the severity of this change. As noted in chapter 4.3, paragraph 2, there was no change in pain score in most cases, but there were a greater amount of decreases in pain compared to increases. As the data showed, the initial pain score was on average 1.96, which increased to 2.37 on day two but reduced to 1.84 on day three. Throughout the data collection periods, the range of scores varied between no pain and severe pain, but most cases were mild pain.

In most cases, the pain intensity remained mild, further posing some questions about the potential impact over the rehabilitation period. However, due to the lack of data present, this may have had a significant impact on the results. In this sense, the additional data may have led to greater understandings of the overall impact of the suboxone protocol on OUD subjects.

In terms of the findings of the study, the reductions in pain intensity and severity are in line with previous studies (Potter et al., 2010; Yokell et al., 2011), of which the current study further supports the use of suboxone. For example, Potter et al. (2010) found that more severe pain and pain inference was associated with opioid use in the 30 days prior to follow-up. Further, the study reported that patients who experienced moderate to severe pain at the start of detoxification were associated with treatment success post-

detoxification, which may suggest that these patients may have already been experiencing or had experienced withdrawal symptoms prior to detoxification which may have led to an increased level of motivation to remain in the detoxification. As such, the correlations identified in the current study show a significant correlation between pain and COWS, suggesting that those with the highest COWS scores experienced the greatest pain intensity. Therefore, such findings would appear to complement the findings from Potter and colleagues.

5.1.3 Treatment Completion

The current study found that the use of a suboxone protocol was not more likely to improve treatment compliance. In most cases, the study found that the majority of patients, whether with (66.1%) or without (62.5%) suboxone protocol, choose to leave the treatment against medical attention. However, it is important to note the difference in the group sizes in such findings, which will have had a significant impact on these findings as coming to the prevalence of discharge type on a group that is almost twelve times as large. However, it is also important to note that most cases in this study were discharged against medical advice (66%), which should be considered when planning future studies. Further, the study found further non-significant impacts on the ingestion of PRN medication for insomnia and pain. Similar to the findings for the use of the suboxone protocol, the majority of patients were discharged against medical advice (77.8%) compared to those through regular discharge (22.2%), which was similar for those who receive both the suboxone protocol and medication for insomnia were more subjects were discharged against medical advice (65.4%) compared to regular discharge (34.6%). Further, the study found that the use of PRN medication for pain did not increase the likelihood of treatment completion, whereby those who received the medication were as likely as those who did not to be discharged against medical advice, both 59.1% and 67.9%, respectively.

The findings from the current study appear to contrast that of previous studies, such as Steele and Cunningham (2012) and Tanner et al. (2011), who found improved compliance with treatment following suboxone protocols. As such, this would suggest that the use of the suboxone protocol, in addition to PRN medication, does not necessarily result in improved treatment compliance, although this may be associated with the single center approach. To understand the impact on compliance in greater detail, more research is required which understands a greater range of the factors influencing treatment

compliance. This can include issues relating to challenges arising from withdrawal, as has also been identified in additional literature (Piralishvili et al., 2013; Carpenter, 2012; Mauger et al., 2014).

5.2 Study Limitations

While the current study was successful in meeting its aims, there were limitations present. Therefore, this section will highlight the identified limitations and suggest how such limitations can be rectified in the future.

Firstly, the findings from the study demonstrate that while positive differences were identified for COWS and pain intensity, the population of suboxone patients was substantially greater than non-suboxone protocols, which impacts the ability to determine if suboxone protocol is more effective in supporting opioid recovery. Future studies should consider the importance of gathering data from a diverse sample to examine further the differences in the impact of suboxone versus other medications to reduce opioid withdrawal symptoms and reduce pain intensity in OUD patients.

A second limitation of the study lies in using a single treatment and rehabilitation center located in the UAE. The use of a single center has a significant impact on generalizing the findings from the study to the remaining population. Further, the use of a single-center study can offer a lack of scientific rigour and external validity, which means widespread changes in practice may not be practical, and the inclusion of such findings into guidelines would be challenging (Bellomo et al., 2009). This is emphasized by previous findings that found that single-center trials tend to show larger intervention effects than multicenter trials (Bafeta et al., 2012; Dechartres et al., 2011; Unverzagt et al., 2013), suggesting that the findings from the current study may be higher than if a multicenter approach was adopted. Therefore, future studies should consider using a large population that replicates a more general overview of the population from multiple centers.

Thirdly, while the data collection process was completed in a standardized and objective manner that utilized a recommended abstraction method to prepare the details, there remains a risk of information bias. This largely arises due to the collection of data previously inputted by a clinician, which leads to the potential risk of data entry error and increasing the concern surrounding the inherent validity and reliability of the data collected. However, in the future, should data be collected in a similar manner, then the

provision of further reviewers to conduct a stringent assessment of the inter-rater reliability of the data to be determined.

Fourthly, the missing data relating to both pain intensity and COWS had a substantial difference from the beginning of the study, which may have impacted the results. In this study, the researcher was the lone data collector which might have introduced reviewer bias and reliability problems and was impacted by the potential inability to record data from the original data inputter.

Finally, the study failed to gain data regarding the dosage provided to the subjects, which could have allowed further investigation into the most efficient dosage to bring about the most desirable outcomes. In this sense, if more data was recorded initially regarding the dosage provided – which would be anticipated as being higher for those experiencing a greater number of withdrawal symptoms – but this could provide new insights that could have been very beneficial to the study.

5.3 Study Implications

To the best of the researcher's knowledge, this study is among the first to investigate the impact of suboxone on opioid withdrawal and pain intensity in OUD patients. The primary application from the current study emphasizes the importance of conducting similar studies on a larger scale involving multi-centers as this could provide a greater basis for generalizability of the findings and may lead to an opportunity to understand if adopting a suboxone protocol is more effective than other protocols in reducing opioid withdrawal symptoms and pain intensity during detoxification protocols. Without such studies occurring on a larger scale, clinical practice will not be possible to be influenced.

However, it is key that researchers understand the noted limitations above and should be aware of such limitations when interpreting these results. While the study provides key insights into the potential impact of suboxone protocols to support detoxification protocols in a sole center, the calculated effect may be lower depending on the populations it is implemented in.

Chapter 6. CONCLUSION AND RECOMMENDATIONS

The current chapter will provide a summary of the findings from the study and what this means in terms of the future directions of suboxone use in practice and how this may benefit future treatment. This will include an overview of the aims and how the study has met these. Finally, the conclusion will provide recommendations for further investigation as well as noting any further gaps identified in the literature.

6.1 Conclusion

The current study aimed to assess the effectiveness and impact of the suboxone detoxification treatment protocol on patients with OUDs in reducing withdrawal severity, pain score and successful treatment completion rate. The current study identified improvements in COWS and pain intensity which allowed an opportunity to understand the impact of suboxone on withdrawal symptoms and pain in OUD subjects. Further, the study aimed to understand the impact of suboxone on the subjects discharge type.

Initially, the study has provided support for using suboxone protocols in reducing withdrawal symptoms over two weeks. However, the study initially began with the vast majority of patients experiencing mild withdrawal symptoms, and while these symptoms remained at a mild level, they continued to reduce, suggesting that suboxone is effective. However, the effectiveness in more severe cases is still to be determined.

Secondly, the study identified a significant reduction in pain intensity and severity in the subjects following suboxone protocol being applied. This further supports the use of suboxone in reducing pain experienced during the withdrawal of opioids and emphasizes its place in detoxification protocols. Moving forward, more studies must further investigate such findings on a larger scale to ensure that the reliability of such findings can be verified, which could lead to new best practice guidance being developed and implemented in practice.

Finally, the study failed to identify the benefit of suboxone to improve patient detoxification treatment compliance and completion, which adds to a growing debate regarding the efficiency of suboxone to support patient compliance. The study found that many subjects were released against medical advice in both the suboxone and non-suboxone groups, and therefore, the study cannot support the suggestion of suboxone treatment being associated with significant difference in completing in-patient treatment.

6.2 Recommendations

Based on the current findings and the literature, it is recommended that a larger study that utilizes a multi-centered approach should be considered. This would provide an opportunity to generalize the effect of suboxone in this population and allow an opportunity to understand a more reliable effect on opioid use disorder management.

Secondly, within this study, the benefit of suboxone was found; however, to ensure that the symptoms can be better monitored, technologies for monitoring could be used in collaboration. In this sense, future studies may wish to utilize a study comparing suboxone with other pharmacological approaches but utilize monitoring technology better to compare the impact of symptoms withdrawal on OUD patients.

Thirdly, it is recommended that future studies ensure that adequate samples are recruited to ensure that comparison between pharmacological approaches can be made, but further, can allow a greater understanding of treatment compliance. In this sense, the current study was unable to determine if suboxone protocol had an effect on the treatment completion rate as there was a significantly smaller population in the non-suboxone group.

Chapter 7. PERSONAL REFLECTION

Without question, completing my dissertation has been a challenging journey, but the feeling of achievement, self-fulfillment, and satisfaction I have experienced during this time have been worth every challenge. Throughout this journey, I have had the opportunity to develop my skills as both a researcher and a nurse, which will be increasingly beneficial in my future career. This includes developing a range of research skills, including critical thinking, statistical methodologies, and ethical procedures, as well as developing transferable core skills, such as communication, time management and presentation skills.

To ensure that I can reflect on this experience in detail, I have decided to utilize Gibbs (1988) Reflective Cycle (Appendix 2), which has been encouraged in the literature due to its ability to provide a more balanced and accurate judgement while being easy to utilize and understand (Husebo et al., 2015; Davies, 2012). The cycle consist of six steps; description, feelings, evaluation, analysis, conclusion and action plan. This provides an opportunity to highlight the key elements from experience and delve into the impact these had on practice in the present and how it will impact future practice and actions. Of all the skills I believe I have developed during this project, I think my ability to manage my time has been the most developed. Rather than focusing solely on time management, I believe it is important to consider how my organization skills have developed, which has ultimately supported my improved time management skills.

7.1 Experience

To successfully complete a dissertation project, the writer must conduct and complete several foundational stages, including gaining ethical approval, proposal writing, and statistical analysis and writing the largest word count to date. However, this process also required further communication and working with others to collect data on appropriate subjects and interact with my supervisors, who were able to offer invaluable advice and guidance during the project. However, one of the biggest challenges was being in complete control of the project, meaning there was a lack of structure, planning and a timetable different from the academic environment I was used to. Following ethical approval, I found a key challenge was understanding where to start the project. I also identified difficulties in understanding the most effective ways of writing the project.

7.2 Feelings

Moving from an environment where I often have a plan pre-made or have a full understanding of the future of a project, to say this was more challenging would be an understatement. At times, I felt overwhelmed, exhausted, and unsure about the right move to ensure that I could produce the best dissertation possible. At times, I experienced a great deal of frustration at my lack of decisiveness during various elements of the project and my lack of progression in line with my proposed timeline. This caused me to reflect upon my abilities on several occasions, especially when I felt in over my head, which helped me grow and understand where my weaknesses lay.

7.3 Evaluation

From a positive perspective, I believe that I was able to develop some of my pre-existing skills to ensure that I could put together a good proposal for my initial ideas. These skills were then utilized and developed further throughout the program, allowing me to become a more effective researcher. I believe that my passion and interest in the research topic significantly impacted my motivation and drive to complete my dissertation to a high standard. More so, my desire to enhance the knowledge and understanding of suboxone as a pain relief and effective treatment for opioid withdrawal.

From a negative perspective, I went into the project as a novice researcher with minimal experience of the trials and tribulations associated with the demands of a project. In some cases, I found that some of the deadlines I originally set were unrealistic, and I underestimated the challenges of the basic stages of data analysis and how timely entering data into a spreadsheet can be. Such challenges led me to be underprepared for some stages, led to unproductivity periods, and led to a lack of motivation. I found that I was able to counteract these periods by developing a routine whereby I could work in a comfortable and quiet environment, which allowed me to refocus, which helped me maintain a positive perspective on my schedule. Further, this routine allowed me to modify my timetable to a more realistic timetable that fit well with my schedule and allowed me to have a more relaxed but focused approach, which helped me progress with my project.

7.4 Analysis

During the project, it became evident the important role of organizational skills and effective time management skills had in successful projects. As discussed by Ahmad et al. (2019), organizational skills are essential in academic writing as this can allow thought processes to be triggered and facilitated and provide opportunities for enhanced analysis, criticism and summarization of findings. As such, I found that when I had begun focusing on my personal time management skills and where improvements were required, I was able to put additional training into ensuring I could enhance these capabilities.

I believe that my new understanding of the complexities and unpredictable nature of research projects and the importance of considering both internal and external variables can impact a project. This has allowed me to appreciate the research process in greater depth, making me feel more confident and comfortable conducting these projects in the future. During this project, I have developed my existing skills regarding various elements of time management and organization, specifically through prioritization and dividing larger tasks into more manageable sizes. This process has allowed me to recognize my tendency to become impatient with delays and inefficiency and develop a greater awareness that my priorities are not the same as others. Finally, I have effectively developed a number of personal qualities associated with time management skills, including determination, confidence, self-efficacy, working systematically and greater patience.

7.5 Conclusions

Across medical care settings, effective time management is a critical skill that is essential in most areas and is vital for progressions as a clinical practice researcher. The learning and development I have made during this project have many benefits, both personally and professionally, which can help me progress as a professional and a human. I have been able to develop a greater level of patient and understanding and understand how to collaborate with others to enhance projects. As a healthcare professional, I will be required to successfully manage a busy workload and meet the needs of patients continually and to a high standard. Therefore, the skills I have developed during this period regarding my organizational abilities and time management skills, such as prioritization, will benefit me in my professional capacity and help me become a more effective practitioner. These skills can prove invaluable in supporting me to balance my

clinical responsibilities and keep me in conducting further research and educational development. I believe it is a fair appraisal to say that thanks to this project, I am now better equipped for future projects due to my enhanced perseverance, adaptability, and flexibility.

7.6 Action Plan

While I agree that I have made a great deal of progress during this project, I must continue to ensure that I finetune my skills and abilities to continue developing as a nurse. Therefore, I will continue to engage in further training to develop my clinical skills and research abilities and gain more clinical experience. This will provide me with an opportunity to enhance my understanding of how to apply research findings and evidence-based literature into my clinical practice. Further, I will explore my options for shadowing senior colleagues who can act as mentors to enhance my knowledge and understanding further.

“**REFERENCES**

Aghakhani, N., Lopez, V. & Cleary, M., 2017. Experiences and Perceived Social Support among Iranian Men on Methadone Maintenance Therapy: A Qualitative Study. *Issues in Mental Health Nursing,* 38(9), pp. 692-697.

Ahmadi, J., Sarani, E. M. & Jahromi, M. S., 2020. Rapid effect of a single-dose buprenorphine on reduction of opioid craving and suicidal ideation: A randomized, double blind, placebo-controlled study. *Tzu Chi Medical Journal,* 32(1), pp. 58-64.

Ahmad, M., Mahmood, M. A. & Siddique, A. R., 2019. Organisational skills in academic writing: A study on coherence and cohesion in Pakistani research abstracts. *Languages,* 4(4), p. 92.

Akdağ, E. M. et al., 2018. The relationship between internalized stigma and treatment motivation, perceived social support, depression and anxiety levels in opioid use disorder. *Psychiatry and Clinical Psychopharmacology*, 28(4), pp. 394-401.

Ates, N., Unubol, B., Bestepe, E. E. & Bilici, R., 2019. The effect of perceived social support on quality of life in Turkish men with alcohol, opiate and cannabis use disorder. *Journal of Ethnicity in Substance Abuse.*

Bafeta, A. et al., 2012. Impact of single centre status on estimates of intervention effects in trials with continuous outcomes: meta-epidemiological study. *BMJ,* p. 344.

Baser, O., Chalk, M., Fiellin, D. A. & Gastfriend, D. R., 2011. Cost and utilization outcomes of opioid-dpendence treatments. *American Journal of Managed Care,* 17(8), p. S235.

Bellomo, R., Warrillow, S. J. & Reade, M. C., 2009. Why we should be wary of single-center trials. *Critical Care Medicine,* 37(12), pp. 3114-3119.

Blanco, C. & Volkow, N. D., 2019. Management of opioid use disorder in the USA: present status and future directions. *The Lancet*, 393(10182), pp. 1760-1772.

Blondell, R. D. et al., 2010. A clinical trial comparing tapering doses of buprenorphine with steady doses for chronic pain and co-existent opioid addiction. *Journal of Addiction Medicine,* 4(3), p. 140.

Bowen, S. et al., 2014. Relative efficacy of mindfulness-based relapse prevention, standard relapse prevention, and treatment as usual for substance use disorders: a randomized clinical trial. *JAMA psychiatry,* 71(5), pp. 547-556.

Bradley, K. A. & Rubinsky, A. D., 2013. Why Not Add Consumption Measures to Current Definitions of Substance Use Disorders? Commentary on Rehm et al. 'Defining Substance Use Disorders: Do We Really Need More Than Heavy Use?'. *Alcohol and Alcoholism,* 48(6), pp. 642-643.

Brady, K. T., McCauley, J. L. & Back, S. E., 2016. Prescription opioid misuse, abuse, and treatment in the United States: an update. *American Journal of Psychiatry,* 173(1), pp. 18-26.

Canadian Centre on Substance Use and Addiction, 2014. *Substance Use Disorders: A Serious Health Issue [infographic]*. [Online] Available at: https://www.ccsa.ca/substance-use-disorders-serious-health-issue-infographic
[Accessed 7 June 2021].

Carpenter, T. M., 2012. Buprenorphine and Naloxone (Suboxone) Efficacy Compared With Methadone and Challenges in Treating Opiate Addiction. *Thesis.*

Chassin, L., Colder, C. R., Hussong, A. & Sher, K. J., 2016. Substance use and substance use disorders. *Developmental Psychopathology,* pp. 1-65.

Chou, C. C., Robb, J. L., Clay, M. C. & Chronister, J. A., 2013. Social support as a mediator between internalized stigma and coping behaviors of individuals with substance abuse issues. *Rehabilitation Research, Policy, and Education,* 27(2), pp. 104-107.

Connery, H. S., 2015. Medication-assisted treatment of opioid use disorder: review of the evidence and future directions. *Harvard Review of Psychiatry,* 23(2), pp. 63-75.

Cooper, S. & Nielsen, S., 2017. Stigma and social support in pharmaceutical opioid treatment populations: A scoping review. *International Journal of Mental Health and Addiction,* 15(2), pp. 452-469.

D'Onofrio, G. et al., 2015. Emergency department–initiated buprenorphine/naloxone treatment for opioid dependence: a randomized clinical trial. *Jama,* 313(16), pp. 1636-1644.

Davies, S., 2012. Embracing reflective practice. *Education for Primary Care,* 23(1), pp. 9-12.

Davis, J. M. et al., 2018. Comparison of safety and efficacy of methadone vs morphine for treatment of neonatal abstinence syndrome: a randomized clinical trial. *JAMA Pediatrics,* 172(8), pp. 741-748.

Dayal, P. & Balhara, Y. P., 2016. Profile of female patients seeking in=patient treatment for prescription opioid abuse from a teritary care drug dependence treatment centre from India. *The Indian Journal of Medical Research,* 143(1), p. 95.

Day, E. & Strang, J., 2011. Outpatient versus inpatient opioid detoxification: a randomized controlled trial. *Journal of Substance Abuse Treatment,* 40(1), pp. 56-66.

Dechartres, A. et al., 2011. Single-center trials show larger treatment effects than multicenter trials: evidence from a meta-epidemiologic study. *Annalsof Internal Medicine,* 155(1), pp. 39-51.

Degenhardt, L. et al., 2018. The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Psychiatry,* 5(12), pp. 987-1012.

Degenhardt, L. et al., 2014. The global epidemiology and burden of opioid dependence: results from the global burden of disease 2010 study. *Addiction,* 109(8).

Dematteis, M. et al., 2017. Recommendations for buprenorphine and methadone therapy in opioid use disorder: a European consensus. *Expert opinion on pharmacotherapy,* 18(18), pp. 1987-1999.

Department of Health, 2003. *Confidentiality: NHS Code of Practice.* [Online] Available at: http://www.connectingforhealth.nhs.uk/systemsandservices/infogov/codes [Accessed 9 July 2021].

Diaper, A. M., Law, F. D. & Melichar, J. K., 2014. Pharmacological strategies for detoxification. *British Journal of Clinical Pharmacology,* 77(2), pp. 302-314.

Dissabandara, L. O. et al., 2014. Dependent heroin use and associated risky behaviour: The role of rash impulsiveness and reward sensitivity. *Addictive behaviors,* 39(1), pp. 71-76.

Dreifuss, J. A. et al., 2013. Patient characteristics associated with buprenorphine/naloxone treatment outcome for prescription opioid dependence: Results from a multisite study. *Drug and alcohol dependence,* 131(1-2), pp. 112-118.

Dunn, K. E. et al., 2015. Characterizing opioid withdrawal during double-blind buprenorphine detoxification. *Drug and Alcohol Dependence,* 151(1), pp. 47-55.

El Emam, K. et al., 2006. Evaluating common de-identification heuristics for personal health information. *Journal of Medical Internet Reserch,* 8(4), p. e28.

Furst, R. T., 2013. Suboxone misuse along the opiate maintenance treatment pathway. *Journal of Addictive Diseases*, 32(1), pp. 53-67.

Gearing, R. E., Mian, I. A., Barber, J. & Ickowicz, A., 2006. A methodology for conducting retrospective chart review research in child and adolescent psychiatry. *Journal of the Canadian Academy of Child and Adolescent Psychiatry,* 15(3), p. 126.

Ghaddar, A., Abbas, Z. & Haddad, R., 2017. Opiate agonist treatment to improve health of individuals with opioid use disorder in Lebanon. *Harm Reduction Journal,* 14(1), pp. 1-7.

Goldstein, R. B. et al., 2015. Nosologic comparisons of DSM-IV and DSM-5 alcohol and drug use disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions-III. *Journal of Studies on Alcohol and Drugs,* 76(3), pp. 378-388.

Haight, B. R. et al., 2019. Efficacy and safety of a monthly buprenorphine depot injection for opioid use disorder: a multicentre, randomised, double-blind, placebo-controlled, phase 3 trial. *The Lancet,* 393(10173), pp. 778-790.

Hasin, D. S. et al., 2012. Analyses related to the development of DSM-5 criteria for substance use related disorders: 2. Proposed DSM-5 criteria for alcohol, cannabis, cocaine and heroin disorders in 663 substance abuse patients. *Drug and alcohol dependence,* 122(1-2), pp. 28-37.

Hasin, D. S. et al., 2013. DSM-5 criteria for substance use disorders: recommendations and rationale. *American Journal of Psyciatry,* 170(8), pp. 834-851.

Heather, N., 2013. A Radical But Flawed Proposal: Comments on Rehm et al. 'Defining Substance Use Disorders: Do We Really Need More than Heavy Use?. *Alcohol and Alcoholism,* 48(6), pp. 646-647.

Heo, Y. A. & Scott, L. J., 2018. Buprenorphine/Naloxone (Zubsolv®): A review in opioid dependence. *CNS drugs,* 32(9), pp. 875-882.

Husebo, S. E., O'Regan, S. & Nestel, D., 2015. Reflective practice and its role in simulation. *Clinical Simulation In Nursing,* 11(8), pp. 368-375.

Jaffe, K., Korthuis, T. & Richardson, L., 2021. 'This could be my last chance': Therapeutic optimism in a randomised controlled trial for substance use disorders. *Sociology of Health & Illness.*

Jones, C. W. et al., 2018. Comparison between buprenorphine provider availability and opioid deaths among US counties. *Journal of Substance Abuse Treatment,* 93(1), pp. 19-25.

Kalra, D., 2006. Electronic health record standards. *Yearbook of medical informatics,* 15(01), pp. 136-144.

Kamenderi, M. et al., 2021. Stauts of drugs and substance abuse among the general population in Kenya. *African Journal of Alcohol & Drug Abuse,* 1(1), pp. 54-59.

Karimi, S. et al., 2010. Boolean versus ranked querying for biomedical systematic reviews. *BMC medical iforamtics and decision making*, pp. 1-20.

Kelly, S. M. et al., 2010. The relationship of social support to treatment entry and engagement: The Community Assessment Inventory. *Substance Abuse,* 31(1), pp. 43-52.

Khanna, I. K. & Pillariseti, S., 2015. Buprenorphine–an attractive opioid with underutilized potential in treatment of chronic pain. *Journal of Pain Research,* 8(1), p. 859.

Kilmas, J. et al., 2018. Slow release oral morphine versus methadone for the treatment of opioid use disorder. *BMJ Open*, 9(1), p. e025799.

Kurth, A. E. et al., 2018. The opioid epidemic in Africa and its impact. *Current addiction reports,* 5(4), pp. 428-453.

Kushida, C. A. et al., 2012. Strategies for de-identification and anonymization of electronic health record data for use in multicenter research studies. *Medical Care,* 50(S1), p. S82.

Larochelle, M. R. et al., 2018. Medication for opioid use disorder after nonfatal opioid overdose and association with mortality: a cohort study. *Annals of Internal Medicine,* 169(3), pp. 137-145.

Law, F. D. et al., 2017. Buprenorphine/naloxone versus methadone and lofexidine in community stabilisation and detoxification: A randomised controlled trial of low dose short-term opiate-dependent individuals. *Journal of Psychopharmacology,* 31(8), pp. 1046-1055.

Lekas, C. T., 2014. Is the Use of the Drug Buprenorphine and Naloxone (Suboxone) as Effective in Suppressing Opioid Dependency and Its Withdrawal Symptoms, or Is It Simply a Surrogate for the Opiate With the Addictive Results?. *Thesis.*

Liebschutz, J. M. et al., 2014. Buprenorphine treatment for hospitalized, opioid-dependent patients: a randomized clinical trial. *JAMA Internal Medicine,* 174(8), pp. 1369-1376.

Liu, L. & Duan, H., 2015. Maintenance of drug using behaviour among Chinese female drug users. *Population & Development,* 21(4), pp. 74-81.

Livingston, J. D. & Boyd, J. E., 2010. Correlates and consequences of internalized stigma for people living with mental illness: A systematic review and meta-analysis. *Soc Sci Med,* 71(12), pp. 2150-2161.

Lynch, F. L. et al., 2014. Costs of care for persons with opioid depndence in commercial integrated health systems. *Addiction Science & Clinical Practice,* 9(1), pp. 1-7.

Ma, J. B. Y. P. et al., 2019. Effects of medication-assisted treatment on mortality among opioids users: a systematic review and meta-analysis. *Molecular Psychiatry,* 24(12), pp. 1868-1883.

Manchikanti, L. & Singh, A., 2008. Therapeutic opioids: A ten-year perspective on the complexities and complications of the escalating use, abuse, and nonmedical use of opioids. *Pain Physician,* 11(S2), pp. S63-S88.

Mauger, S., Fraser, R. & Gill, K., 2014. Utilizing Buprenorphine–Naloxone to treat illicit and Prescription-opioid Dependence. *Neuropsychiatric disease and treatment,* 10(1), p. 587.

McCambridge, J., McAlaney, J. & Rowe, R., 2011. Adult consequences of late adolescent alcohol consumption: a systematic review of cohort studies. *PLoS Med,* 8(2), p. e1000413.

Meader, N., 2010. A comparison of methadone, buprenorphine and alpha2 adrenergic agonists for opioid detoxification: a mixed treatment comparison meta-analysis. *Drug and Alcohol Dependence,* 108(1-2), pp. 110-114.

Miller, M. L. & Hurd, Y. L., 2017. Testing the gateway hypothesis. *Neuropsychopharmacology,* 42(5), pp. 985-986.

Morris, B. J. & Mir, H. R., 2015. The opioid epidemic: impact on orthopaedic surgery. *Journal of the American Academy of Orthopaedic Surgeons,* 23(5), pp. 267-271.

Mueser, K. T. et al., 2013. A randomized controlled trial of family intervention for co-occurring substance use and severe psychiatric disorders. *Schizophrenia bulletin,* 39(3), pp. 658-672.

Nebhinani, N. et al., 2013. Demographic and clinical profile of substance abusing women seeking treatment at a de-addiction center in north India. *Industrial Psychiatry Journal,* 22(1), p. 12.

NICE, 2019. *Drug misuse: Opioid Detoxification. The NICE Guideline,* London: National Collaborating Centre for Mental Health.

NICE, 2021. *Buprenorphine.* [Online] Available at: https://cks.nice.org.uk/topics/opioid-dependence/prescribing-information/buprenorphine/#dose
[Accessed 10 July 2021].

NICE, 2021. *Buprenorphine with Naloxone.* [Online] Available at: https://bnf.nice.org.uk/drug/buprenorphine-with-naloxone.html [Accessed 11 July 2021].

Nicholls, L., Bragaw, L. & Ruetsch, C., 2010. Opioid dependence treatment and guidelines. *Journal of Managed Care Pharmacy,* 16(1), pp. 14-21.

Northrup, T. F. et al., 2015. Opioid withdrawal, craving, and use during and after outpatient buprenorphine stabilization and taper: a discrete survival and growth mixture model. *Addictive behaviors,* 41(1), pp. 20-28.

Oreskvoich, M. R. et al., 2015. The prevalence of substance use disorders in American physicians. *The American Journal on Addictions,* 24(1), pp. 30-38.

Peacock, A. et al., 2018. Global statistics on alcohol, tobacco and illicit drug use: 2017 status report. *Addiction,* 113(10), pp. 1905-1926.

Perry, N. & Taylor, B., 2021. Case Study: Three Day Suboxone Taper for Opiate Withdrawal. *International Journal of Psychiatry Research,* 4(3), pp. 1-2.

Piralishvili, G., Gamkrelidze, I., Nikolaishvili, N. & Chavchanidze, M., 2013. Needs assessment and treatment compliance at state opioid substitution treatment programes in Georgia. *Georgian Medical News,* 214(1), pp. 28-32.

Plunkett, A., Kuehn, D., Lenart, M. & Wilkinson, I., 2013. Opioid maintenance, weaning and detoxification techniques: where we have been, where we are now and what the future holds. *Pain Management,* 3(4), pp. 277-284.

Potter, J. S. et al., 2010. Pain and continued opioid use in individuals receiving buprenorphine–naloxone for opioid detoxification: Secondary analyses from the Clinical Trials Network. *Journal of Substance Abuse Treatment,* 38(1), pp. S80-S86.

Pourhoseingholi, M. A., Vahedi, M. & Rahimzadeh, M., 2013. Sample size calculation in medical studies. *Gastroenterology and Hepatology from bed to bench,* 6(1), p. 14.

Rehm, J. et al., 2013. Defining Substance Use Disorders: Do We Really Need More Than Heavy Use?. *Alcohol And Alcoholism,* 48(6), pp. 633-640.

Rice, P., 2013. A Commentary on Defining Substance Use Disorders: Do We Really Need More Than Heavy Use?. *Alcohol and Alcoholism,* 48(6), p. 641.

Ritchie, H. & Roser, M., 2019. *Drug use,* s.l.: Our World in Data.

Rosenthal, R. N. et al., 2016. Effect of buprenorphine implants on illicit opioid use among abstinent adults with opioid dependence treated with sublingual buprenorphine: a randomized clinical tria. *Jama,* 316(3), pp. 282-290.

Saunders, J. B., 2013. The Concept of Substance Use Disorders. A Commentary on 'Defining Substance Use Disorders: Do We. *Alcohol and Alcoholism,* 48(6), pp. 644-645.

Services, U. D. o. H. a. H., 2019. *Addressing a Growing Problem - Help is Just a Phone Call Away.* [Online] Available at: https://www.goiam.org/news/addressing-a-growing-problem-help-is-just-a-phone-call-away/
[Accessed 7 July 2021].

Shah, M. & Huecker, M. R., 2021. *Opioid Withdrawal.* s.l.:StatPearls Publishing.

Shcherbakova, N., Tereso, G., Spain, J. & Roose, R. J., 2018. Treatment persistence among insured patients newly starting buprenorphine/naloxone for opioid use disorder. *Annals of Pharmacotherapy,* 52(5), pp. 405-414.

Sigmon, S. C. et al., 2012. Opioid detoxification and naltrexone induction strategies: recommendations for clinical practice. *The American Journal of Drug and Alcohol Abuse,* 38(3), pp. 187-199.

Silbermann, M., 2010. Opioids in middle eastern populations. *Asian Pacific Journal of Cancer Prevention,* 11(S1), pp. 1-5.

Silbermann, M., 2011. Current trends in opioid consumption globally and in Middle Eastern countries. *Journal of Pediatric Hematology Oncology,* 33(1), pp. S1-S5.

Sordo, L. et al., 2017. Mortality risk during and after opioid substitution treatment: systematic review and meta-analysis of cohort studies. *BMJ,* p. 357.

Steele, A. & Cunningham, P., 2012. A Comparison of Suboxone and Clonidine Treatment Outcomes in Opiate Detoxification. *Archives of Psychiatric Nursing,* 26(4), pp. 316-323.

Stein, M. et al., 2020. Initiating buprenorphine treatment for opioid use disorder during short-term in-patient 'detoxification': a randomized clinical trial. *Addiction,* 115(1), pp. 82-94.

Strain, E. C., Harrison, J. A. & Bigelow, G. E., 2011. Induction of opioid-dependent individuals onto buprenorphine and buprenorphine/naloxone soluble films. *Clinical Pharmacology and Therapeutics,* 89(3), pp. 443-449.

Tanaree, A., Assanangkornchai, S. & Kittirattanapaiboon, P., 2017. Pattern and risk of developing alcohol use disorders, illegal substance use and psychiatric disorders after early onset of alcohol use: Results of the Thai National Mental Health Survey 2013. *Drug and alcohol dependence,* 170(1), pp. 102-111.

Tanner, G. R., Bordon, N., Conroy, S. & Best, D., 2011. Comparing methadone and Suboxone in applied treatment settings: the experiences of maintenance patients in Lanarkshire. *Journal of Substance Use,* 16(3), pp. 171-178.

Timko, C. et al., 2016. Retention in medication-assisted treatment for opiate dependence: a systematic review. *Journal of Addictive Diseases,* 35(1), pp. 22-35.

Towns, C., Mee, H. & McBride, S., 2020. Opioid dependence with successful transition to suboxone (buprenorphine/naloxone) in a young woman with hereditary coproporphyria.. *The New Zealand Medical Journal,* 133(1518), pp. 81-83.

United Nations, 2019. *World Drug Report 2019: 35 million people worldwide suffer from drug use disorders while only 1 in 7 people recieve treatment,* s.l.: United Nations: Office on Drugs and Crime.

United Nations, 2021. *UNODC World Drug Report 2021: pandemic effects ramp up drug risks, as youth underestimate cannabis dangers,* s.l.: United Nations.

Unverzagt, S., Prondzinsky, R. & Peinemann, F., 2013. Single-center trials tend to provide larger treatment effects than multicenter trials: a systematic review. *Journal of Clinical Epidemiology,* 66(11), pp. 1271-1280.

Vaughan, B. R. & Kleber, H. D., 2015. Opioid detoxification. In: *The American Psychiatric Publishing Textbook of Substance Abuse Treatment.* Washington, DC: American Psychiatric Publishing Inc.

Vaughan, B. R. & Kleber, H. D., 2015. Opioid detoxification. In: *The American Psychiatric Publishing Textbook of Substance Abuse Treatment.* Washington, DC: American Psychaitric Publishing Inc.

Virk, M. S., Arttamangkul, S., Birdsong, W. T. & Williams, J. T., 2009. Buprenorphine is a weak partial agonist that inhibits opioid receptor desensitization. *Journal of Neuroscience,* 29(22), pp. 7341-7348.

Volkow, N. D. et al., 2011. Characteristics of opioid prescriptions in 2009. *Jama,* 305(13), pp. 1299-1301.

Whelan, P. J. & Remski, K., 2012. Buprenorphine vs methadone treatment: A review of evidence in both developed and developing worlds. *Journal of Neurosciences in Rural Practice,* 3(01), pp. 45-50.

Whiteford, H. A. et al., 2015. The global burden of mental, neurological and substance use disorders: an analysis from the Global Burden of Disease Study 2010. *PLoS one,* 10(2), p. e0116820.

WHO, 2006. *Lexicon of Alcohol and Drug Terms Published by the World Health Organization,* s.l.: WHO.

WHO, 2021. *Drugs (psychoactive).* [Online] Available at: https://www.who.int/health-topics/drugs-psychoactive#tab=tab_1 [Accessed 6 June 2021].

Yokell, M., Zaller, N., Green, T. & Rich, J., 2011. Buprenorphine and buprenorphine/naloxone diversion, misuse, and illicit use: an international review. *Current drug abuse reviews,* 4(1), pp. 28-41.

Zhou, K. et al., 2017. Relationships between perceived social support and retention among patients in methadone maintenance treatment in mainland China. *Psychology, health & medicine,* 22(4), pp. 493-500."

APPENDICES

Appendix 1: Descriptives & Frequencies

Appendix 2: Wilcoxon Ranked Test Data

Appendix 3: Chi Square Test of Independence

Appendix 4: Bivariate Correlation

Appendix 5: Gibbs (1988) Reflective Cycle

Appendix 6: COWS Chart

9.1 Appendix 1: Descriptives & Frequencies

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Age	200	34	21	55	31.99	7.751
COWS_1st_day	200	28	0	28	10.01	4.716
COWS_2nd_day	193	31	1	32	10.33	4.837
COWS_3rd_day	176	20	0	20	6.48	3.533
COWS_2nd_week	100	15	0	15	2.97	2.368
Pain_Score_1st_day	200	8	0	8	1.96	2.243
Pain_Score_2nd_day	166	8	0	8	2.37	2.178
Pain_Score_3rd_day	158	8	0	8	1.84	2.110
Pain_Score_2nd_Week	114	7	0	7	.44	1.311
Length_of_stay_days	200	38	2	40	14.30	8.629
Valid N (listwise)	78					

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Drug_level_in_urine	24	1247	132	1379	669.75	376.306
Valid N (listwise)	24					

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	16	8.0	8.0	8.0
	male	6	3.0	3.0	11.0
	Male	178	89.0	89.0	100.0
	Total	200	100.0	100.0	

Nationality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bahrain	5	2.5	2.5	2.5
	Comoros	6	3.0	3.0	5.5
	KSA	3	1.5	1.5	7.0
	Kuwaiti	1	.5	.5	7.5
	Omani	2	1.0	1.0	8.5
	UAE	181	90.5	90.5	99.0
	Yemeni	2	1.0	1.0	100.0
	Total	200	100.0	100.0	

Marital_Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	77	38.5	38.5	38.5
	Single	123	61.5	61.5	100.0
	Total	200	100.0	100.0	

Level_of_Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	18	9.0	9.0	9.0
	Diploma	8	4.0	4.0	13.0
	Preparat	52	26.0	26.0	39.0
	Primary	35	17.5	17.5	56.5
	Secondar	87	43.5	43.5	100.0
	Total	200	100.0	100.0	

Recieved_PRN_Medication_for_Insomnia

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	9	4.5	4.5	4.5
	yes	191	95.5	95.5	100.0
	Total	200	100.0	100.0	

Mode_of_Discharge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DAMA	132	66.0	66.0	66.0
	Regular	68	34.0	34.0	100.0
	Total	200	100.0	100.0	

Recieved_PRN_medication_for_pain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	44	22.0	22.0	22.0
	yes	156	78.0	78.0	100.0
	Total	200	100.0	100.0	

Redmission_on_the_same_year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	112	56.0	56.0	56.0
	YES	88	44.0	44.0	100.0
	Total	200	100.0	100.0	

Recieved_Suboxone_Protocol

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	8	4.0	4.0	4.0
	yes	192	96.0	96.0	100.0
	Total	200	100.0	100.0	

9.2 Appendix 2: Wilcoxon Ranked Test

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
COWS_1st_day	200	10.01	4.716	0	28
Pain_Score_1st_day	200	1.96	2.243	0	8
COWS_2nd_week	100	2.97	2.368	0	15
Pain_Score_2nd_Week	114	.44	1.311	0	7

Ranks

		N	Mean Rank	Sum of Ranks
COWS_2nd_week - COWS_1st_day	Negative Ranks	90[a]	49.93	4494.00
	Positive Ranks	5[b]	13.20	66.00
	Ties	5[c]		
	Total	100		
Pain_Score_2nd_Week - Pain_Score_1st_day	Negative Ranks	49[d]	32.49	1592.00
	Positive Ranks	10[e]	17.80	178.00
	Ties	55[f]		
	Total	114		

a. COWS_2nd_week < COWS_1st_day

b. COWS_2nd_week > COWS_1st_day

c. COWS_2nd_week = COWS_1st_day

d. Pain_Score_2nd_Week < Pain_Score_1st_day

e. Pain_Score_2nd_Week > Pain_Score_1st_day

f. Pain_Score_2nd_Week = Pain_Score_1st_day

Test Statistics[a]

	COWS_2nd_week - COWS_1st_day	Pain_Score_2nd_Week - Pain_Score_1st_day
Z	-8.234[b]	-5.413[b]
Asymp. Sig. (2-tailed)	.000	.000

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Ranks

		N	Mean Rank	Sum of Ranks
COWS_2nd_day - COWS_1st_day	Negative Ranks	103[a]	83.94	8646.00
	Positive Ranks	77[b]	99.27	7644.00
	Ties	13[c]		
	Total	193		
COWS_3rd_day - COWS_2nd_day	Negative Ranks	149[d]	87.44	13028.00
	Positive Ranks	16[e]	41.69	667.00
	Ties	11[f]		
	Total	176		
COWS_2nd_week - COWS_2nd_day	Negative Ranks	95[g]	51.66	4907.50
	Positive Ranks	4[h]	10.63	42.50
	Ties	1[i]		

	Total	100		
COWS_2nd_week - COWS_3rd_day	Negative Ranks	85[j]	50.55	4297.00
	Positive Ranks	11[k]	32.64	359.00
	Ties	2[l]		
	Total	98		
Pain_Score_2nd_day - Pain_Score_1st_day	Negative Ranks	42[m]	43.90	1844.00
	Positive Ranks	53[n]	51.25	2716.00
	Ties	71[o]		
	Total	166		
Pain_Score_3rd_day - Pain_Score_1st_day	Negative Ranks	54[p]	52.29	2823.50
	Positive Ranks	47[q]	49.52	2327.50
	Ties	57[r]		
	Total	158		
Pain_Score_2nd_Week - Pain_Score_2nd_day	Negative Ranks	53[s]	33.18	1758.50
	Positive Ranks	8[t]	16.56	132.50
	Ties	40[u]		
	Total	101		
Pain_Score_2nd_Week - Pain_Score_3rd_day	Negative Ranks	46[v]	30.59	1407.00
	Positive Ranks	9[w]	14.78	133.00
	Ties	48[x]		
	Total	103		

a. COWS_2nd_day < COWS_1st_day

b. COWS_2nd_day > COWS_1st_day

c. COWS_2nd_day = COWS_1st_day

d. COWS_3rd_day < COWS_2nd_day

e. COWS_3rd_day > COWS_2nd_day

f. COWS_3rd_day = COWS_2nd_day

g. COWS_2nd_week < COWS_2nd_day

h. COWS_2nd_week > COWS_2nd_day

i. COWS_2nd_week = COWS_2nd_day

j. COWS_2nd_week < COWS_3rd_day

k. COWS_2nd_week > COWS_3rd_day

l. COWS_2nd_week = COWS_3rd_day

m. Pain_Score_2nd_day < Pain_Score_1st_day

n. Pain_Score_2nd_day > Pain_Score_1st_day

o. Pain_Score_2nd_day = Pain_Score_1st_day

p. Pain_Score_3rd_day < Pain_Score_1st_day

q. Pain_Score_3rd_day > Pain_Score_1st_day

r. Pain_Score_3rd_day = Pain_Score_1st_day

s. Pain_Score_2nd_Week < Pain_Score_2nd_day

t. Pain_Score_2nd_Week > Pain_Score_2nd_day

u. Pain_Score_2nd_Week = Pain_Score_2nd_day

v. Pain_Score_2nd_Week < Pain_Score_3rd_day

w. Pain_Score_2nd_Week > Pain_Score_3rd_day

x. Pain_Score_2nd_Week = Pain_Score_3rd_day

Test Statistics[a]

	COWS_2nd_day - COWS_1st_day	COWS_3rd_day - COWS_2nd_day	COWS_2nd_week - COWS_2nd_day	COWS_2nd_week - COWS_3rd_day	Pain_Score_2nd_day - Pain_Score_1st_day	Pain_Score_3rd_day - Pain_Score_1st_day	Pain_Score_2nd_Week - Pain_Score_2nd_day	Pain_Score_2nd_Week - Pain_Score_3rd_day
Z	-.717[b]	-10.077[b]	-8.499[b]	-7.215[b]	-1.629[c]	-.845[b]	-5.896[b]	-5.380[b]
Asymp. Sig. (2-tailed)	.473	.000	.000	.000	.104	.398	.000	.000

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

c. Based on negative ranks.

9.3 Appendix 3: Chi Square Test of Independence

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Recieved_Suboxone_Protocol * Mode_of_Discharge	200	100.0%	0	0.0%	200	100.0%

Recieved_Suboxone_Protocol * Mode_of_Discharge Crosstabulation

			Mode_of_Discharge		
			DAMA	Regular	Total
Recieved_Suboxone_Protocol	No	Count	5	3	8
		Expected Count	5.3	2.7	8.0
		% within Recieved_Suboxone_Protocol	62.5%	37.5%	100.0%
		% within Mode_of_Discharge	3.8%	4.4%	4.0%
		% of Total	2.5%	1.5%	4.0%
	yes	Count	127	65	192
		Expected Count	126.7	65.3	192.0
		% within Recieved_Suboxone_Protocol	66.1%	33.9%	100.0%
		% within Mode_of_Discharge	96.2%	95.6%	96.0%
		% of Total	63.5%	32.5%	96.0%
Total		Count	132	68	200
		Expected Count	132.0	68.0	200.0

	% within Recieved_Suboxone_Protocol	66.0%	34.0%	100.0%
	% within Mode_of_Discharge	100.0%	100.0%	100.0%
	% of Total	66.0%	34.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.045[a]	1	.831		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.045	1	.832		
Fisher's Exact Test				1.000	.550
N of Valid Cases	200				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 2.72.

b. Computed only for a 2x2 table

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Recieved_PRN_Medication_for_Insomnia * Mode_of_Discharge	200	100.0%	0	0.0%	200	100.0%

Recieved_PRN_medication_for_pain * Mode_of_Discharge	200	100.0%	0	0.0%	200	100.0%

Crosstab

			Mode_of_Discharge		
			DAMA	Regular	Total
Recieved_PRN_Medication_for_Insomnia	No	Count	7	2	9
		Expected Count	5.9	3.1	9.0
		% within Recieved_PRN_Medication_for_Insomnia	77.8%	22.2%	100.0%
		% within Mode_of_Discharge	5.3%	2.9%	4.5%
		% of Total	3.5%	1.0%	4.5%
	yes	Count	125	66	191
		Expected Count	126.1	64.9	191.0
		% within Recieved_PRN_Medication_for_Insomnia	65.4%	34.6%	100.0%
		% within Mode_of_Discharge	94.7%	97.1%	95.5%
		% of Total	62.5%	33.0%	95.5%
Total		Count	132	68	200
		Expected Count	132.0	68.0	200.0
		% within Recieved_PRN_Medication_for_Insomnia	66.0%	34.0%	100.0%
		% within Mode_of_Discharge	100.0%	100.0%	100.0%
		% of Total	66.0%	34.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.583[a]	1	.445		
Continuity Correction[b]	.163	1	.687		
Likelihood Ratio	.624	1	.430		
Fisher's Exact Test				.721	.357
N of Valid Cases	200				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.06.

b. Computed only for a 2x2 table

Crosstab

			Mode_of_Discharge		
			DAMA	Regular	Total
Recieved_PRN_medication_for_pain	No	Count	26	18	44
		Expected Count	29.0	15.0	44.0
		% within Recieved_PRN_medication_for_pain	59.1%	40.9%	100.0%
		% within Mode_of_Discharge	19.7%	26.5%	22.0%
		% of Total	13.0%	9.0%	22.0%
	yes	Count	106	50	156
		Expected Count	103.0	53.0	156.0

	% within Recieved_PRN_medication_for_pain	67.9%	32.1%	100.0%
	% within Mode_of_Discharge	80.3%	73.5%	78.0%
	% of Total	53.0%	25.0%	78.0%
Total	Count	132	68	200
	Expected Count	132.0	68.0	200.0
	% within Recieved_PRN_medication_for_pain	66.0%	34.0%	100.0%
	% within Mode_of_Discharge	100.0%	100.0%	100.0%
	% of Total	66.0%	34.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.200[a]	1	.273		
Continuity Correction[b]	.838	1	.360		
Likelihood Ratio	1.176	1	.278		
Fisher's Exact Test				.284	.180
N of Valid Cases	200				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.96.

b. Computed only for a 2x2 table

9.4 Appendix 4: Bivariate Correlation

Correlations

		Gender	Nationality	Marital_Status	Level_of_Education	Drug_Test	Drug_level_in_urine	Recieved_Suboxone_Protocol	Recieved_PRN_Medication_for_Insomnia	Recieved_PRN_medication_for_pain	Length_of_stay_days	Redmission_on_the_same_year
Gender	Pearson Correlation	1	.082	.029	.029	.[a]	-.060	.034	-.064	.066	-.076	-.110
	Sig. (2-tailed)		.247	.679	.679	.	.781	.634	.368	.354	.288	.121
	N	200	200	200	200	0	24	200	200	200	200	200
Nationality	Pearson Correlation	.082	1	-.145*	-.145*	.[a]	-.264	-.112	-.031	.023	-.011	.010
	Sig. (2-tailed)	.247		.041	.041	.	.213	.114	.666	.751	.881	.889
	N	200	200	200	200	0	24	200	200	200	200	200
Marital_Status	Pearson Correlation	.029	-.145*	1	1.000**	.[a]	-.056	.000	.022	.130	-.002	.000
	Sig. (2-tailed)	.679	.041		.000	.	.795	1.000	.761	.066	.982	1.000
	N	200	200	200	200	0	24	200	200	200	200	200
Level_of_Education	Pearson Correlation	.029	-.145*	1.000**	1	.[a]	-.056	.000	.022	.130	-.002	.000
	Sig. (2-tailed)	.679	.041	.000		.	.795	1.000	.761	.066	.982	1.000
	N	200	200	200	200	0	24	200	200	200	200	200
Drug_Test	Pearson Correlation	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]	.[a]
	Sig. (2-tailed)	.	.	.	.		.	.	.	.	.	.
	N	0	0	0	0	0	0	0	0	0	0	0
Drug_level_in_urine	Pearson Correlation	-.060	-.264	-.056	-.056	.[a]	1	.499*	.019	-.274	.332	.091
	Sig. (2-tailed)	.781	.213	.795	.795	.		.013	.929	.194	.113	.672
	N	24	24	24	24	0	24	24	24	24	24	24
Recieved_Suboxone_Protocol	Pearson Correlation	.034	-.112	.000	.000	.[a]	.499*	1	.325**	.200**	.078	.078
	Sig. (2-tailed)	.634	.114	1.000	1.000	.	.013		.000	.005	.271	.271
	N	200	200	200	200	0	24	200	200	200	200	200
Recieved_PRN_Medication_for_Insomnia	Pearson Correlation	-.064	-.031	.022	.022	.[a]	.019	.325**	1	.176*	.184**	-.002
	Sig. (2-tailed)	.368	.666	.761	.761	.	.929	.000		.013	.009	.978
	N	200	200	200	200	0	24	200	200	200	200	200
Recieved_PRN_medication_for_pain	Pearson Correlation	.066	.023	.130	.130	.[a]	-.274	.200**	.176*	1	-.003	.033
	Sig. (2-tailed)	.354	.751	.066	.066	.	.194	.005	.013		.968	.642
	N	200	200	200	200	0	24	200	200	200	200	200
Length_of_stay_days	Pearson Correlation	-.076	-.011	-.002	-.002	.[a]	.332	.078	.184**	-.003	1	.041
	Sig. (2-tailed)	.288	.881	.982	.982	.	.113	.271	.009	.968		.564
	N	200	200	200	200	0	24	200	200	200	200	200

Redmission_on_the_same_year	COWS_1st_day	COWS_2nd_day	COWS_3rd_day	COWS_2nd_week	Pain_Score_1st_day	Pain_Score_2nd_day	Pain_Score_3rd_day	Pain_Score_2nd_Week	Age
-.110	.153*	.024	.088	.095	.078	-.113	.114	-.228*	.028
.121	.030	.738	.244	.348	.274	.147	.152	.014	.694
200	200	193	176	100	200	166	158	114	200
.010	-.077	-.060	-.027	-.017	.006	.036	-.009	-.004	-.073
.889	.279	.409	.718	.868	.927	.642	.914	.963	.301
200	200	193	176	100	200	166	158	114	200
.000	.069	-.002	.045	-.094	-.002	.141	-.092	-.052	.185**
1.000	.329	.983	.555	.354	.977	.069	.252	.581	.009
200	200	193	176	100	200	166	158	114	200
.000	.069	-.002	.045	-.094	-.002	.141	-.092	-.052	.185**
1.000	.329	.983	.555	.354	.977	.069	.252	.581	.009
200	200	193	176	100	200	166	158	114	200
.a	.a	.a	.a	.a	.a	.a	.a	.a	.a
.	.	.	.	.	.	.	.	.	.
0	0	0	0	0	0	0	0	0	0
.091	.287	-.193	-.098	-.106	-.229	-.136	-.077	-.036	-.190
.672	.174	.378	.681	.771	.281	.578	.755	.892	.374
24	24	23	20	10	24	19	19	17	24
.078	.299**	.275**	.167*	.127	.122	.152	.107	-.071	.026
.271	.000	.000	.027	.209	.085	.050	.182	.455	.715
200	200	193	176	100	200	166	158	114	200
-.002	.195**	.007	.111	-.032	.126	.137	.141	.045	.009
.978	.006	.919	.143	.751	.075	.078	.077	.635	.900
200	200	193	176	100	200	166	158	114	200
.033	.127	.117	.144	.113	.423**	.534**	.318**	.169	-.010
.642	.073	.105	.056	.264	.000	.000	.000	.072	.884
200	200	193	176	100	200	166	158	114	200
.041	-.028	-.219**	-.214**	-.143	-.001	.020	.047	.081	-.131
.564	.693	.002	.004	.155	.994	.795	.558	.389	.064
200	200	193	176	100	200	166	158	114	200

Redmission_on_the_same_year	Pearson Correlation	-.110	.010	.000	.000	.[a]	.091	.078	-.002	.033	.041	1
	Sig. (2-tailed)	.121	.889	1.000	1.000	.	.672	.271	.978	.642	.564	
	N	200	200	200	200	0	24	200	200	200	200	200
COWS_1st_day	Pearson Correlation	.153*	-.077	.069	.069	.[a]	.287	.299**	.195**	.127	-.028	.073
	Sig. (2-tailed)	.030	.279	.329	.329	.	.174	.000	.006	.073	.693	.304
	N	200	200	200	200	0	24	200	200	200	200	200
COWS_2nd_day	Pearson Correlation	.024	-.060	-.002	-.002	.[a]	-.193	.275**	.007	.117	-.219**	.023
	Sig. (2-tailed)	.738	.409	.983	.983	.	.378	.000	.919	.105	.002	.752
	N	193	193	193	193	0	23	193	193	193	193	193
COWS_3rd_day	Pearson Correlation	.088	-.027	.045	.045	.[a]	-.098	.167*	.111	.144	-.214**	.071
	Sig. (2-tailed)	.244	.718	.555	.555	.	.681	.027	.143	.056	.004	.350
	N	176	176	176	176	0	20	176	176	176	176	176
COWS_2nd_week	Pearson Correlation	.095	-.017	-.094	-.094	.[a]	-.106	.127	-.032	.113	-.143	-.047
	Sig. (2-tailed)	.348	.868	.354	.354	.	.771	.209	.751	.264	.155	.643
	N	100	100	100	100	0	10	100	100	100	100	100
Pain_Score_1st_day	Pearson Correlation	.078	.006	-.002	-.002	.[a]	-.229	.122	.126	.423**	-.001	.036
	Sig. (2-tailed)	.274	.927	.977	.977	.	.281	.085	.075	.000	.994	.609
	N	200	200	200	200	0	24	200	200	200	200	200
Pain_Score_2nd_day	Pearson Correlation	-.113	.036	.141	.141	.[a]	-.136	.152	.137	.534**	.020	.007
	Sig. (2-tailed)	.147	.642	.069	.069	.	.578	.050	.078	.000	.795	.930
	N	166	166	166	166	0	19	166	166	166	166	166
Pain_Score_3rd_day	Pearson Correlation	.114	-.009	-.092	-.092	.[a]	-.077	.107	.141	.318**	.047	-.121
	Sig. (2-tailed)	.152	.914	.252	.252	.	.755	.182	.077	.000	.558	.129
	N	158	158	158	158	0	19	158	158	158	158	158
Pain_Score_2nd_Week	Pearson Correlation	-.228*	-.004	-.052	-.052	.[a]	-.036	-.071	.045	.169	.081	-.029
	Sig. (2-tailed)	.014	.963	.581	.581	.	.892	.455	.635	.072	.389	.763
	N	114	114	114	114	0	17	114	114	114	114	114
Age	Pearson Correlation	.028	-.073	.185**	.185**	.[a]	-.190	.026	.009	-.010	-.131	-.011
	Sig. (2-tailed)	.694	.301	.009	.009	.	.374	.715	.900	.884	.064	.874
	N	200	200	200	200	0	24	200	200	200	200	200

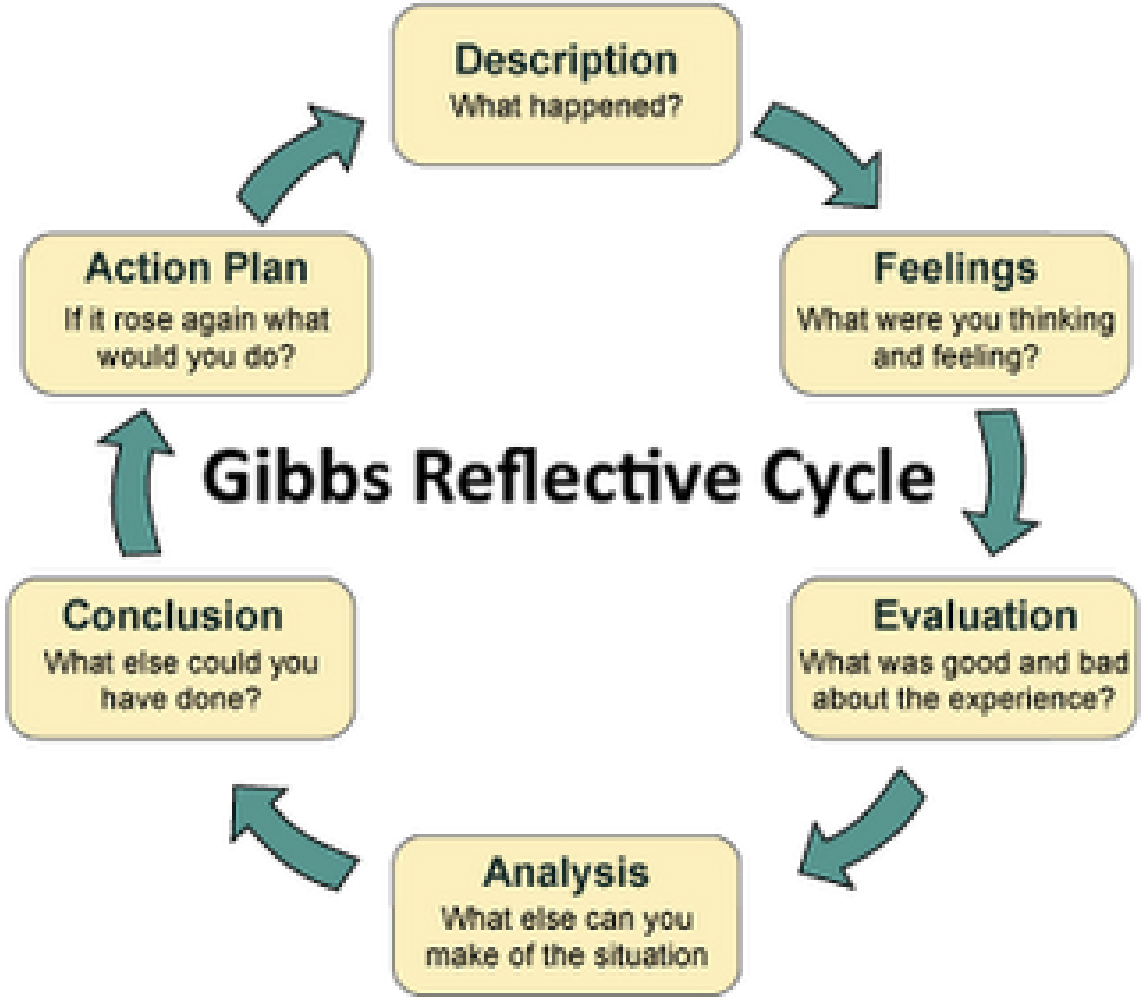
*. Correlation is significant at the 0.05 level (2-tailed).

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

a. Cannot be computed because at least one of the variables is constant.

.073	.023	.071	-.047	.036	.007	-.121	-.029	-.011
.304	.752	.350	.643	.609	.930	.129	.763	.874
200	193	176	100	200	166	158	114	200
1	.122	.106	.051	.266**	.071	.093	.023	.135
	.090	.163	.611	.000	.365	.244	.806	.057
200	193	176	100	200	166	158	114	200
.122	1	.590**	.014	.158*	.288**	.191*	-.019	.258**
.090		.000	.890	.028	.000	.016	.840	.000
193	193	176	100	193	164	157	114	193
.106	.590**	1	.286**	.211**	.248**	.258**	.048	.222**
.163	.000		.004	.005	.002	.001	.622	.003
176	176	176	98	176	156	153	110	176
.051	.014	.286**	1	.187	.091	.231*	.297**	.173
.611	.890	.004		.063	.396	.030	.004	.086
100	100	98	100	100	89	89	95	100
.266**	.158*	.211**	.187	1	.184*	.090	.018	.092
.000	.028	.005	.063		.017	.263	.851	.196
200	193	176	100	200	166	158	114	200
.071	.288**	.248**	.091	.184*	1	.267**	.017	-.048
.365	.000	.002	.396	.017		.001	.868	.540
166	164	156	89	166	166	142	101	166
.093	.191*	.258**	.231*	.090	.267**	1	.228*	-.044
.244	.016	.001	.030	.263	.001		.021	.586
158	157	153	89	158	142	158	103	158
.023	-.019	.048	.297**	.018	.017	.228*	1	-.011
.806	.840	.622	.004	.851	.868	.021		.909
114	114	110	95	114	101	103	114	114
.135	.258**	.222**	.173	.092	-.048	-.044	-.011	1
.057	.000	.003	.086	.196	.540	.586	.909	
200	193	176	100	200	166	158	114	200

9.5 Appendix 5: Gibbs (1988) Reflective Cycle



9.6 Appendix 6: COWS Score Chart

Sign or Symptom	Score
Resting pulse rate measured after patient has been sitting or lying for 1 min – beats/min	
<80	0
81-100	1
101-120	2
>120	4
Sweating during past half hr not accounted for by room temperature or physical activity	
No report of chills or flushing	0
Subjective report of chills or flushing	1
Flushed or observable moisture on face	2
Beads of sweat on brow or face	3
Sweat streaming off face	4
Restlessness observed during assessment	
Patient able to sit still	0
Patient reports difficulty sitting still but is able to do so	1
Frequent shifting or extraneous movements of legs and arms	3
Patient unable to sit still for more than a few seconds	5
Pupil Size	
Normal size for room light	0
Possibly larger than normal for room light	1
Moderately dilated	2
So dilated that only rim of iris is visible	5
Bone or joint aches	
None	0
Mild, diffuse discomfort	1
Severe diffuse aching of joints, muscles, or both	2
Patient is rubbing joints or muscles and is unable to sit still because of discomfort	4
Runny nose or tearing not accounted for by cold symptoms or allergies	
None	0
Nasal stuffiness or unusually moist eyes	1
Nose running or tearing	2
Nose constantly running or tears streaming down cheeks	4
Gastrointestinal upset during past half hr	
None	0
Stomach cramps	1
Nausea or loose stool	2
Vomiting or diarrhoea	3
Multiple episodes of diarrhoea or vomiting	5
Tremor in outstretched hands	

None	0
Tremor can be felt but not observed	1
Slight tremor observable	2
Gross tremor or muscle twitching	4
Yawning observed during assessment	
None	0
Once or twice during assessment	1
Three or more times during assessment	2
Several times/min	4
Anxiety or irritability	
None	0
Patients reports increasing irritability or anxiousness	1
Patient obviously irritable or anxious	2
Patient so irritable or anxious that participation in assessment is difficult	4
Piloerection	
Skin is smooth	0
Piloerection of skin can be felt or hairs standing up on arms	3
Prominent piloerection	5