

IMPLEMENTATION OF AN ADDICTION SEVERITY INDEX EDUCATION
LECTURE AT MARANA INTEGRATIVE HEALTHCARE

by

Tommie Lee Butler

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Tommie Lee Butler, titled Implementation of an Addiction Severity Index Education Lecture at Marana Integrative Healthcare and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

Sara J. Edmund

Sara J. Edmund, DNP, RN, FNP-C, PMHNP-BC
Date: Nov 16, 2020

Lindsay Ann Bouchard

Lindsay Ann Bouchard, DNP, PMHNP-BC, RN
Date: Nov 16, 2020

Shawn Patrick Gallagher

Shawn Patrick Gallagher, PhD, PMHCNS-BC, APRN-BC, FNP-BC
Date: Nov 16, 2020

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

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

Sara J. Edmund

Sara J. Edmund, DNP, RN, FNP-C, PMHNP-BC
DNP Project Committee Chair
College of Nursing
Date: Nov 16, 2020



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I have received more from life than I deserve; having the opportunity to pursue higher education is one of many examples of this. Thank you to my family, friends, faculty, and preceptors for making this pursuit possible. I appreciate your unrelenting faith in me.

DEDICATION

This project is dedicated to my family and committee faculty. I would not be here without their support.

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ABSTRACT

Purpose: This quality improvement project aimed to increase provider and staff knowledge at an integrated care organization of the addiction severity index screener and their intention to use the instrument to manage opiate use disorder patient treatment.

Background: American opiate use disorder prevalence has led to unprecedented public health concerns, crippling treatment expenses, and growing death tolls to create a national crisis. Of the 67,367 substance-related mortalities in 2018 alone, 70% (46,802 overdoses) involved opioids, putting into perspective the drug class' pervasive nature. Several treatment solutions have been trialed but often fail to adequately address opiate users' complex social and medical demands that necessitate more intensive care. The addiction severity index is a research-supported method of identifying and measuring these problem areas related to drug usage to provide more intuitive addiction treatment management.

Methods: This project applied a one-group, asynchronous, pretest-posttest quantitative design that assessed participants' addiction severity index knowledge and intention to use the tool before and after interventional learning. An online PowerPoint presentation delivered the intervention to six healthcare professionals that were anticipated to utilize the tool's collected data for their patient care duties. Email instructions directed interested participants to Qualtrics to take a 17-item pretest, complete the intermediate addiction severity index training, and finish with a 19-item post-test. Both surveys collected demographic, multiple-choice, and Likert survey data. The total time commitment was 45-minutes, and access to the training was available for two weeks.

Results: The six participants' pre- to post-test correctly answered multiple-choice questions measuring addiction severity index knowledge increased from 47.2% to 75% (+27.8% increase). Improvement was also captured in participants' cumulative Likert votes of 'strongly agree' intention to use the instrument from 16 (pre-test) to 28 (post-test) votes (+12 votes; 14.3% increase).

Conclusions: Conveying the addiction severity index's relative advantage in addiction treatment proved sufficient to favorably change the provider and staff's attitude and behaviors towards the intervention. The implications of these findings suggest that increased use of the screening tool is likely, and subsequently, will promote improved opiate use disorder patient safety.

INTRODUCTION

The pharmacological drug class known as opioids, spanning several natural and synthetic substance derivatives (codeine, oxycodone, fentanyl, hydrocodone, heroin, & morphine), has impacted public safety to the point of becoming an epidemic (Mcelrath & Joseph, 2018; National Institute on Drug Abuse [NIDA], 2019a). As of 2017, addiction affected an estimated 1.9 million United States (U.S.) residents, causing them to develop prescription analgesic substance-use disorders (SUD), 586,000 of which resulted in heroin addiction (Ali et al., 2017). This transition to intravenous substance use not only raises the chance of blood borne infections including human immunodeficiency (HIV) and hepatitis C (HCV), but opioids are considered the primary drug linked to overdose deaths (Mcelrath & Joseph, 2018; United Nations Office on Drugs and Crime [UNODC], 2017). Proof of opioid potency is outlined by the rising yearly opiate overdose death rates from 1999 to 2017 that has claimed over 700,000 American lives despite healthcare's best attempts to halt its progress (Centers for Disease Control & Prevention [CDC], 2018b). The economic aftermath of this threat is no small burden either, costing the U.S. \$78.5 billion annually (NIDA, 2019c). In response, several promising solutions have been tested and implemented, such as prescription drug monitoring programs (PDMP) and medication-assisted treatment (MAT) (Mcelrath & Joseph, 2018). Both are further described in detail, but this project aimed to implement one such solution called the addiction severity index (ASI).

Background Knowledge

Dried extracts of opium exudate found in *papaver somniferum* (poppy) seedpods have been in use for thousands of years (Van Hout & Hearne, 2015). This use has continued to modern America, with approximately 300,000 people addicted to opiates at the beginning of the

1900s (Goodwin, 1989). A common medicinal opiate at the beginning 20th century known as laudanum was an acceptable consumable among the working class to often addicted middle-class women (Goodwin, 1989; Van Hout & Hearne, 2015). Contributing factors to this addiction were the issues of indiscriminate sales, excessive social consumption, and the fact that laudanum poisoning did not come under scrutiny until the late 19th century after its use was already normalized (Van Hout & Hearne, 2015). It was not until the 1914 Harrison Act that made narcotic possession (cocaine, opiates, & later, marijuana) punishable by law with hospital-jail time was social behavior affected (Goodwin, 1989). Substance abuse is better understood today beyond criminal conduct by the use of the Diagnostic and Statistical Manual of Mental Disorders (DSM).

The DSM-IV (4th ed.) created distinctions between substance-induced disorders and mental conditions when treating co-occurrence (Nunes & Rounsaville, 2006). The more precise guidelines gave providers a better understanding of prognosis and treatment when psychiatric syndromes were substance-induced, as well as when the syndrome was substance use independent (Nunes & Rounsaville, 2006). The current DSM-V (5th ed.) furthers opioid use disorder (OUD) understanding by specifying five main categories: opioid intoxication, induced-disorders, withdrawal, an unspecified related disorder, and use disorder (American Psychiatric Association [APA], 2013). Clients are diagnosed with an OUD based on exhibiting two of 11 diagnostic criteria within 12 months (APA, 2013). The requirements for diagnosis include: greater/longer use than intended, unsuccessful cessation history, increased length of time used on drug-related activities, having cravings, unfulfilled responsibilities due to use, use despite consequences (social, physical & mental), using substances instead of other important or

enjoyable activities, increased tolerance, and symptoms of drug withdrawal when abstinent (APA, 2013). Equally, different treatment measures are needed to address the complicated opiate disorder spectrum that was responsible for 67.8% (47,600 deaths) of U.S. drug overdoses in 2017 (CDC, 2018a).

Prescription Drug Monitoring Programs

North America opiate misuse has run rampant due to poor prescription practices. Consequences are seen in 8-12% of prescription opiate users developing an OUD and 80% of current heroin users identifying prescription abuse as their gateway drug (NIDA, 2019c). In response to this issue, the state-level PDMPs were designed to collect and archive patients' prescription information when dispensed into electronic data banks (Rutkow, 2017). These PDMPs are available in 49 American states for authorized personnel to access for a better understanding of their client's prescription-controlled substance use (Rutkow, 2017). Literature supports providers who use these systems have a greater potential to adjust the number and prescribed dosage of opioid pain relievers (OPR) issued to patients (Rutkow, 2017). This safety precaution is a reasonable approach to minimize the risk of addiction in patients who will not benefit from extra pain medications.

Unfortunately, the effectiveness of state PDMPs in opiate overdose prevention has been called into question due to insufficient evidence proving otherwise (Green et al., 2015). One systematic review of 47 PDMP's online material determined 29 (62%) failed to address overdose as a focus of interest, six (12.8%) had overdose-related content, and only two had specific prevention tools on the subject (Green et al., 2015). An additional barrier to patient opiate treatment using the PDMP is that providers fail to regularly check the electronic databases in

most states (Leichtling et al., 2017). This underuse is not a fault of the monitoring program itself but may affect providers' prescribing decisions if they lack the PDMP's knowledge (Rutkow, 2017). Despite PDMP's contributions to managing the opiate epidemic, it is debatably less impactful than MAT.

Medication-Assisted Treatment

The most common opiate detox methodology trusted by psychiatric providers today is the gold-standard intervention, medication-assisted treatment (MAT) (Alinejad et al., 2015). MAT is a trifold care approach that entails using Food and Drug Administration (FDA) authorized medications, therapeutic counseling, and patient monitoring to reach positive detox outcomes (Maglione et al., 2018). In America, the FDA-MAT approved drugs are buprenorphine, suboxone (buprenorphine/naloxone), naltrexone, and methadone (Maglione et al., 2018). One example of which, known as methadone maintenance treatment (MMT), treats more than 750,000 opiate patients worldwide, with 250,000 receiving treatment in American psychiatric facilities alone (Alinejad et al., 2015). The drug is considered a mainstay OUD therapy option that boasts higher patient treatment retention, less illicit substance use, and reduced mortality risk (Chou et al., 2014).

The international dominance of MAT is second to no other detox intervention (Chou et al., 2014). Still, unfortunately, the successful execution of said treatment is not foolproof, as evidenced by consistent detox program dropouts and post-discharge relapse rates even while under MMT (Chou et al. 2014; Chang et al., 2016). Evidence of this can be seen in the direct link between methadone and one-third of opiate users' overdoses (Alinejad et al., 2015). Despite most of these overdoses being related to chronic pain management as opposed to the minority

receiving opiate addiction treatment, the drug's death rate increase being significantly higher than all other opioids is still an issue (Chou et al., 2014). The cardiotoxic effects of methadone can be a possible contributing factor to this mortality risk (Chou et al., 2014).

A 12-study systematic review concluded daily methadone intake could cause QT interval prolongation up to 12 milliseconds [ms] (Alinejad et al., 2015). Changing QT waves can also result in 9.4 ms differences after six months of MMT (Alinejad et al., 2015). Regular QT interval and QT dispersions are 400-440 ms and 30-60 ms respectfully (Alinejad et al., 2015). These narrow windows are vital to optimal cardiac functioning (Alinejad et al., 2015). They can result in prominent arrhythmic chance, such as the deadly torsade de pointes (TDP), when QT exceeds 500 ms (Alinejad et al., 2015). Even methadone's reduced risk of mortality has its limits in opiate patient care, giving even more credence to the need for more diversified addiction treatment assessments.

Addiction Severity Index Introduction

Developed by McLellan et al. (2006), in 1980 as a screening method to assess SUD patient's abuse patterns, the addiction severity index (ASI) continues to be an evidence-based practice (EBP) supported instrument for problem area identification and severity (McLellan et al., 2006; De Vries et al., 2015). The 200-item semi-structured interview achieves versatility by addressing problems related to both SUD and functional status in seven fields: legal status, drug use, psychiatric health, alcohol use, employment status, general health, and family and social relationships (De Vries et al., 2015; Thylstrup et al., 2018). These potential problem areas are assessed at admission and, subsequently, at interval follow-ups to calculate a new composite score (CS) in each interest area (McLellan et al., 2006). These scores are robust measures of a

patient's changed response to care between ASI assessments to gauge their severity level in that life area (McLellan et al., 2006). Considering SUD patients often struggle with family and social relationships, legality, financial issues, and overall health problems, the potential for the ASI to collect information that will be missed by less potent measures cannot be understated (Thylstrup et al., 2018). This missed data is crucial as it can limit a provider's awareness of the patient's needs, risk factors, and future potential outcomes (McLellan et al., 2006). For example, one study showed significantly higher drug court graduation rates among substance abusers with an ASI drug CS below threshold than those in the higher mild-moderate and severe categories (Shah et al., 2015). It can be safely assumed that tracking the severity of a patient's ASI score can assist interdisciplinary teams to better gauge a patient's future success from treatment (Thylstrup et al., 2018). Padyab et al. (2018) state that these CSs are powerful predictors for future mental health disorder hospitalizations, thereby allowing the ASI to also tap into the issue of readmission rates that cost psychiatric facilities \$7,200 on average (Agency for Healthcare Research and Quality [AHRQ], 2015).

The significance of this ASI intervention to not only positively impact patient safety but change how psychiatric advanced practice registered nurses (APRN) provide OUD treatment cannot be expressed enough. The consequences of poorly managed MAT can be severe, resulting in counterproductive detox outcomes that have even led to early patient mortalities (Chou et al. 2014). This ASI is an intervention that should be supported due to its treatment foresight and early detection strengths that can allow healthcare providers to tailor therapy plans based on the patient's needs to reduce unfavorable outcomes (Thylstrup et al., 2018). Prevention trained APN who are suited to capitalize on teachable client moments, called 'windows of opportunity,' can

integrate numerous treatment additives that both empower facility practice standards and reinforces the patient's self-management knowledge (Engelen et al., 2019).

Due to the increasing expectation of practitioners to employ evidence-based approaches, APRN-prepared professionals who are trained to complete assessments, diagnosis, diagnostic testing, and treatment prescribing autonomously are in an excellent position to accomplish this (Donald et al., 2015; Janevic et al., 2016). The APRN-prepared provider's role can be both complementary (augment existing services) or alternative (substitute services) (Janevic et al., 2016). Because of this, the ASI that assesses multiple problem areas and requires equally diverse disciplines and treatments to address the client's needs is uniquely enhanced by the APRN (McLellan et al., 2006). Transitioning between these two roles, APRN's can either reduce care costs and improve care quality (complementary) or decrease workforce shortages and lower care costs (alternative) (Janevic et al., 2016). In short, not only does their education level meet the requirements to order and administer the ASI, but also their role versatility makes them qualified to address the ASI treatment demands even in staff shortage facilities (Janevic et al., 2016).

Local Problem

The national emergency opiate epidemic has impacted Arizona with several public safety, political, and financial consequences. Arizonians have arguably felt this burden, with 928 opioid-involved deaths in 2017, rising an astonishing 76% since 2013 (NIDA, 2019b). The opiate derivative source of each death increase from 2012 to 2017 is attributed to synthetic opioids (excluding methadone), heroin, and prescriptions at 36-267, 101-334, and 414 deaths in 2017 respectfully (NIDA, 2019b). The highest Arizonian opiate-related deaths can be seen below in people ages 45-54, male sex, and white race (ADHS, 2018c).

Figure 1

Arizonian Opioid Deaths, Sex & Age

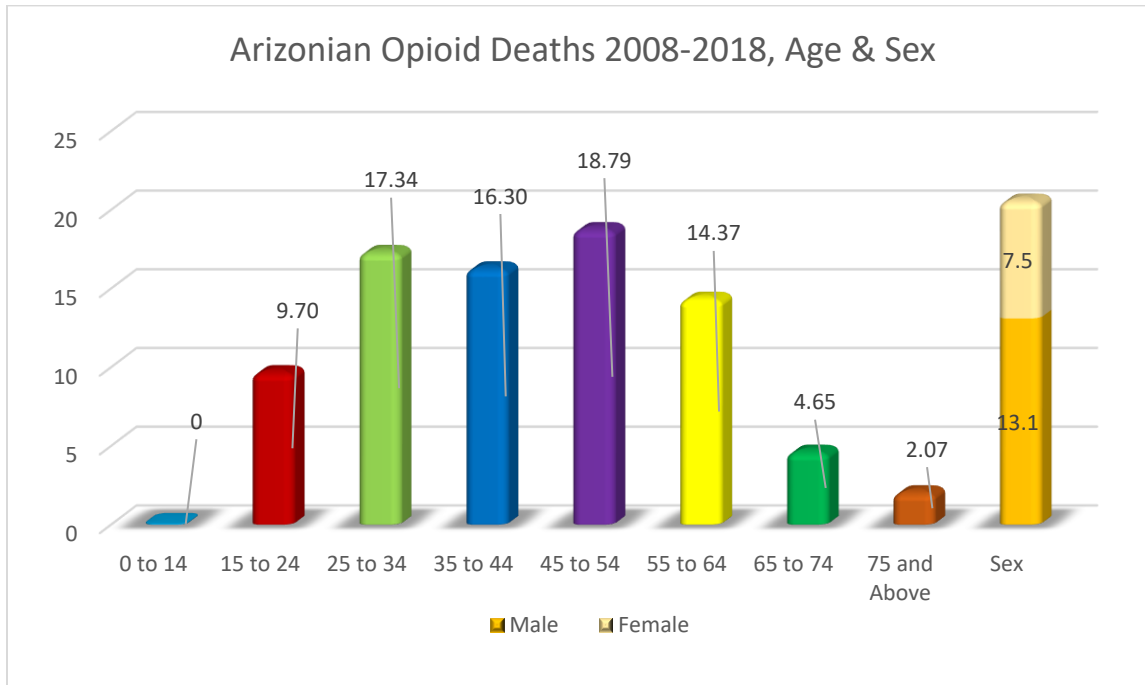
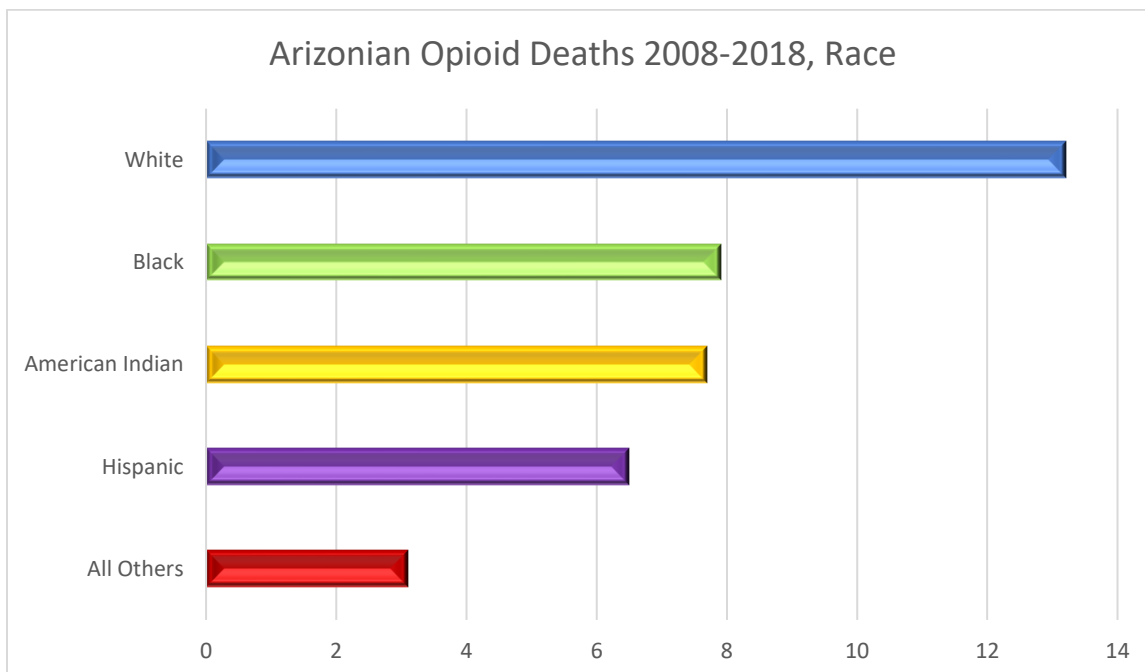


Figure 2

Arizonian Opioid Deaths, Race



These results put into perspective how troublesome it is that there were 205 million state-wide prescribed opioid pills in just seven months (January-July 2017) (ADHS, 2018a). This complicated relationship between prescription culture and opiate use made Arizona significant as one of the nation's fastest-growing states in drug overdose mortality rates (2016-2017) (CDC, 2018a). The financial burden of this death rate's upward trend has followed suit, increasing from \$143.6 million (18,592 opioid encounters) in 2008 to \$461.4 million (52,970 encounters) in 2018 (ADHS, 2018c). The 10-year timeline represents a 321% state-level expense increase and an estimated \$8,711 healthcare expense for every encounter in 2018 alone (ADHS, 2018c). Governor Doug Ducey responded to this threat by initiating the Opioid Action Plan on June 5, 2017, to increase public awareness, improve treatment access, strengthen prescription practices, decrease illicit drug spread, and reduce OUD deaths (ADHS, 2017); however, based on the data, more needs to be done, hence the mission of this quality improvement (QI) project.

Needs Assessment

Outpatient clinics are a promising and attractive location for OUD patients to receive treatment (Harris, 2015). One reason is the availability of buprenorphine, which, unlike methadone, can be prescribed in behavioral/primary care settings that are not federally licensed (Cushman et al., 2016). Another reason for this outpatient preference is to avoid the stigmatization that comes with being treated at federally licensed methadone clinics (Harris, 2015). For these reasons and more, buprenorphine-naloxone handles the vast majority of addiction care in America at an office-based setting (640,000 clients in 2009) (Otiashvili et al., 2013). This almost total treatment of opiate clients in outpatient facilities made these clinics a

prime candidate location to implement the ASI. This is especially true when handling complex OUD patients.

One study reported an increase of injection opiate user's post-hospitalization enrollment into outpatient clinics by 65% but retained only a 13.7% retention rate at six months (Cushman et al., 2016). These results mean buprenorphine alone was not enough to fulfill the patient's OUD treatment needs and stop them from injecting (Cushman et al., 2016). The researchers determined these injection users to likely have more complex social and medical demands that necessitate more intensive care (Cushman et al., 2016). The ASI QI education intended to be an intense treatment solution, which covered both general health and social in its seven domains that the researchers identified to be relevant (De Vries et al., 2015; Thylstrup et al., 2018).

Rural locations are particularly susceptible to the opiate epidemic due to several barriers that prevent timely treatment such as limited resources, insufficient hospital capacities, unavailable local mental health services, and severe personnel shortages (Rural Health Information Lab Hub [RHHub], 2019). When resources are inadequate to satisfy healthcare demands, to promote the facility's optimal performance, priority setting and resource allocation (PSRA) should be considered (Barasa et al., 2017). The rural outpatient of interest, Marana Health Center (MHC), further described below, could benefit from the ASI guided treatment plan that can direct resources to clients with the greatest needs based on their CS severity (Padyab et al. 2018). Empowering integrative care outpatient facilities by implementing the location appropriate and EBP ASI through a QI training session was the goal behind this project.

The MHC needed this ASI training to correct its current misuse of the tool. Negative word of mouth on the tool's perceived usefulness was the first sign that staff did not buy in to

using the intervention (Rogers, 1983, 2002). Multiple healthcare professionals from providers to staff could not verbalize what the ASI did or how it was being applied at the site upon questioning. This is a massive obstacle to proper evidence-based intervention (EBI) implementation because the basic knowledge necessary to improve their clinic's existing theoretical frameworks was missing (Janevic et al., 2016). When adapting EBIs under real-world conditions, facilities' existing services should be "retrofitted" to the intervention's components (Janevic et al., 2016). The ASI's CS are the components that needed to be united with current MHC OUD treatment services to accomplish this retrofitting (Janevic et al., 2016). This bridging between the two, MHC and ASI, was reportedly not fully understood by anyone at the site, so the knowledge and method needed to fulfill this need were addressed by interventional training.

Stakeholders

The World Health Organization (WHO) (WHO, 2020) endorses integrative care because it engages the unified collaborations of multiple health sectors and professionals to execute desired services. To achieve this same interconnectivity at the smaller outpatient clinic scale, vital internal stakeholders were identified to be physicians, caregivers, administrative staff, and patients (Bravi et al., 2013). For this QI project, providers were psychiatric professionals satisfied by medical doctors and nurse practitioners. Caregivers were the nursing, therapy, and staff that provide front-line care daily. Lastly, the administration included the psychiatry department chief and directors/managers (nursing & therapy). These people were critical drivers to the ASI's implementation and needed to be included, balanced, and respected to gain their consultation (Leviton & Melichar, 2016). Their professional experiences and knowledge

increased the ASI's diffusion and adoption, as well as the improved delivered care quality throughout the collaborating network (Bravi et al., 2013).

Intended Improvement

Project Purpose

The purpose of this QI project was to increase MHC provider and staff knowledge of the ASI tool and intention to use the instrument to manage SUD patient's care. Substance abuse is a multi-faceted disorder that results in mental, physical, and social impairment that no template solution can cure (Ljungvall et al., 2020). Because of this, thorough SUD treatment and management exceed initiating MAT alone, but requires rapport that supports a strong patient-provider partnership (Cushman et al., 2016). The ASI tool was the catalyst of this deeper rapport that examines addiction beyond the simple measurements of a client's substance of choice, quantity, and duration of use (McLellan et al., 2006). Interventional education emphasized the merit of this changed approach in substance abuse treatment, and most importantly, how MHC could better adapt and utilize the ASI instrument based on previous successful research. Quality improvement is any measurable change to a healthcare system that results in better outcomes (Hwang, & Park, 2015). This QI measure was engineered to focus on and expand from one singular practice question.

Project Question

In the MHC outpatient clinic, will a brief educational presentation about the ASI instrument increase provider and staff knowledge and intent to use in SUD patient's treatment?

Project Objectives

This QI project's objective was to increase MHC's interdisciplinary use of the ASI tool. The threat of unmet patient needs due to non-standardized practices are real, but can be avoided if given the necessary preventative attention. The following objectives describe this attention distributed throughout the ASI's care process.

Objective 1: Increase the knowledge of each provider and staff team member with the benefits of the ASI tool related to SUD patient information collection.

Objective 2: Increase the intent to use the ASI within MHC to standardize OUD patient management.

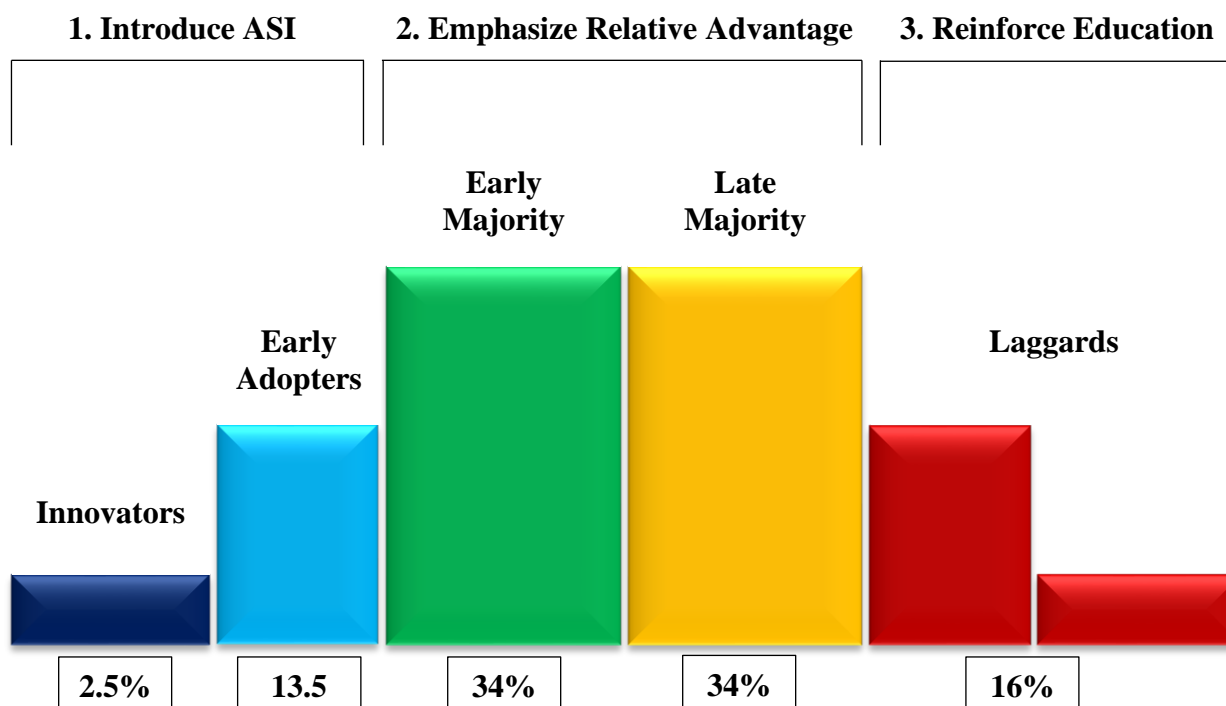
Objective 3: Increase the overall use of the ASI instrument within the practice to improve SUD treatment.

Theoretical Framework

The framework that directed this QI project was Rogers' diffusion of innovation (DOI) theory due to its strength in illustrating how new ideas disseminate through social systems (Emani et al., 2018; Rogers, 1983, 2002). Rogers defined the adoption rate for innovation based on five essential variables: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1983). Relative advantage is defined as stakeholders' perceived value of the innovation as superior to the procedures it is meant to replace (Rogers, 2002). The change needs to be seen as advantageous to get their support and participation (Rogers, 1983). Next, compatibility involves stakeholders' perceptions of the new ideas to be consistent with their current values, needs, and experiences (Rogers, 2002). Failure to align the two results in slow adoption and can possibly require a new value system to be enacted before the adoption (Rogers,

1983). Complexity is stakeholders' perceived ease of use and understanding of the new practice change (Emani et al., 2018). To increase adoption, more easily understood innovations that do not require stakeholders to develop new understandings and skills were used (Rogers, 1983). Trialability is how much experimentation can be done to the change in a limited time frame (Emani et al., 2018). Lastly, observability is how visible the innovation's results are to the stakeholders (Rogers, 2002). Ultimately, adoption is determined by stakeholder's perception as opposed to the attributes of the change; controlling this perception was vital to ensure the QI project's success (Emani et al., 2018).

Moving through social systems by communication networks, empirical research supports interpersonal communication and mass media channels as diffusion's primary modes of transport (Valente et al., 2015; Rogers, 2003). Whether through interpersonal or media communication, future adopters were exposed to the innovation that they later engaged in conversation about with their colleagues (Rogers, 2003). For this project, the interpersonal communication style was the focus of interest as mass media is considered less direct and powerful than previously thought (Rogers, 2003). Simply put, interpersonal communication is commonly known as word of mouth (WOM) contact (Rogers, 2003). This information exchange naturally occurred throughout the Marana outpatient social system to influence the ASI's adoption rate among five types of adopters: innovators, early adopters, early majority, late majority, and laggards (Rogers, 1983). Innovators are the fastest to accept change, while laggards are the slowest (Rogers, 2003). This diffusion is graphically represented by the sociological pioneer Gabriel Tarde's discovery that the adoption rate forms an S-curve (Figure 3) (Srivastava & Moreland, 2012).

Figure 3*Roger's Theory of Diffusion of Innovation*

The curve has three stages: 1) slow initial diffusion, 2) strong diffusion, and 3) diffusion that slows before stopping (Tarde & Clark, 1969). Because the psychological and behavioral components of marketing make negative WOM through social channels more potent than positive WOM, it was vital to guide Marana staff's perception of the change towards optimism for rapid diffusion to occur (Chen et al., 2011; Rogers, 1983). This optimism was spearheaded by educating and convincing the healthcare professionals of the relative advantage of the ASI tools newly proposed implementation plan compared to currently used measures. Relative advantage was the force that inspired change, while positive WOM acted as the communication channel to deliver the message (Rogers, 1983, 2002).

Procuring the rural staff's buy-in through positive WOM of the relative advantage who are more likely to trust one another than an outsider implementing the change corresponds with the DOI's teachings (Rogers, 1983). Favorable attitudes alone did not guarantee innovation adoption, however (Rodgers, 2003). Instead, this attitude could be used to set-up future adoption decision activities (Rodgers, 2003). These activities exposed willing participants to enough innovation experience for them to either accept or reject the new idea (Rodgers, 2003). Partial basis trialability is an effective strategy to convince even uncertain adopters to try the innovation (i.e., ASI instrument) temporarily (Rodgers, 2003). New ideas that are trialed before implementation typically have more rapid acceptance rates (Rodgers, 2003). If relative advantage is perceived during this test period, an adoption decision is likely to follow (Rodgers, 2003). Based on positive WOM, the activity's execution quality, and seen relative advantage, the goal of the DOI's use in this project was to have staff make a favorable adoption decision towards the ASI tool's use. This steep incline of the S-curve made by early adopters was driven by the clinic's interpersonal communication networks (Rogers, 2003; Tarde & Clark, 1969). Keeping the QI project compatible with MHC's needs of increasing the staff's ASI knowledge and intention to use gradually eliminated the skeptical late-majority as more early-majority adapted to the changes (Rogers, 1983).

Literature Synthesis

Evidence Search

Literature searches were done across two trusted and respected digital databases: PubMed and CINAHL. The key terms "ASI," "ASI screening," "addiction severity index," "substance abuse screening," and "opioid use disorder screening" were used. However, simply "addiction

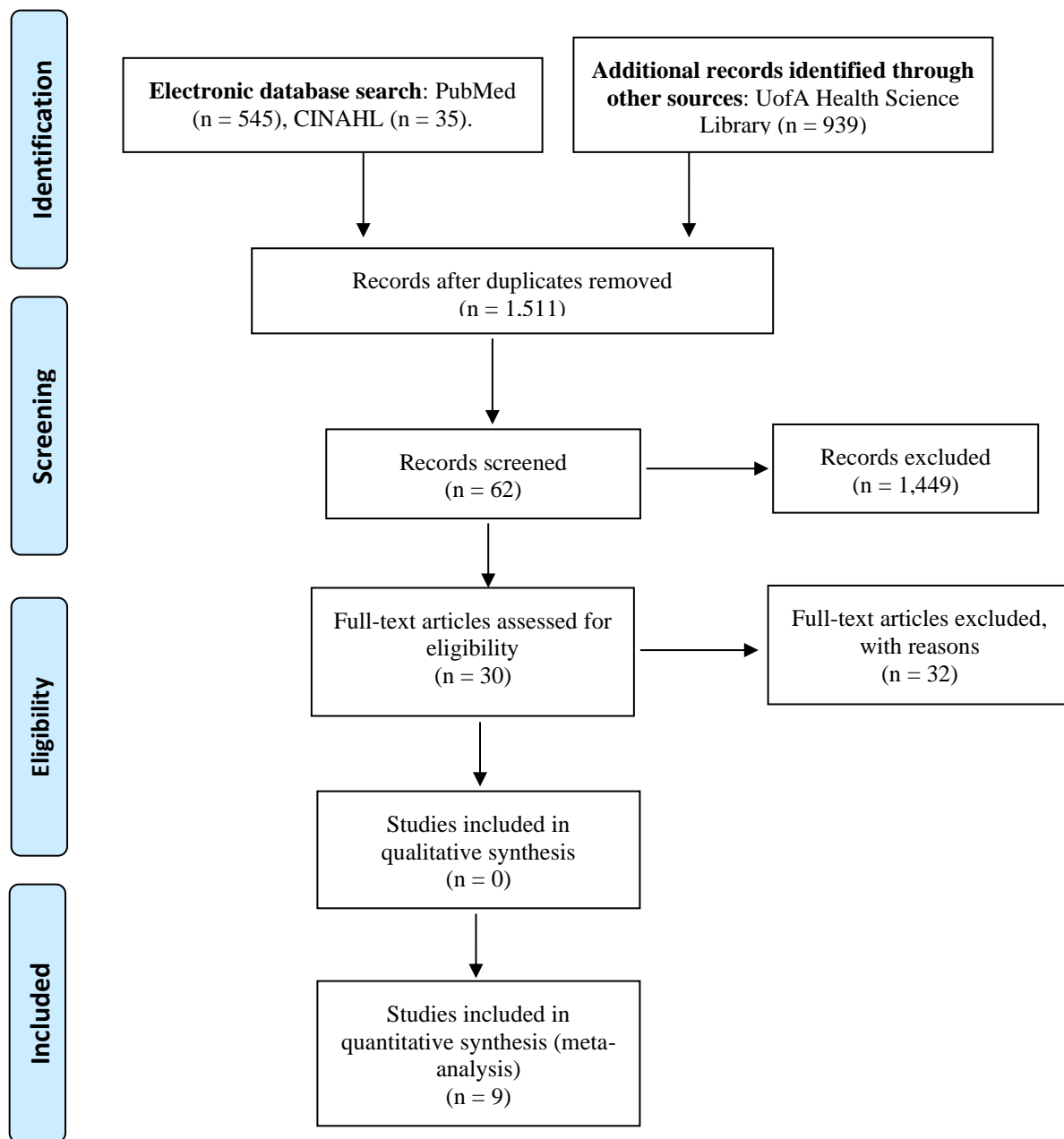
severity index,” proved most effective for each database. The search criteria were limited to the English language before being further narrowed down on their respective platforms. The criteria for reviewing articles were abstracts that included using the ASI as a measuring tool and treating a SUD population. Selected literature satisfied both requirements, while excluded ones used different substance assessment tools.

Using PubMed’s search bar to enter “addiction severity index,” 2371 articles resulted from the keywords. After adding the parameters of “5-year publication date,” “full text,” and “humans,” findings decreased to 545. In the advanced search “builder” tool, the key term “screening” was also added using the “AND” search bar. However, this made searching less accurate and was later removed. Using the “switch to our new best match sort order,” filtering became more organized, moving the most pertinent articles to the top and less pertinent to the bottom of the 545 results. Three duplicates were excluded, and four studies were chosen from ten reviewed articles. The rationale behind their selection required the researchers to use the ASI in a way that can benefit its adoption in real-world practice. Literature that only used the tool to reinforce their study results but necessarily the ASI’s clinical application, such as the excluded articles, was not beneficial for this QI project’s purpose.

Using CINAHL, key terms were entered into the search engines “boolean/phrase” to retrieve 476 results using “addiction severity index.” The search was further refined by applying the “AND” search command to add “tool.” Next, “full text” and “2015-2020 publication date” was added to get a more accurate 35 results. From there, eight articles were reviewed, no duplicates were present, and one suited the required needs. Like the search results in PubMed, CINAHL’s ASI articles predominantly included publications that did not center their study

around the involvement of the tool. The supportive role that the ASI instrument was given in these articles failed to contribute to its understanding or application for substance abuse treatment. Only one succeeded in this requirement for the goal of future adoption.

To further broaden the search, the phrase “addiction severity index” was entered into the general search bar of the University of Arizona (UofA) Health Science Library, which led to 53,240 results from multiple databases. The list was refined using the following filters: “peer-reviewed/scholarly resources,” “full text online,” “2015-2020 publication date,” “articles,” “humans,” and “is (exact)” under the advanced search menu were added to narrow results down to a more manageable 939 studies. In total, five duplicates were excluded, 12 articles were reviewed, and four were chosen. Most of these reviewed articles used the ASI alongside other established addiction assessment tools to support their studies’ purposes but without much emphasis on the ASI to achieve a meaningful outcome. The selected four studies, however, increased the ASI’s understanding and contributed to this QI project’s realization. Ultimately, nine articles were selected for the literature review. See Figure 4 (below) for the article’s search, selection, and elimination process. See Appendix G for the selected literature’s detailed description and breakdown.

Figure 4*PRISMA Flow Diagram of Literature Review*

Comprehensive Appraisal of Evidence

A synthesis of the literature on the ASI tool shows it to be an excellent instrument for complimenting SUD treatment. Several studies have recognized and reported on the ASI's ability to generate strong evidence of predictive validity, concurrent validity, reliability, and discriminative utility across gender, age, race, and main substances of abuse (Butler et al., 2017; Mohamed et al., 2017; Olsson, Ojehagen, Bradvik, & Hakansson, 2015; Padyab, 2018; Shah et al., 2015; Thylstrup et al., 2018; Drymalski & Nunley, 2016). This accuracy was made possible through the ASI's comprehensive screening process that is accepted to be an excellent initial filter in integrated care systems that treat populations with both substance use and mental health needs (Drymalski & Nunley, 2016). Assessing patients thoroughly during this initial encounter before starting care is important to ensure that their unique needs do not go unmet. Doing so simultaneously increases treatment and services management by correctly distributing resources to patients with the greatest needs (Drymalski & Nunley, 2016). The following research explores the different utilities of the ASI tool to succeed this by addressing the instrument's treatment management, predictability, validity and reliability, guided care, and information collection versus time.

Treatment Management

Mid-treatment, strategic changes were made possible through the ASI's streamlined process (Cushman et al., 2016; Public Health Management Corporation [PHMC] Research & Evaluation Group, n.d.). Providers that applied this screening measure had the advantage of a standardized tool that can help them make competent SUD management treatment decisions (Appendix E). Baseline ASI CSs are between 0.00-1.00, with 1.00 representing the highest

problem severity (Shah et al., 2015; Ljungvall et al., 2020). Previous research has found success categorizing substance abuse patients by three ranges, subthreshold, mild/moderate, and severe at scores ≤ 0.04 , $0.04 - 0.24$, and > 0.24 respectfully (Shah et al., 2015). Based on the patient's determined category, a necessary treatment that matches their addiction severity can be applied, assessed, and replied yet again to measure their degree of progress captured in the CS change (Padyab et al. 2018). For example, statistically significant evidence has revealed the predictive values of the ASI's CS to distinguish SUD sufferers that can benefit from additional psychiatric interventions (Drymalski & Nunley, 2016). Furthermore, patients measured up to six months post-detox by the ASI have reduced substance use and significant treatment-seeking behaviors (Casares-López et al., 2011). Advanced practice providers can capitalize on these opportunities to do just that. Based on the explained severity categories, the multi-disciplinary team can track patient's changing scores at admission, 3, 6, and 9-month periods into their treatment before administering additional interventions as needed (Cushman et al., 2016; Drymalski & Nunley, 2016). See Table 1 below for exemplar of the ASI treatment plan's repeated adjustment in response to CS changes.

Table 1

ASI Guided Treatment Plan

ASI Measure	Initial	Month 3	Month 6	Month 9
Composite Score	Baseline CS	Increased CS	Unchanged CS	Decreased CS
Change to Care	Start Treatment	Intensify Treatment	Maintain Treatment	Decrease Treatment

This adaptive living care plan that grows along with the patient's improvement or regression is an optimal approach to maximize the provider's SUD treatment management by

leveraging the ASI's arguably most valuable trait of prediction (Drymalski & Nunley, 2016; Alyssa Bell, personal communication, February 28, 2020).

Predictability

Numerous correlations have been made between substance use and the patient's mental/physical deterioration due to the ASI's increased sensitivity to identify changes even during active treatment to foresee outcomes (Padyab, 2018; Drymalski & Nunley, 2016; Mohamed et al., 2017; Olsson et al., 2015; Thylstrup et al., 2018; Shah et al., 2015). Evidence revealed that a significant predictor of just a 0.01 decrease in CSs increased participant's drug court graduation rates by 0.011 times (Shah et al., 2015). Even the CSs post-discharge predictability for patients reentering psychiatric services is significant ($p < 0.001$) and may help reduce future admissions (Thylstrup et al., 2018). However, the strength of the ASI's predictability in different settings, such as drug courts, can benefit from cross-validation comparisons to determine the predictive model's accuracy (Shah et al., 2015). Additionally, the ASI's cutoff CSs which divide participants into different severity groups (subthreshold [≤ 0.04], mild to moderate [$0.04 - 0.24$], and severe [> 0.24]) has not been well researched for sensitivity and specificity (Shah et al., 2015).

Validity and Reliability

Validity is a tool's ability to measure what it is meant to and reliability is a tool's ability to have consistent outcomes when repeated; the ASI is trusted to succeed both (Butler et al., 2017; Thylstrup et al., 2018; Drymalski & Nunley, 2016; Mohamed et al., 2017). This praise is consistent with the ASI's ability to correctly connect substance use with family/relationship problems ($r=0.282$, $p<0.001$), health/medical problems ($r=0.179$, $p<0.01$), psychiatric problems

($r=0.207$, $p<0.01$), and legal problems ($r=0.215$, $p<0.01$) (Mohamed et al., 2017). Even computer adaptive testing (CAT) of the ASI tool into electronic medical records (EMR) determined it to be reliable, sensitive to change, and valid (Butler et al., 2017). Additionally, elements of the ASI's multifaceted assessment are strong compared with established psychiatric distress and depression measures (Drymalski & Nunley, 2016). A promising Cronbach's alpha (0.581-0.873) that measures internal consistency further supports this claim as well as positive test-retest reliability (0.251-0.946), and inter-rater external reliability (0.283-0.7) (Mohamed et al., 2017).

The self-reported features of the ASI have been scrutinized for complicating psychiatric problem interpretation, especially in the severely mentally ill (SMI) (Drymalski & Nunley, 2016; Olsson et al., 2015). When assessed by the ASI, these SMI patients tend to have lower test-retest reliability and internal consistency results (Drymalski & Nunley, 2016; Olsson et al., 2015). Causes are the ASI's lack of sensitivity to compensate for the SMI patient's cognitive impairment and document their unique functional problems accurately (Drymalski & Nunley, 2016). Also, due to the ASI's high sensitivity in non-SMI patients, specificity is naturally lowered and can result in several false positives (Drymalski & Nunley, 2016).

Guided Care

Literature consensus on the ASI's ability to identify severe problems based on elevated CSs, indicating the need for more intense treatment is positive (Drymalski & Nunley, 2016; Ogai et al., 2015; Olsson et al., 2015; Shah et al., 2015; Thylstrup et al., 2018). In treatment settings, ASI is the gold standard measure for SUD client-treatment matching, program evaluation, assessment and research, and treatment plan development (Butler et al., 2017). Based on MAT's definition (FDA medications, therapy, & monitoring), this increased treatment can come in the

form of additional psychotherapy, additional pharmacological interventions, rehabilitation planning, diagnostic labs, and placements into more appropriate levels of care which the ASI can detect the need for (Ljungvall et al., 2020; Mohamed et al., 2017; Olsson et al., 2015; Thylstrup et al., 2018). Though one study opposes the merit of the ASI's CS's ability to conduct such a transfer between care alone, it recognizes the ASI as an appropriate screening tool to initiate the process (Drymalski & Nunley, 2016).

The ASI's highly qualified operator demands can be considered a weakness of the instrument (Butler et al., 2017; Padyab et al., 2018). In Sweden, certification acquired through a regulated training program is required before conducting a single ASI interview (Padyab et al., 2018). This strict constraint can cut down on the readily available use of the ASI tool in practice. Furthermore, the interviewer's level of experience can affect the results enough that the relevance, psychometric properties, and quality can be called into question when performed by insufficiently trained staff (Butler et al., 2017).

Information Collection versus Time

Various language and platform adaptations of the ASI have attested to the tool's assessment strengths that cover the patient's last 30 days across several domains (Butler et al., 2017; Drymalski & Nunley, 2016; Padyab et al., 2018; Shah et al., 2015; Thylstrup et al., 2018). The substance use domain, in particular, determines the patient's abuse severity and associated functioning such as consequences of use, desire to seek help, the effects of psychiatric symptoms on their wellbeing, and the number of days said symptoms bothered them in the past 30 days (Padyab et al., 2018). Unfortunately, this dense information collection comes at the expense of clinical productivity and can prove to be an expensive screening measure (Butler et al., 2017).

Traditional assessments of the ASI can range 45-60 minutes (Butler et al., 2017; Ljungvall et al., 2020; Mohamed et al., 2017; Ogai et al., 2015) per patient administration plus an additional 10-20 minutes after to calculate the composite scores (Butler et al., 2017; Ljungvall et al., 2020). This time obligation becomes even more complicated in investment versus benefit when staff resource availability is considered, especially in facilities suffering from workforce shortages (Ljungvall et al., 2020). Fortunately, modern EMRs have significantly reduced this time commitment by cutting the ASI's administration duration by 50-80% (Butler et al., 2017). Additionally, even the tool's limitation that requires it to be interviewer administrated has been tested against self-reported versions to discover comparable reliability and internal consistency between the two assessment forms (Ljungvall et al., 2020). Literature also suggests that the information collected from self-reported questionnaires is more reliable on socially undesirable actions such as drug use, which aligns with this tool's population of interest (Ljungvall et al., 2020). These discoveries are crucial because not only does a self-reported ASI assessment have the potential to improve the quality of collected information, but lessens the staff's clinical workhour demands as well if adequately adapted (Butler et al., 2017; Ljungvall et al., 2020).

The ASI has quality research support and promising application potential in clinical practice if appropriately adapted. The tool's addiction management capabilities that are substantiated by its favorable validity and reliability can be seen in its predictability that assists in care allocation (Drymalski & Nunley, 2016; Ljungvall et al., 2020; Thylstrup et al., 2018; Shah et al., 2015). This guided care that pinpoints client's needs down to the medical intervention such as pharmacological treatments or social worker services can be a time-consuming process from beginning to end (Butler et al., 2017; Ljungvall et al., 2020; Mohamed

et al., 2017; Ogai et al., 2015; Thylstrup et al., 2018). Fortunately, modern innovations such as EHR and self-administered forms have expedited this assessment to implementation curve, thereby lowering both care costs and work hour demands while maintaining impressive treatment outcomes (Butler et al., 2017; Ljungvall et al., 2020).

Strengths of Evidence

All studies of interest proved to be a positive contribution to further ASI understanding and available scholarly writing expected of professional literature research. Most authors made it a point to declare no conflict of interest such as financial support that can influence reported claims (Drymalski et al., 2016; Mohamed et al., 2017; Ogai et al., 2015; Olsson et al., 2015; Shah et al., 2015). Any financial backing that researchers received came from neutral, non-commercial entities such as social affairs government programs and grant organizations that pose less risk for inspiring bias (Butler et al., 2017; Ljungvall et al., 2020; Padyab et al., 2018; Thylstrup et al., 2018). The selected studies were consistent in their population selection of SUD patients, which corresponds with this QI project. The literature's level of evidence ranged between observational to experimental studies, which is satisfactory considering the scarce research available on the tool within the last five years at the time of this writing. Only approximately 53 articles related to the ASI were published between 1980 to 1997 (PHMC Research & Evaluation Group, n.d.). Much fewer publications can be found in the last five years to the best of this writer's knowledge. Fortunately, each of the selected studies falls into this 2015 to 2020 timespan to provide the most up-to-date evidence.

Four articles also have impressive sample sizes that range between 4,081-19,320 participants, which increases the likelihood of sufficient research power and external validity

(Butler et al., 2017; Drymalski & Nunley, 2016; Dwivedi et al., 2017; Olsson et al., 2015; Polit & Beck, 2017; Thylstrup et al., 2018). Adequate power is essential because it determines the number of subjects required in each group modality needed to detect any significant results (alpha 0.05) present in the observations (UA College of Nursing, 2017). Satisfying this requirement as the chosen articles likely have will ultimately increase their study results reliability (Dwivedi et al., 2017).

Weaknesses of Evidence

Several significant weaknesses are consistent throughout the chosen articles. As previously mentioned, the ASI's limited research within the last five years caused some higher levels of evidence such as systematic reviews to be excluded from the synthesis compiling (Butler et al., 2017; Drymalski & Nunley, 2016; Ljungvall et al., 2020; Mohamed et al., 2017; Ogai et al., 2015; Olsson et al., 2015; Padyab et al., 2018; Shah et al., 2015; Thylstrup et al., 2018). Additionally, because baseline ASI information collection requires patients to be assessed before their hospital admission, the history of their addiction or even the presence of a SUD diagnosis is unclear at that time due to not being clinically established yet (Ljungvall et al., 2020). Researchers limited the risk of this by gathering patients seeking or referred to SUD treatment to ultimately retain a 72% population with addiction treatment history (Ljungvall et al., 2020). However, the remaining 28%, in this study's case, can be detrimental to the outcome by skewing the results due to the presence of an inconsistent population sample (Polit & Beck, 2017).

Gaps and Limitations

Considering several ASI studies were done in the retrospective cohort design, significant literature gaps exist in the present use of the tool (Drymalski & Nunley, 2016; Padyab et al., 2018; Thylstrup et al., 2018). Evidence is clear on the ASIs predictive abilities and strengths in managing patient care as evidenced by significant results for future treatment needs (Drymalski & Nunley, 2016; Olsson et al., 2015; Padyab et al., 2018; Thylstrup et al., 2018). However, few studies have capitalized on the ASI's full potential beyond risk factor identification alone (Mohamed et al., 2017; Ogai et al., 2015; Shah et al., 2015). The long-term predictability of the ASI has been tracked up to an impressive 12-months (Drymalski & Nunley, 2016). Still, it is uncertain if those participants received care beyond the study based upon their ASI results. If so, researchers failed to report how those response interventions impacted the patient's addiction recovery and treatment.

Much like weaknesses and gaps, limitations were also evident in the literature. Concerning sample size, three studies fell below 300 participants (Mohamed et al., 2017; Padyab et al., 2018; Shah et al., 2015), and two did not exceed 120 clients (Ljungvall et al., 2020; Ogai et al., 2015). These small numbers can be problematic as insufficient sample sizes risk not supporting the research question (Fowler & Lapp, 2019; Polit & Beck, 2017). Fortunately, three articles countered these small patient pools by using nonparametric tests such as chi-square analysis (Shah et al., 2015) and Wilcoxon rank-sum test (Ljungvall et al., 2020; Padyab et al., 2018). Unlike parametric testing (t-test), nonparametric does not assume that a normal underlying population distribution exists (APA, 2020b; APA, 2020d; APA, 2020e). This trait allows nonparametric to function even in low sample sizes ($x < 30$), which was highly

appropriate for these articles (Dwivedi et al., 2017). Additionally, two article's participant data came from a single clinic facility (Ljungvall et al., 2020; Olsson et al., 2015). Limiting data collection in this way is counterintuitive to future intervention transferability as it further narrows the patient spectrum and loses generalization (Polit & Beck, 2017; University of Connecticut, n.d.). This external validity loss makes the studied intervention less likely to impact different age groups, races, and social populations equally (Polit & Beck, 2017).

METHODS

Project Design

This project is a QI initiative that applied a one-group, asynchronous, pretest-posttest quantitative design. The goal was to increase the MHC provider and staff knowledge and intent to use the ASI tool (Appendix H) using the ASI guided treatment plan (Appendix E) to manage OUD patient's care. A PowerPoint presentation was the education delivery method. The lecture was based on the creator's training manual recommendations of proper ASI administration and clinical practice application of the tool (PHMC Research & Evaluation Group, 2020).

Participants were tested before and after the e-lecture to capture any differences in their ASI knowledge and intent to use the tool in OUD patient care management.

Model for Implementation

Progress is defined as the movement towards desired goals (Merriam-Webster, n.d.). The most crucial variable in this process is the time it takes to clear that distance. The model for improvement (MFI) emphasizes this variable to accelerate improvements in live-work environments (Institute for Health Improvement [IHI], 2020c). The MFI is divided into two separate components to succeed in this (IHI, 2020b). The first is three essential questions made

to address different study components: aim setting, measurement establishing, and change selection (IHI, 2020c). Next, these questions are followed by a four-step action-oriented portion of the model called the plan-do-study-act (PDSA) cycle (IHI, 2020c). As the four labels suggest, PDSA is adapted from the scientific method to plan a hypothesis, attempt the theory, observe the hypothesis results, and improve the prediction repeatedly by trial and error (IHI, 2020c). For a graphic demonstration of the MFI's three questions and PDSA as they pertain to this QI project, see Appendix I.

Three Questions

Aim. According to the IHI (2020e), improvements will fail if organizations lack a clear and intentional objective. This QI project provided that aim by increasing MHC's interdisciplinary team's overall understanding and potential use of the ASI tool to manage OUD patient's care. Acquiring mutual aim buy-in is essential to get the required amount of resources allocated to the intervention (IHI, 2020e). To better ensure this, a well-defined goal is necessary by making it both time-specific and quantifiable (IHI, 2020e). Methods to succeed this included a 20-minute asynchronous educational presentation and training for participating multi-disciplinary team members. The measurable objective was to increase the staff's intention to use the tool by 10%.

Measure. Appropriate measurement methods are required to determine the presence or absence of improvement in a change initiative (IHI, 2020a). A valid measurement for learning that suited this project's needs of sequential use before and after the intervention was the online pretest-posttest design (American Psychological Association [APA], 2020c; IHI, 2020a). This design included both knowledge-based and Likert questionnaires. The pretest/posttest questions

determined the staff's ASI knowledge change, and the pre-Likert-post-Likert questions measured the staff's intent to use the change.

Change. Practice changes can lead to several desired outcomes, such as reduced waste, improved time management, and more, but the goal of this project's change was service focused (IHI, 2020d). According to IHI (2020d), improving company services and products is essential. The 20-minute presentation educated staff on the different ASI assessment domains and their use to improve patient information collection and patient treatment plans (service focused). The participant's changing knowledge and attitude towards the tool determined how effective the intervention was. After answering the three questions, PDSA cycling began.

PDSA

Plan. This project's goal was to increase the interdisciplinary team's knowledge and intent to use the ASI tool to manage opiate patient's treatment plans. Providers and staff were invited to participate in a 20-minute e-lecture on the ASI by email and WOM advertising. A Microsoft Office PowerPoint delivered this education at the MHC main site by asynchronous lecture. This training was delivered to voluntary participants that provide direct patient care to ages 18 and older. The project did not require any financial budget.

Do. Upon starting the e-lecture, three minutes were used to introduce the speaker and provide instructions. Next, the provider and staff's baseline ASI knowledge was assessed using a 17-item pre-test. This test focused on the participant's understanding of the ASI tools: purpose, proper use, and value to standardizing their facilities OUD patient treatment plans. Participant's baseline intention to use the instrument was also assessed with pre-Likert questions that are capable of direct attitude measurements (APA, 2020a). Ten minutes were given to complete the

17-questions. After submitting the online survey, education commenced for 20-minutes by PowerPoint e-lecture. Upon completion, a 19-item post-test was done to evaluate the faculty's changed ASI knowledge and intent to use. Ten minutes were given to complete these 19-questions. The entire training took approximately 45-minutes.

Study. After receiving the questionnaires, time was set aside for data analysis (IHI, 2020f). Studying how the education affected participant's ASI knowledge and intention to use the change gave insight into the staff's ASI perception. The questionnaires were analyzed by comparing the percentage of incorrect versus correct answers between the pre- and post-tests. This descriptive analysis was carried out on the Microsoft Office Excel (Excel) software. Results are displayed with appropriate graphics based upon the information's variable type: bar graphs for ordinal and categorical data.

Act. Intervention modification occurred during the act phase after learning from the PDSA cycle test (IHI, 2020f). Any insight discovered at this time is included within the discussion of this paper as advice for similar future studies to learn from and better avoid.

Setting

The setting that this QI project was implemented at is MHC, located in the town of Marana in Pima County, Arizona. Originating from the Hohokam Indians that settled along the Santa Cruz River (550-850), the southern pacific railroad map first showed "Marana" in 1890 (Marana AZ, 2020b). The MHC opened 67 years later as the location's oldest healthcare services (Marana AZ, 2020b; MHC, 2020a). Their first customers were poor migratory farmworkers who benefited from MHC's sliding fee scale that captured the medically underserved for low-income

healthcare services (MHC, 2020a). The MHC treats 50,000 patients today across 16-healthcare centers in Marana and Tucson (MHC, 2020a).

However, the growth still proved insufficient to prevent Marana from being classified as a critical health manpower shortage in 1972 (MHC, 2020a). This shortage still burdens the community seen with a 471:1 population-to-provider ratio (health planning region: 382:1) (ADHS, 2018b). The town also has zero hospital beds per 1000 residents and zero specialty beds, skilled nursing facilities, and nursing beds (ADHS, 2018b). Possible consequences of this resource shortage can contribute to the resident's 58.2% premature mortality rate (county: 51.5%) (ADHS, 2018b).

Services at MHC span dental, counseling, family practice, internal medicine, outreach, pediatrics, pharmacy, urgent care, WIC, and women's health (MHC, 2020b). Additionally, only one substance addiction specialist is employed (D. McKenzie, MD, personal communication, March 4, 2020). Residents must go to the closest emergency department, Northwest Emergency Center, 9.4 miles away for additional services (Google Maps, 2020). However, the town's uninsured under age 65 (5.6%) and persons in poverty (6.5%) are far less than Arizona's states 12.7% and 14.0%, respectfully (United States Census Bureau [USCB], 2019). The town is even recognized as being "the fastest-growing community in Southern Arizona" to show the location has made many strides from its humble beginnings (Marana AZ, 2020a). Today, the town's census reaches 47,007 residents with the following sex, age, and race graphic breakdown: (USCB, 2019).

Figure 5

Marana, AZ Sex & Age

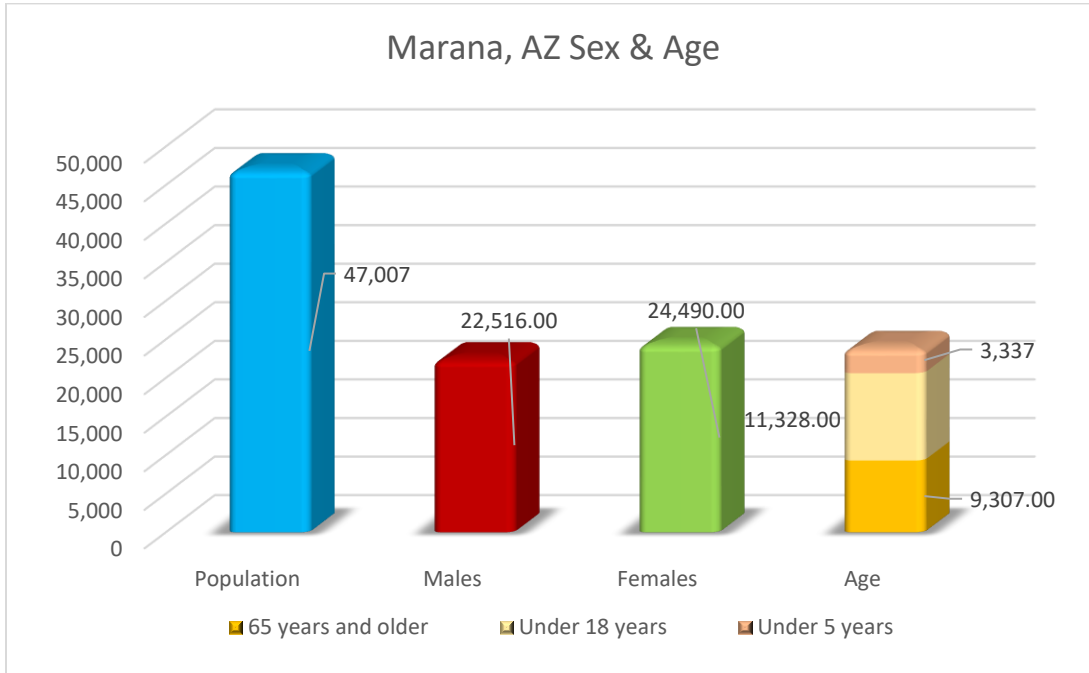
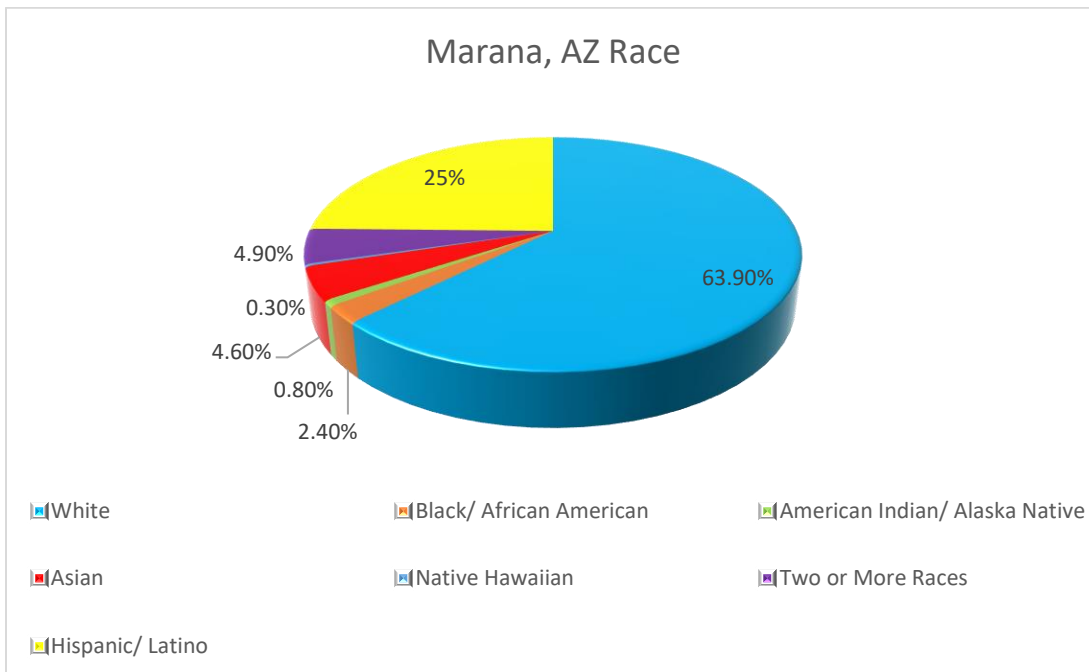


Figure 6

Marana, AZ Race



Site Stakeholders

Implementing a successful process improvement is contingent upon gathering the correct people, team size, and composition to match the task at hand (IHI, 2020b). This composition breakdown should consist of different professionals that are familiar with the many process parts involved in the work chain (IHI, 2020b). Effective teams should recruit members that satisfy three different roles: technical skills, day-to-day, and system leadership (IHI, 2020b). The technical expert is familiar with all steps of the care process and helped simplify the ASI's tool use at MHC by providing technical support, information collection guidance, and data interpretation (IHI, 2020b). This role was fulfilled by both a physician who is a substance abuse specialist and the supervisor of the therapy department, who is an expert using the ASI instrument. Errors were more likely to occur without their assistance. Day-to-day leadership was responsible for the ASI's optimal use by ensuring that staff are aware of the tool and know where to get the information if not (IHI, 2020b). Failure to do this could have resulted in an incomplete QI project from poor management. One of the therapy supervisor's recovery coaches (RC), that keeps track of all SUD patients that can potentially be screened with the ASI tool was well suited for this role. Lastly, system leaders were the peak authority involved in the ASI's implementation at MHC (IHI, 2020b). This individual resolved any clinical complications or team issues that jeopardized the project's realization (IHI, 2020b). This task was done by the chief of clinical behavioral health (CCBH) at MHC that was supportive of the ASI's success and extended his assistance. Each expert was capable of satisfying their essential roles and worked alongside the remaining team, including an APN and the frontline registered nurses, therapists, medical assistants, and desk secretaries. Traits of high functioning teams include coordination,

positive communication patterns, participation, low conflict, cooperation, and high collaboration (Riggall & Smith, 2015). All of which were considered in this team's formation.

Planning the Intervention

Introductions with MHC's key stakeholders occurred on January 22, 2020 during the needs assessment. Several planning meetings (Appendix F) happened with the physician in his office from this date onward. The goal of the meetings were to determine how to best bridge the information collected from the ASI tool to their outpatient services. The PHMC research and evaluation group that created the ASI was contacted for their insight to better achieve this. A return email was received from the product manager, Alyssa Bell, on February 28, 2020 (Appendix J). She advised using the ASI as a device to adjust patient's treatment plans as needed based on their composite score changes between interviews (Alyssa Bell, personal communication, February 28, 2020). This recommendation validated the project's current plan, which was later supported by the CCBH and therapy supervisor on March 26, 2020. Considering MHC staff's lack of ASI knowledge and plan to maximize the tool's use at the facility, this plan perfectly suited the education-focused QI project.

Invitations to this e-training session were delivered by email with the CCBH's executive administrative assistants (EAA) aid two weeks before the training closed. Emails were initially meant to be sent from this writer's personal MHC outlook login, which permission was granted. However, to exclude 'operational staff' that work outside the CCBH's department, the EAA's aid was needed to filter the invitation pool. Flyer details included in the emails contained the e-lectures open to close dates. The presentation was open for two weeks, and the project director's (PD) contact email and phone number were available for questions.

The educational intervention was emailed to the MHC staff in Marana, Arizona, on August 28, 2020. The recruitment email and participation process were simplified to include the least required steps to retain subjects' attention. Email details explained the project's purpose and time commitment and had one link to Qualtrics that housed the surveys and PowerPoint education if they chose to participate. Once at Qualtrics, participants were welcomed and given instructions on the second PowerPoint slide, "Introductions," and prompted to follow the next arrow to the third slide called "Pre-Questionnaire." After being debriefed on per-survey expectations, participants continued to the disclosure form for signing. Here, subjects reviewed and consented by selecting, "Yes, I agree to participate in the project," before any pre-survey questions appeared. This was a 5-minute process up to that point.

Participants had 10-minutes to complete their first survey after consenting before being routed to the PowerPoint e-training. The intervention was a 20-minute lecture on the ASI to standardize opiate patient treatment plans. Emphasis was placed on the ASI's seven life domains impacted by drug abuse and how healthcare professionals can use them to treat patient's problem areas. Identifying these areas can dictate how their treatment plans are augmented in response (McLellan et al., 2006). After the 20-minute e-lecture, which was timed to respect the participant's schedules, a "post-questionnaire" slide on Qualtrics revealed post-survey and consent expectations. Participants were given 10-minutes to complete this post-survey, which was identical to the first, but with two additional questions. Four demographic items were also included in both pre-/post-tests.

The 20-minute e-lecture was based on the PHMC research and evaluation (PHMC, 2020) training manual recommendations that cover the instrument's administration, composite score

calculation, and proper clinical use. This information was meant to provide a more accurate and hopefully positive perspective of the ASI tool to manage opiate patients' treatment plans, which MHC staff lacked (Emani et al., 2018). Additionally, the unclear use of the ASI tool at MHC to succeed standardized opiate treatment was addressed with the MHC ASI guided treatment plan. This table, as well as the mentioned pre-/post-questionnaires, were reviewed by the therapy supervisor, who is a document specialist. The table was customized to be a simplified instrument that adapts the ASI's components to suit MHC's current drug treatment services. Using familiar services to fill the table's content prevented staff from having to learn additional skills that can discourage adoption (Emani et al., 2018). The total time commitment was 45-minutes.

Participants and Recruitment

Using MHC's extensive email communication network and WOM, willing participants were recruited to participate in an online, 20-minute ASI education two weeks before the training closed. Emailed invitations and flyers included the training's release date and instructions on accessing the content in bold, colorful lettering for visual purposes. The PD's phone number and personal University of Arizona college email were also included for further assistance. Because the training was multi-disciplinary, eligible participants included directors, medical doctors, nurse practitioners, registered nurses, therapists, recovery coaches, nurse assistants, and secretaries. An interdisciplinary model was chosen due to tailored therapy programs with varied care approaches being considered crucial in drug addict's treatment success (NIDA, 2019d). These approaches can include pharmacological interventions, behavioral counseling, withdrawal symptom treatment with medical devices, recovery support systems, and relapse prevention with follow-up services (NIDA, 2019d). Participant inclusion criteria included a) any multi-

disciplinary professional that provides direct care to OUD patients age 18 and older, b) provide voluntary consent for the 20-minute education session, c) the MHC main employee should be 18 years old and up, d) have a primary English language and f) have access to a computer with an internet connection. Exclusion criteria included a) MHC main staff that do not provide direct patient care to OUD patients age 18 and older, b) those that refuse voluntary consent, c) lack of access to a computer with an internet connection, and d) MHC patients. In total, this project had a sample size of six participants.

Consent and Ethical Considerations

Two primary considerations are required when addressing ethical standards in a project: 1) approval by an institutional review board (IRB) (Appendix A) and 2) the use of disclosure forms (Appendix B) (Connelly, 2014). First, the ethics of the project were validated by receiving IRB approval through the University of Arizona's College of Nursing (Appendix A). Executing this first step was vital due to IRB's universal role in protecting the rights of human and even animal subjects during studies (Connelly, 2014). The second step of providing disclosure was also essential to ensure that the participants understood the voluntary nature and risks (Connelly, 2014) (Appendix B). The following three ethical principles of respect for person, beneficence, and justice were incorporated throughout the execution of this project to ensure moral practices were upheld.

Respect for Person

First, respect for persons is understanding that humans are autonomous agents and should be treated as such (HHS, 1979). The MHC provider and staff's decision-making skills were respected by providing a clear, honest, and coercion free disclosure form (Connelly, 2014).

Despite MHC's CCBH's interest in the project, the staff was informed that their participation in the training session was a choice, not a requirement (Connelly, 2014). Anyone that declined attendance did not receive personal or professional backlash because of their decision.

Additionally, any incentives were kept to a minimum to avoid excessive enticement that can act as subtle coercion practices (Polit & Beck, 2017).

Beneficence

Next, beneficence is bringing no harm to subjects by minimizing damage and maximizing benefits (HHS, 1979). This QI project's chosen intervention was an education-based approach that posed no expected safety concerns to staff that decided to participate. Attendance during the training was designed to require minimal staff effort while learning and little to no mental/physical burden during pre-/post-intervention data collection (Connelly, 2014). Any personal information retrieved at the time was done with the utmost care as the intrusion risks on participants' psyche should never be underestimated (Polit & Beck, 2017).

Justice

Lastly, justice is understanding and upholding the subject's inherent rights to fair treatment and confidentiality (Polit & Beck, 2017). This discretion was maintained during and after the project's completion by taking appropriate privacy measures and precautions. Electronic surveys excluded an identity section, such as a name line, to discourage participants from disclosing themselves. Information retrieved from these surveys were imported into an encrypted Excel document by the PD only. Excel information was further de-identified using placeholder numbers (e.g., P-001 through P-006) as the participant's identifiers. The computer containing this information was also password-protected and further secured in a locked office. Only the PD

had clearance and knowledge of the procedure required to access this information before it was deleted after the data was analyzed. Any future needs of the data after the project's completion was archived in the University of Arizona's College of Nursing cloud box service behind password login walls.

Data Collection

Quantitative data collection for this QI project was done using a one-group, asynchronous, pretest-posttest design. This repeated measure design was a proficient approach because it can capture the change significance associated with an intervention's efficacy (Polit & Beck, 2017). Questions that addressed participants' knowledge and attitude towards using the ASI were adapted from the research and evaluation group's ASI Manual and Question by Question Guide (ASI Manual) and the brief substance abuse attitude survey (SAAS) respectfully.

ASI Manual

The fifth edition of the ASI manual is a 103-page document that details the history, purpose, evolution, functions, and shortcoming of the drug screening tool (PHMC Research & Evaluation Group, 1990). This manual is a trustworthy source written by the Veterans Administration Center at The University of Pennsylvania (UPenn), which campus for higher learning dates back to 1740 (Upenn, n.d.). A 6-item multiple-choice questionnaire with selectable answers "A" through "D" was adapted from this content to focus primarily on the tool's functionality and clinical application. Prominent proponents such as what the ASI tool measures, proper administration, understanding both the patient and interviewer's roles, and troubleshooting circumstances that can disrupt information collection were emphasized.

Questions were delivered in the explained pre-/post-test design to measure the participant's baseline and post-intervention ASI knowledge.

Brief Substance Abuse Attitude Survey

The SAAS was created by Dr. Benjamin Kissin (1976) as a superior method to previous questionnaires to address test-takers' attitudes towards substance dependence treatment better (Chappel et al., 1985). The test covers various substances, etiologic beliefs, drug use patterns, and treatment methods (Chappel et al., 1985). Previous literature has found the SAAS instrument to have capable validity and reliability in measuring attitude changes predominantly in medical students (Chappel et al., 1985; Chappel & Veach, 1987). However, the tool has also proven effective in undergraduates with business, criminal justice, social health, education, and psychology backgrounds (Jenkins et al., 1990). Undergoing several iterations by consulting 42 career teachers and 201 clinicians specializing in drug misuse treatment, the 153-item Likert questionnaire was condensed to 50 questions (Chappel et al., 1985). A shortened form of this SAAS called the Brief SAAS that consists of 25 "Strongly Disagree" to "Strongly Agree" questions were modified to create this QI project's 9-item Likert survey (Yale School of Medicine, 2020). These adapted items delivered by a 5-point, pre-/post-Likert quantitative design were meant to measure healthcare professional's attitudes towards opiate treatment using the ASI guided treatment plan.

Data Inclusion and Exclusion

Despite the ASI manual having ample details on the instrument, unnecessary knowledge not required for its clinical use was excluded from the pre-/post-test questioning. This exclusion included information such as: a) history of the ASI, b) details concerning populations not seen by

the MHC substance addiction specialist such as adolescents, and c) traditional paper form test information due to MHC owning the ASI CAT version. Among the 25 available brief SAAS Likert questions, exclusion criteria included: a) questions concerning drugs outside of the opiate class, b) matters relating to disorders outside of OUDs, c) questions which measured attitude on substance abuse alone rather than on care approaches effect in substance abuse treatment, d) questions that measure attitudes directed towards the healthcare staff rather than the patient, and e) questions that focus on the location of treatment. These exclusion rules were corrected by augmenting items to meet inclusion needs. For example, if a question’s drug/disorder of interest said, “drug abuse” or “alcoholism,” it was replaced with “opiate” (Yale School of Medicine, 2020). Additionally, when questions used different interventions such as “urine drug screening” or “group therapy,” the phrase was replaced with the “ASI guided treatment plan” (Yale School of Medicine, 2020). These changes ensured that the provider and staff measured attitudes would stay focused on the intervention of interest. All 15-questions were peer-reviewed before use in any data collection procedures. At such time, the following participant’s demographics were also collected before starting the pre-test.

Table 2

Demographic Inclusion List

Demographics	Possible Choices
Gender	“Male,” “Female,” “Other,” & “Prefer not to answer.”
Age	“18-20,” “21-30,” “31-40,” “41-50,” “51-60,” & “61 and older”
Occupation	“Administration,” “MD,” “NP,” “RN,” “MA,” “Therapist,” “Recovery Coach,” & “Secretary”
Substance Abuse Experience (years)	“Less than 5,” “5-10,” “11-20,” “More than 20,” & “No experience.”

Data Privacy

Several measures were taken to promote data security and participant privacy when collecting and storing information. Electronic questionnaires encouraged anonymity by excluding identity lines. After disclosure signing, participants were prompted to fill out four demographic questions and a 13-item pre-test/15-item post-test before submitting the unidentifiable forms. The data from said forms were handled solely by the PD and was transferred into a password-protected Excel document. Data was stored on the University of Arizona's College of Nursing cloud box service. Files uploaded to box received 256-bit advanced encryption standard (AES) security that satisfies privacy requirements and international compliance (Box, 2020).

Data Analysis

All data calculations in this QI improvement project were performed in Excel. Original data collected from electronic questionnaires and surveys were exported into a password-protected Excel document. The data was prearrangement in Excel due to anticipating generating future graphics. Participants were deidentified as "P-001," "P-002" and so on down the first row starting at column A (row 2) with the label "Participants" in column A, row 1 and test questions "Q1" through "Q15" across row 1 starting at column B. Answers to the first six multiple-choice questions received binary coding. "Incorrect" responses were given the code "0" while "Correct" answers received the code "1." The bottom nine Likert scale questions received similar treatment, except their answers were filled with one of the five attitude responses from "Strongly Disagree" to "Strongly Agree." Questionnaire responses were analyzed by comparing the percentage difference between correctly answered pre-test compared to post-test questions to

assist in quantifying any differences after training. Participant’s demographics, pre-/post-test, and pre-/post-Likert results were converted to bar graphs by navigating to “Insert,” “Insert Column or Bar Chart,” and lastly, “3-D Column” before choosing the desired display design. See the table below that matches the collected data with its level of measurement.

Table 3

Data and Level of Measurement

Data	Level of Measurement
Demographics	Categorical Data
Pre-/post-test	Categorical Data
Pre-/post-Likert	Ordinal data

Guided by the MFI, this QI project aimed to increase MHC provider and staff knowledge and intention to use the ASI tool to manage OUD patient treatment plans. A one-group, asynchronous PowerPoint training was the intervention between a pre-/post-questionnaire quantitative design. The e-training focused on the ASI instrument’s proper administration and adaption into clinical practice. Based on the DOI, not only should future adopter’s perspective towards a new idea be shifted to optimism, but they should also experience adoption decision activities that encourage behavior change (Rodgers, 2003). These activities that expose future adopters to enough innovation use to warrant acceptance or rejection were done by employing the e-lecture that emphasized the ASI tool’s relative advantage (Rodgers, 2003). The training’s educational content was retrieved from the ASI manual that provides instructions for the instrument. The pre-test (17-item) questionnaire and post-test (19-item) questionnaire were adapted from said manual and the SAAS to evaluate participants’ knowledge and intention to use

respectfully. Collected data was de-identified and analyzed on Excel to determine the percentage difference of correct answers between the pretest/posttest design.

RESULTS

Outcomes

This QI project's purpose was to determine if interventional ASI education could increase provider and staff's knowledge and intent to use the ASI tool to treat patients with opiate addiction. Participants' feedback was recorded by asynchronous pre- and post-questionnaires to capture any differences between the surveys after receiving intermediate ASI training. Analyzed outcomes are divided into three sections: participant's demographics, multiple-choice questions, and Likert-scale responses.

Response Rate and Sample Size

The ASI training launched on Qualtrics was available for two weeks, between August 28, 2020, to September 11, 2020 (Appendix F). Of the 47 invited MHC employees to participate in the ASI training, eight individuals opened the education, two did not answer the consent form, and six participated to completion. The two incomplete surveys were discarded to uphold data integrity to make a final sample size of six participants, for a 12.8% response rate. Among these six survey takers, none elected to withdraw their participation, and no harm to human subjects occurred during the ASI's training implementation.

Demographics

Of the six total participants, the highest proportion by occupation was three recovery coaches (N=3; 50%), followed by two therapists (N=2; 33.3%) and a nurse practitioner (N=1; 16.7%). All test takers identified with the female gender (N=6; 100%) and consisted of the age

groups 21-30 (N=3; 50%), 41-50 (N=1; 16.7%), and 51-60 (N=2; 33.3%). Participants' years of substance abuse treatment experience was the most diverse demographic measure, representing two with less than five years (N=2; 33.3%) and one (16.7%) in the remaining categories: no experience (N=1), 5-10 (N=1), 11-20 (N=1), and more than 20 (N=1) years of experience. The demographic breakdown can be seen in table 4 below.

Table 4

Demographics

Gender	Age	Occupation	Substance Abuse Treatment Experience
Female 100% (N=6)	18-20 (N=0)	Recovery Coach 50% (N=3)	No experience 16.7% (N=1)
Male 0% (N=0)	21-30 50% (N=3)	Therapist 33.3% (N=2)	Less than 5 33.3% (N=1)
Other 0% (N=0)	31-40 (N=0)	NP 16.7% (N=1)	5-10 16.7% (N=1)
Prefer not to answer 0% (N=0)	41-50 16.7% (N=1)	RN (N=0)	11-20 16.7% (N=1)
	51-60 33.3% (N=2)	MD (N=0)	More than 20 16.7% (N=1)
	61 and older (N=0)	Administration (N=0)	

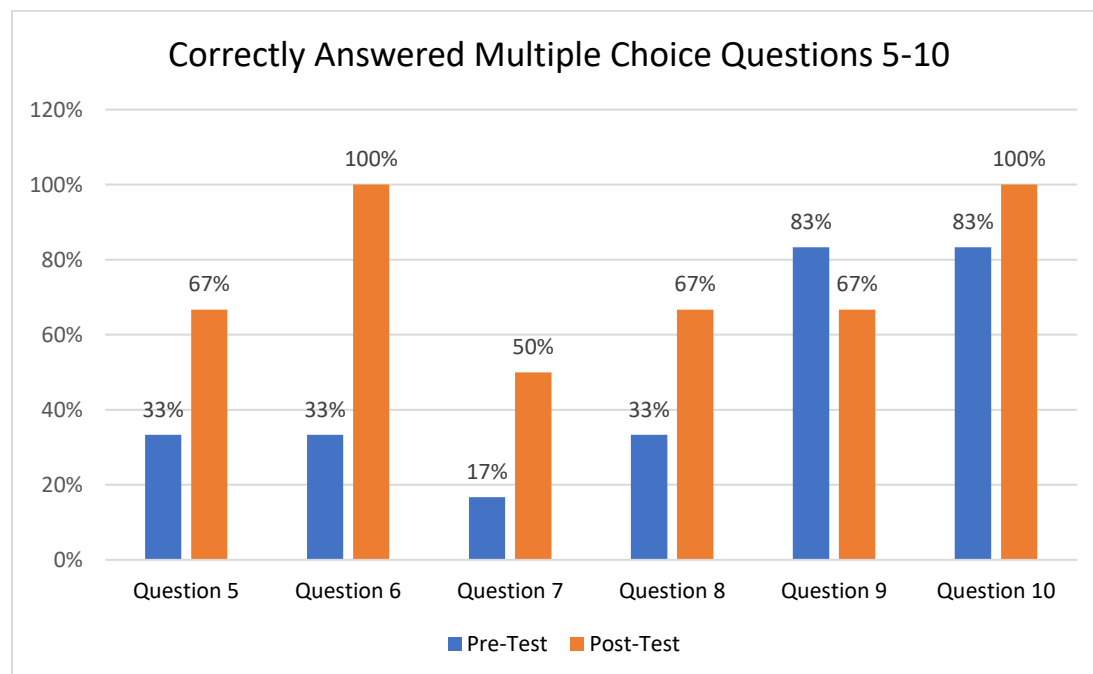
Multiple-Choice Questions

Participants were expected to answer six multiple-choice questions before and after the training on both the pre- and post-questionnaires, which all six respondents completed. Questions 5 and 8 both had an equal 33.3% correct pre-test score and a 66.7% accurate post-test score; this is a +33.4% total score improvement. Questions 10 and 6 had the least and most significant change in pre-/post-test scores respectfully. Question 10 changed from an 83.3% correct pre-test score to a 100% (+16.7% difference) correct post-test score, while Question 6 had a +66.7%

improvement from a 33.3% pre-test score to 100% correctly answered post-test score. Question 7 results also showed improvement in changing from a 16.7% correct pretest to a 50% correct post-test score (+33.3% difference). Lastly, Question 9 was the only multiple-choice question that had an adverse change in testing performance results between interventional learning. It changed from an 83.3% correct pre-test score to a 66.7% accurate post-test score average (-16.6% decrease). Out of the six participants answering six questions each per test (36 questions total), they got an average overall correct score of 47.2% for the pre-test and 75% for the post-test. This represents a +27.8% cumulative positive score change. See Figure 7 below for a graphic comparison of the pre-/post-test percentage of correct answers.

Figure 7

Correctly Answered Multiple Choice Questions



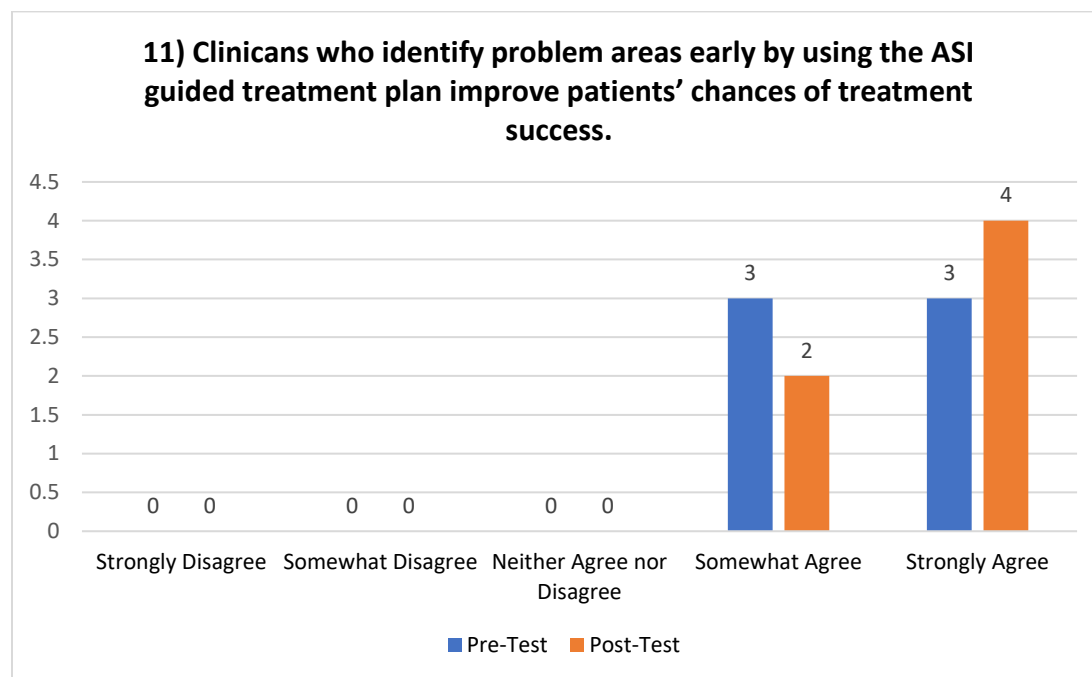
Likert-Scale Questions

Participants were asked to complete nine Likert questions, seven for the pre-test, and the same seven with an additional two questions for the post-test (nine total). Each question is a 5-point Likert-scale, spanning: a) strongly agree, b) somewhat agree, c) neither agree nor disagree, d) somewhat disagree, and e) strongly disagree. Questions were intended to measure healthcare professionals' intention to use the ASI tool to treat their OUD patients. Test takers pre- and post-Likert responses are explained with descriptions and bar graphs below in questions 11-19.

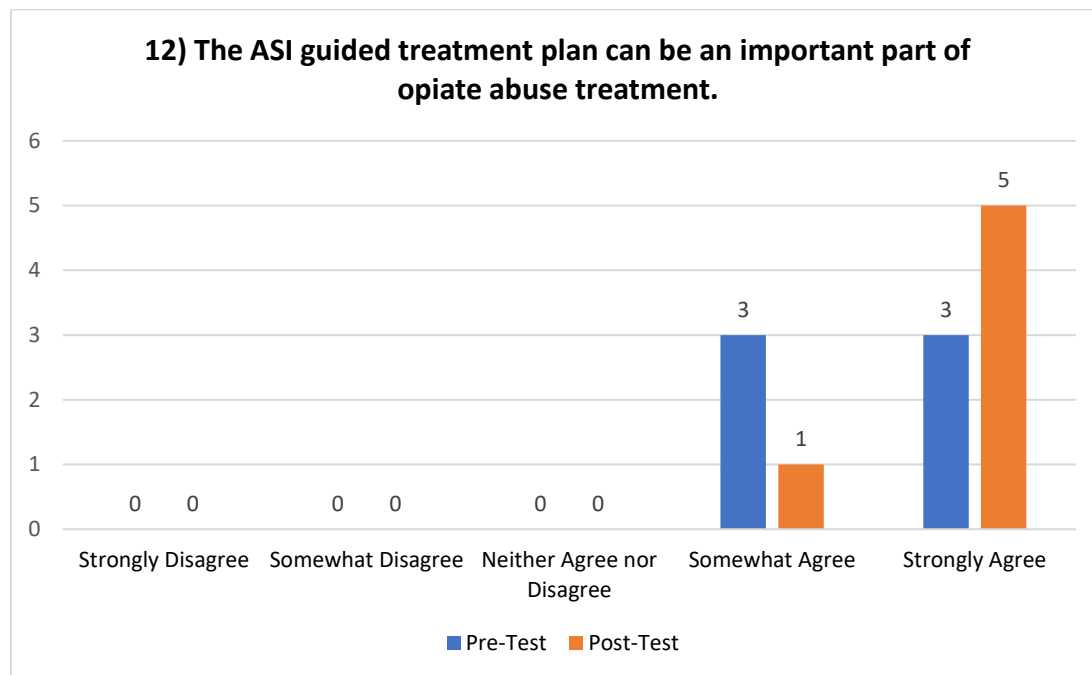
Question 11 assessed healthcare professionals' belief that early problem area identification with the ASI improves patient's treatment success rates. Participants' initial pre-test belief level to the statement was generally positive, seen with somewhat agree (N=3; 50%), and strongly agree (N=3; 50%). This belief further strengthened after interventional ASI training to slightly increase the sample size's (N=6) overall buy-in to somewhat agree (N=2; 33.3%) and strongly agree (N=4; 66.7%). This is a one-point (+16.7%) increase in attitude strength from somewhat to strongly agree between the pre- and post-tests that ASI early problem area identification improves patients' treatment success rates. See Figure 8 below for a graphic representation of the respondent's attitude change.

Figure 8

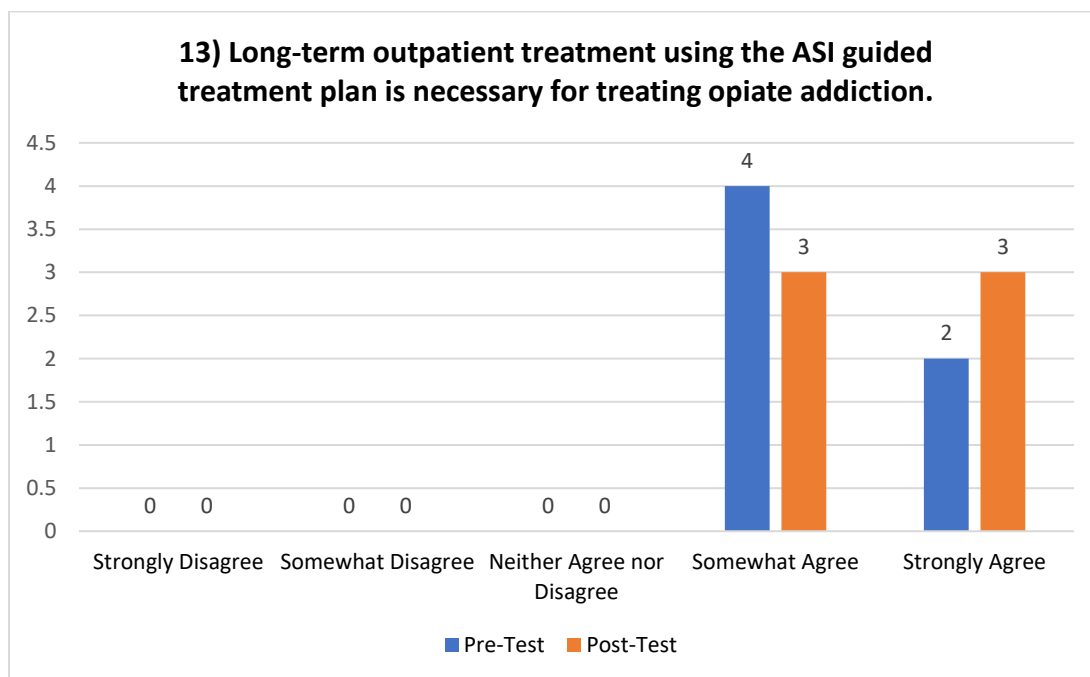
Early Problem Area Identification with ASI Improves Treatment Success



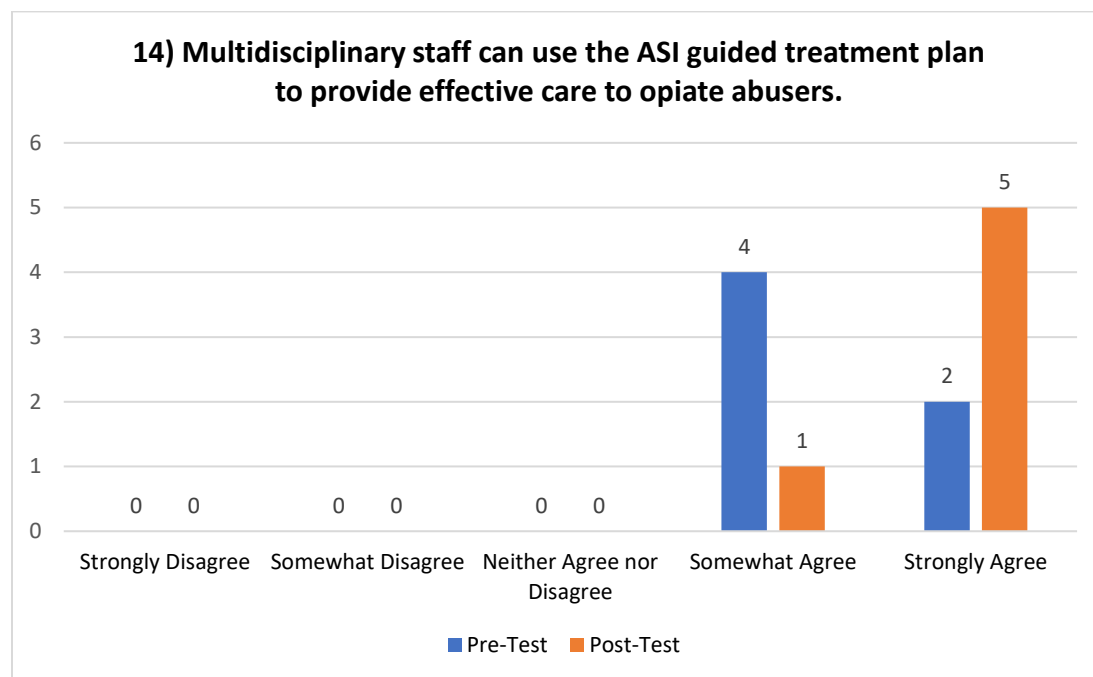
Question 12 measured respondent's perspective of the ASI's importance in opiate abuse treatment. This statement also saw a two-point (+33.3%) overall increase between the pre- and post-test surveys. This change can be seen from the pre-tests selections of three somewhat agree (N=3; 50%), and three strongly agree (N=3; 50%) to the improved post-tests votes of one somewhat agree (N=1; 16.7%), and five strongly agree (N=5; 83.3%) after ASI education. Participants favorably agreed with the ASI tool's importance in opiate abuse treatment. Figure 9 below depicts this two-point change from somewhat agree to strongly agree.

Figure 9*ASI Importance in Abuse Treatment*

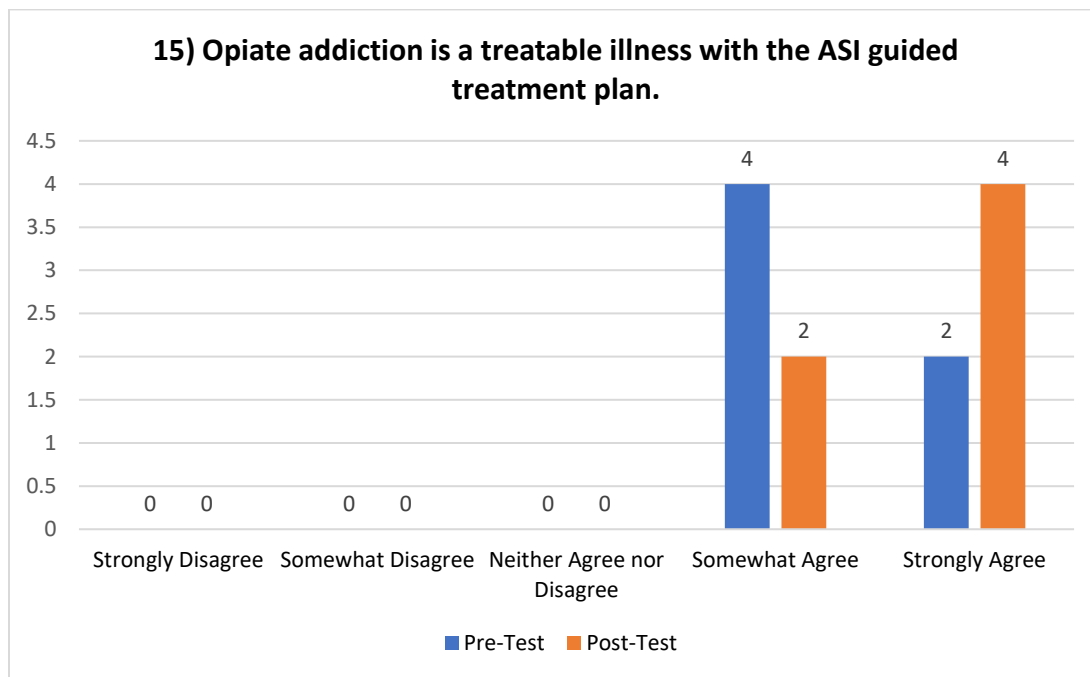
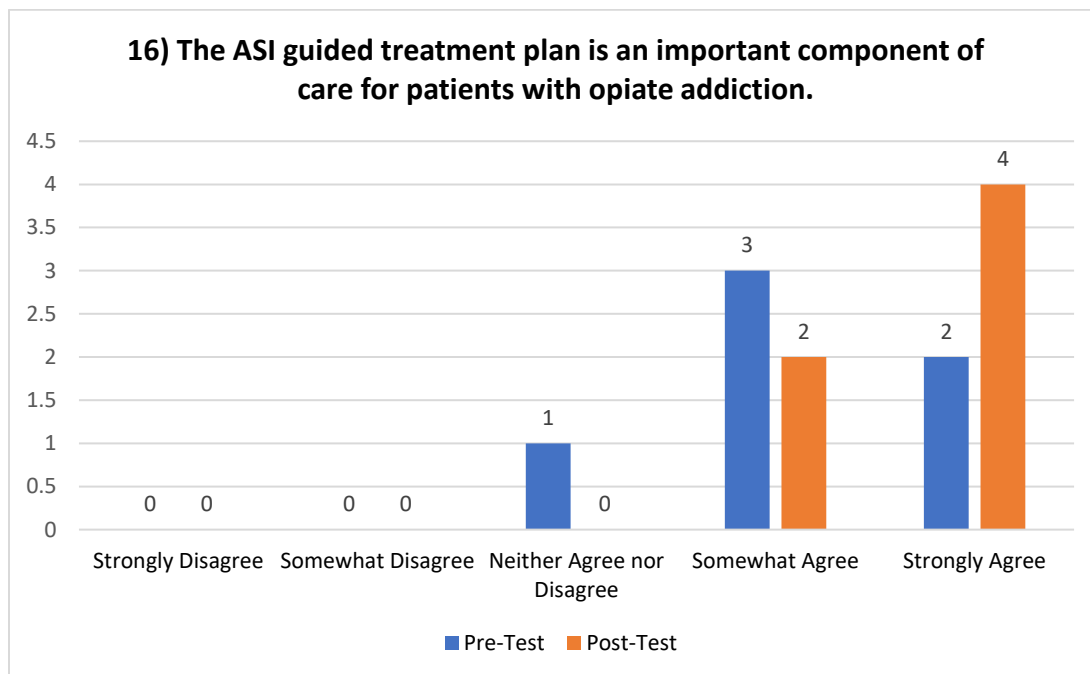
Question 13 evaluated the test taker's attitude towards the ASI's necessity in treating opiate addiction. Their attitude was favorable towards the statement falling 100% within the Likert scales agreement portion. Before ASI education, voters selected four (N=4; 66.7%) somewhat agree, and two (N=2; 33.3%) strongly agree on the pre-test. However, after the said intervention, participants' buy-in further increased to three (N=3; 50%) somewhat agree, and three (N=3; 50%) strongly agreed in post-test collective results. Overall, this is a one-point (+16.7%) increase in Likert agreeance of the ASI's necessity in treating opiate addiction. See Figure 10 below for a visualization of this change.

Figure 10*ASI Necessity in Addiction Treatment*

Question 14 rated the six subjects' attitudes towards the ASI's usefulness when applied by multidisciplinary staff to treat opiate abusers. Pre-test scores favored this statement with only somewhat and strongly agree votes at four (N=4; 66.7%) and two (N=2; 33.3%) votes respectfully. After innovation training, these selections changed to one (N=1; 33.3%) somewhat agree, and five (N=5; 83.3%) strongly agree. This change favors the Likert question by three points (+50%) between the pre-test and post-tests' collective scores. See Figure 11 below for a graphic representation of the respondent's attitude change.

Figure 11*ASI Usefulness in Abuse Treatment*

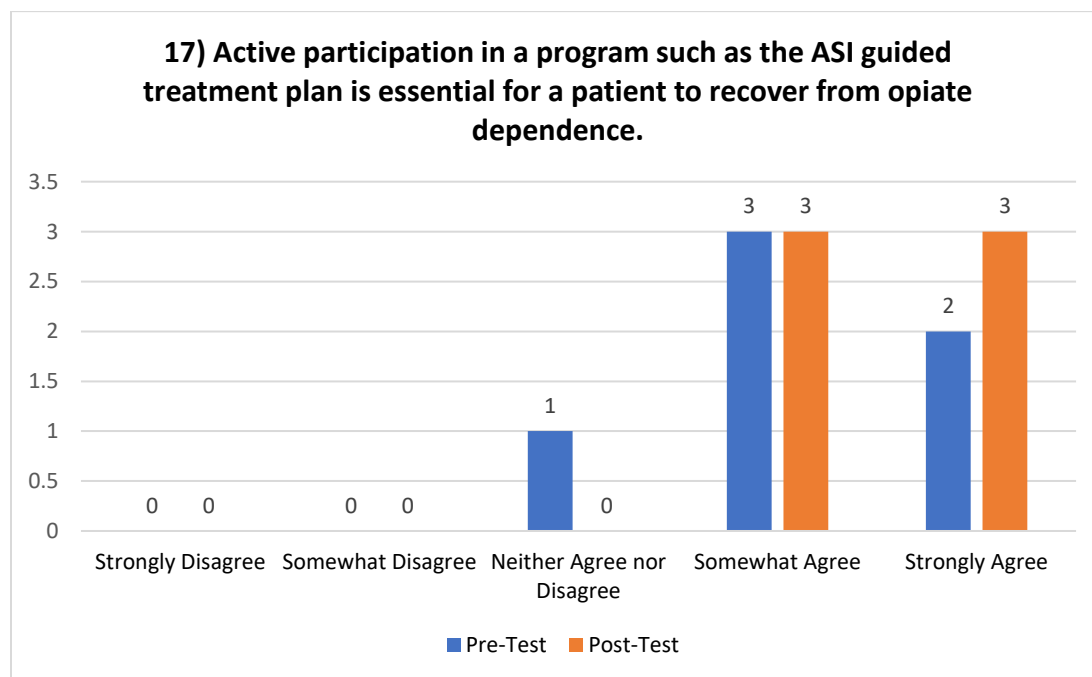
Questions 15 and 16 assessed participants' belief that the ASI can: a) treat opiate addiction and b) is an important component of opiate addiction care respectfully. Initial pre-test results for both Likert statements were similar. Participants chose four (N=4; 66.7%) somewhat agree, and two (N=2; 33.3%) strongly agree for Question 15, and three (N=3; 50%) somewhat agree, two (N=2; 33.3%) strongly agree, and one (N=1; 16.7%) neither agree nor disagree for Question 16. The two-questions post-test scores were identical, receiving two (N=2; 33.3%) somewhat agree, and four (N=4; 66.7%) strongly agree. This represents a two-point (+33.3%) and three-point (+50%) stronger score change for Questions 15 and 16, respectfully. Figures 12 and 13 below depicts these changes.

Figure 12*Opiate Addiction is Treatable with the ASI***Figure 13***ASI Importance in Addiction Treatment*

Question 17 evaluated voter's belief of the essentialness that a treatment program such as the ASI has for patient's opiate dependence recovery. Participant's attitude towards this statement was the most diverse, seen with one (N=1; 16.7%) neither agree nor disagree, three (N=3; 50%) somewhat agree, and two (N=2; 33.3%) strongly agree in pre-test scoring. After the ASI training, the subject's post-test agreeance changed to three (N=3; 50%) somewhat agree, and three (N=3; 50%) strongly agree. Overall, the Likert statement had a two-point (+33.3%) score change towards a stronger attitude acceptance of the ASI's essentialness in patients' opiate dependence recovery. See Figure 14 below for a visualization of this change.

Figure 14

ASI Essentialness to Opiate Dependence Recovery



Questions 18 and 19 measured participant's post-intervention attitude only of the ASI's: a) proposed implementation plan being an appropriate application at MHC, and b) staff's likelihood to use said treatment plan. Final results were three (N=3; 50%) somewhat agree, and

three (N=3; 50%) strongly agree for Question 18, and one (N=1; 16.7%) neither agree nor disagree, two (N=2; 33.3%) somewhat agree, and three (N=3; 50%) strongly agree votes for Question 19. Cumulative scores for Questions 18 and 19 made up 100%, and 83.3% of the Likert scales agree with portions respectfully. See Figures 15 and 16 below for graphic representations of the respondent's attitude towards the ASI's appropriate application at MHC and their likelihood to use the treatment instrument.

Figure 15

ASI Application Appropriateness

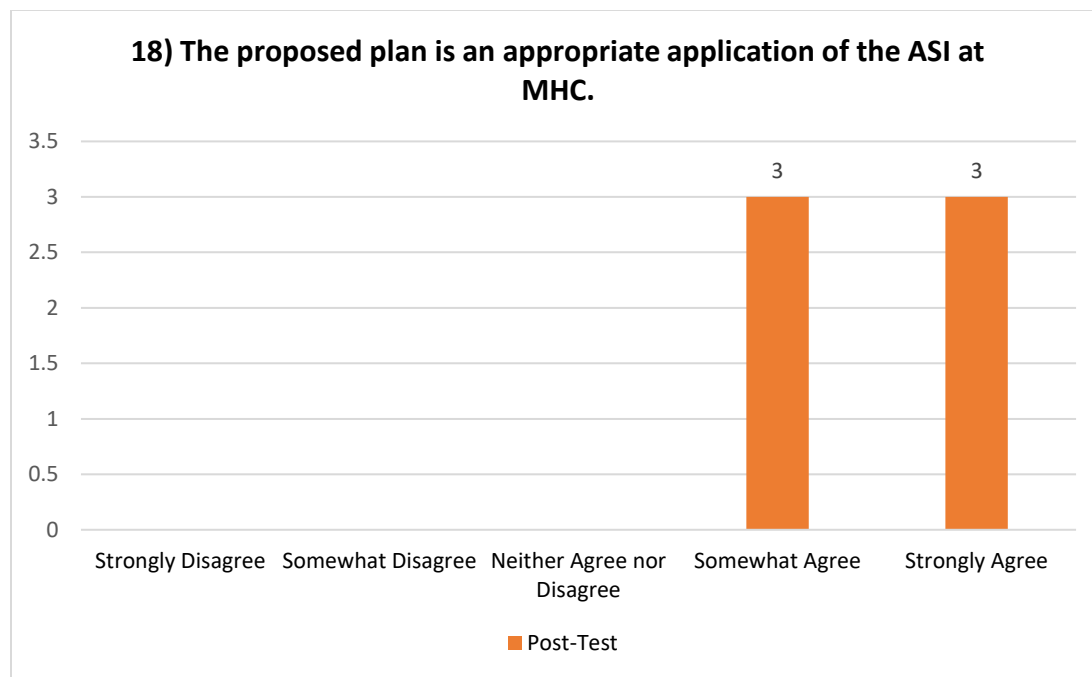
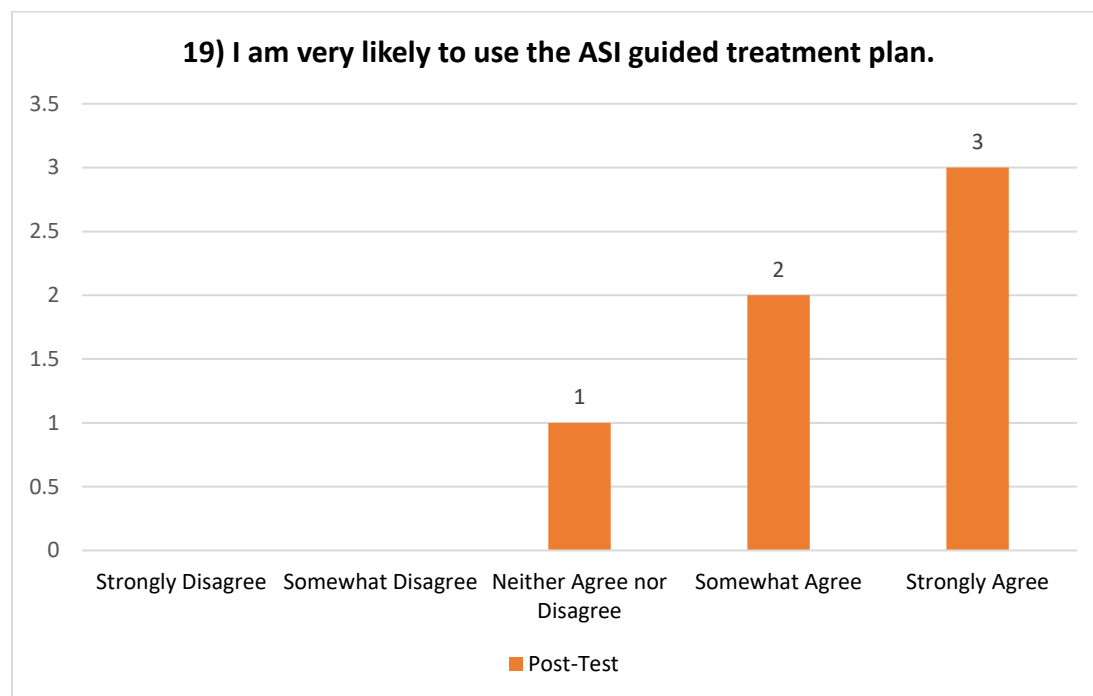


Figure 16*ASI Intent to Use*

The six participants who had 96 total possible votes across nine Likert questions pre- and post-test sum scores and percentages can be seen below in Table 5. Post-tests scores are divided between Likert questions 11-17 (84-points) and 18-19 (12-points).

Table 5*Sum of Likert Votes*

	Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree
Pre-Test					
11-17	0	0	2 (2.4%)	24 (28.6%)	16 (19%)
Post-Test					
11-17	0	0	0	14 (16.7%)	28 (33.3%)
18-19	0	0	1 (8.3%)	5 (41.7%)	6 (50%)

Scholarly Project Evaluation and Outcomes

Two weeks before beginning the implementation, the PD planned to hang physical fliers where staff frequent in employee break and meeting rooms. However, due to the coronavirus disease (COVID-19) pandemic, this step had to be changed to digital flyers only after transitioning from in-person to satellite work. Emails were initially meant to be sent by the PD through the student granted MHC email, but a site request to exclude staff that fell outside the CCBH's department was made. Invitation emails were sent by the EAA instead to better accommodate for this. This change resulted in the following 'operational staff' being removed from the survey pool: medical assistants and secretary staff. An unintended consequence of this shrunk the overall pool of possible participants down to six disciplines from eight.

DISCUSSION

Summary

American opiate use disorder prevalence and the unprecedented public health complications, crippling treatment expenses, and growing death toll that followed have escalated enough to be considered a national crisis. Because of this, greater integration of OUD treatment models in outpatient care settings is necessary to meet the overwhelming care demands (Korthuis et al., 2017). To better supply this, an ASI guided treatment plan was implemented at MHC as a means to deliver and manage the three essential components of MAT: a) patient monitoring, b) therapeutic counseling, and c) FDA approved medications (Maglione et al., 2018). The ASI has a well-established reputation in evidence-based practice research to provide reliable and valid addiction treatment care management. This instrument's strengths were combined with MHC's already capable therapy services (Appendix E) to execute the multi-disciplinary care that drug

users often require due to their typically more complex social and medical demands (Cushman et al., 2016; Thylstrup et al., 2018).

The purpose of this QI project was to increase provider and staff's ASI knowledge and their intention to use the innovation to standardize OUD patient management. Training on the change initiative was delivered by asynchronous education administered between a pretest/posttest quantitative design. Consenting participants' knowledge and attitude towards the guided treatment plan was evaluated with multiple-choice and Likert-scale questions respectfully for measurable change results of the innovation's effectiveness.

Cumulative pre-test and post-test scores in both measurement forms (questions & Likert) had a positive change response between questionnaires, suggesting that the ASI training intervention was successful. Provider and staff's ASI knowledge before the innovation peaked at 47.2% correctly answered pre-test multiple-choice questions. These same questions correct percentage after ASI education increased to a 75% correct post-test score. This +27.8% cumulative positive score change also exceeded this QI project's goal of a 10% knowledge gain by +17.8%, which is quite reassuring. Ultimately, these numbers support provider and staff's increased ASI knowledge after receiving the interventional education.

Equally impressive attitude changes between pre- and post-Likert statements were also observed. Test takers' attitude to stronger agree changed from 16 (19%) strongly agree in the pre-test sum to 28 (33.3%) strongly agree in the post-test sum (Likert 11-17). This represents a +14.3% (12-point) stronger provider and staff buy-in for the ASI guided treatment after innovation training in the following areas: the ASI's ability to improve treatment success, its importance and usefulness in abuse treatment, its importance and necessity in addiction

treatment, its essentialness to opiate dependence recovery, and if opiate addiction is treatable with the ASI. The last two Likert questions 18-19 that measured only post-test scores made up 91.7% (11-points) of the Likert scales agree with portions in areas: the ASI's appropriate application at MHC and the staff's intention to use the instrument. These scores indicate that participants support the implementation of the innovation.

The strengths of this QI project also contributed to its weaknesses. The ASI is a multi-department level innovation and, as a result, had to span several disciplinary professionals' seal of approval in the planning stages. This became a strength as it forced the project to go through multiple maturing and evolutionary changes, which may have positively attributed to the favorable outcomes reported above due to the increased refining. Unfortunately, coming to a unanimous consensus of the ASI's intricate use at MHC that satisfied all parties was less than ideal due to the staff's understandably different objectives. This siloing between key stakeholders proved to be a noticeable barrier to optimal implementation. Additionally, the final sample size of six participants was another significant weakness of the study. There is a possibility that the less invested MHC employees who would likely have Likert scores reflective of this declined to participate. Therefore, their absence would leave only the highly invested test-takers and inadvertently skew the results to the reported overly positive outcomes.

Interpretation

Based on the key finding noted in this QI project, MHC providers and staff endorse the ASI as an appropriate and reliable tool to implement in the outpatient setting to collect SUD patient information and standardize opiate treatment management. The PD anticipated the positive reception and buy-in towards the innovation after training due to the ASI being

customized to the facilities' needs. The goal was to introduce the ASI as a better treatment alternative (relative advantage) that still applied familiar outpatient services; this assisted with the innovation's diffusion and reduced pushback (Emani et al., 2018; Rogers, 1983; 2002). A previous study that implemented the ASI using the DOI to meet an outpatient facility's current service needs also received a positive reception from staff (Fiske et al., 2020). Like this study, the researchers found benefit with resolving stakeholder's hesitancy towards a change by emphasizing the relative advantage it suggested to have over previous, less capable practices (Fiske et al., 2020). This tailored fitting to a unique setting needs is known to enhance program outcomes by optimizing the innovation's functioning (Janevic et al., 2016). Customization also creates a feeling of ownership within the key stakeholders, hence the ASI table being titled "MHC ASI Interdisciplinary Treatment Plan" (Appendix E) to foster further this buy-in (Janevic et al., 2016). Such methods arguably contributed to the provider and staff's strong ASI innovation acceptance in pre- and post-Likert results.

Implications (Practice, Education, Research and Policy)

The positive findings reported in this text of the provider and staff's increased ASI knowledge and intent to use presents some implications for the outpatient facility in practice, education, research, and policy. Considering the facility's substance addiction team is still growing and is limited to one provider specialist and a handful of other disciplinarians, these results may justify the effort to grant more focus and funding to that department. The ASI's long administration times present an issue for staff with their routine job duties that attempt to add this additional workload regardless of their level of interest in the tool. Future practice implications that intentionally and actively prioritize the ASI screenings by appointed staff members can

better ensure its completion. Writing these specific guidelines into the facility's policy can also set a standard that said appointed staff could meet for a measurable understanding of the time required to address this task.

Despite inadequate infrastructure, a means to succeed change is total factor productivity (TFP) that considers low resource facilities like MHC to achieve additional healthcare services (Karmann & Roesel, 2017). Increasing TFP is done by leveraging policy determinants to increase service quality over volume, which may qualify the healthcare facility for reimbursement schemes that rural health facilities can utilize (Karmann & Roesel, 2017). For example, value-based payment (VBP) schemes that prefer quality over quantity outcomes have been known to finance rural facilities telehealth services, which MHC is already providing (RHIhub, 2020).

Careful research should be done on the ASI's impact on MHC's patient population and overall service quality outcomes to determine what government reimbursements are available. This research is necessary as it has the potential to save the clinic considerable money, which will only justify further the ASIs corporation-wide use. The Marana healthcare system has 16 total facilities that can benefit from an addiction treatment screener that can potentially improve quality and reduce expenses (MHC, 2020a). Moving a pilot intervention towards a generalizable application will require more diverse sample pools to justify and infer this expanse (Polit & Beck, 2017). Acquiring such a sample can be done by increasing staff encouragement to receive the ASI education that has already been shown to be effective. Long-term goals are to provide this education systematically to each location that provides addiction treatment services,

followed by further research. And once again, this cycle of practice, education, research, and policy should repeat indefinitely until optimal performance is reached.

Limitations

Three significant limitations were apparent in this study, which includes small sample size, poor generalization, and bias. The initial goal for the participant sample size was 20 consenting MHC employees. However, this expectation plummeted to the six test-takers' turnout, which is only 30% of the desired outcome. Such a low sample number can be problematic because it influences the collected data's power and the result's statistical validity (Polit & Beck, 2017). This ultimately increases the chance of errors (Polit & Beck, 2017). A possible contributing factor to this low participation can be staff's increased work demand secondary to the ongoing COVID-19 pandemic. Employees' routine work environment and time-management skills were challenged as they transitioned to online video-conferencing applications and regular telephone calls when the former failed. Leisure time, which could have been taken advantage of in normal circumstances to complete the training, was replaced with increased troubleshooting demands and fewer client 'no shows' due to telehealth convenience. This combination of increased patient appointment compliance and work-related time-management demands understandably made completing an 'off the clock' ASI training difficult. Restricting invitations to email could also have limited response rates secondary to this single recruitment form. To better mitigate these problems, the ASI's initial one-week training availability was extended to two weeks to increase participation convenience and chance. Potential subjects were also prompted with an initial and reminder flyer.

Further limitation can be seen in this QI project's lack of generalization as it was customized and implemented at a single site. Any analyzed data and reported findings detailed in this study are unique to MHC only (University of Connecticut, n.d.). Research cannot be inferred upon other settings or people known as ecological and population validity respectfully (University of Connecticut, n.d.). This is especially true since the chance of bias from this one site exists. The great majority of the six participants all came from the therapy department (83.3%), seen with three recovery couches (N=3; 50%) and two therapists (N=2; 33.3%). Only one nurse practitioner (N=1; 16.7%) representing the clinical department replied to the training. This significant skewing towards the therapy department can risk bias due to similar training and disciplinarian backgrounds. Unfortunately, neither of these two limitations could have been mitigated against, especially since the operational department was removed from the recruitment roster.

COVID-19 Pandemic Implications

Before the pandemic's start and the rise of social distancing laws to limit COVID-19's spread, this QI project's intervention was meant to be delivered by an in-service presentation. Adjusting this in-person to asynchronous training resulted in additional rewriting and planning changes that needed to be promptly addressed to prevent falling off schedule. The pandemic's sudden arrival also made communication with key stakeholders more challenging. Conversations quickly had in-person moved to more inconvenient communication means such as email and scheduled phone calls. Lastly, the small sample size of six participants is likely a consequence of social distancing changes that prevented staff from taking advantage of the convenience of on-site in-service education that would have likely bolstered participation sample size numbers.

DNP Essentials Addressed

Several Doctor of Nursing Practice (DNP) Essentials were addressed in this study, but the most prominent were essentials one, three, five, and six. *DNP Essential I – Scientific Underpinnings for Practice*, is the fundamental understanding of humans’ biological and psychosocial needs (American Association of Colleges of Nursing [AACN], 2006, p. 8). A firm grasp of this scientific insight is necessary as it dictates why and how DNPs are uniquely suited to handle practice complexities (AACN, 2006). This essential may not be easily identifiable when reading this text but was unquestionably integral to the brainstorming process when building this project and persists as a consistent undertone from beginning to end. The human life-process though complex, has the same laws governing its course (AACN, 2006). It is each individual’s personal experiences during this course that affect their lives for better or worse. Healthcare professionals understand this and use science to adjust patient’s sails towards better outcomes. This QI project is this PD’s attempt to do just that.

DNP Essential III – Clinical Scholarship and Analytical Methods for Evidence-Based Practice, is the DNP’s ability to research literature, integrate change, and solve significant problems (AACN, 2006, p. 11). This collection of new scholarly knowledge to be applied in practice is evident in this QI project’s 100 reference list. Baseline knowledge of human needs from essential one was further amplified, particularly in substance addiction, to best treat this population’s patient needs. Synthesizing diverse sources into a coherent and usable action plan by correlating their similarities and differences is the foundation of essential three (AACN, 2006). This process was applied to OUD and the ASI literature to make the MHC ASI action plan addressed in this project. Attempting to do this without understating essential three would

have likely led to failure, which participants' positive buy-in towards the innovation does not suggest.

DNP Essential Vi – Interprofessional Collaboration for Improving Patient and Population Health Outcomes, defines the importance of executing centered treatment between the many healthcare disciplines (AACN, 2006, p. 14). Because the ASI addresses seven different domains, the rural outpatient clinic required an appropriate intervention capable of promoting collaboration among their diverse staff (De Vries et al., 2015; Thylstrup et al., 2018). The MHC ASI table was made to be this centralized practice model that employed the facility's addiction services, thereby allowing different professionals to contribute. Results from the staff's efforts will be reflected in the ASI's follow-up scores and will further encourage interdisciplinary collaboration at each proceeding evaluation. Establishing this practice guideline created a baseline standard for MHC's multidisciplinary care and allows the team to engage in complex practice analysis to deliver their services (AACN, 2006).

Lastly, *DNP Essential VII – Clinical Prevention and Population Health for Improving the Nation's Health*, emphasizes health promotion and disease prevention (AACN, 2006, p. 15). The goal of reducing illness is particularly important in addiction treatment. As it stands, half of America's preventable deaths are a direct consequence of poor lifestyle behaviors (AACN, 2006). Substance abuse is no exception to this. To counteract this, interventions need to be employed to identify and stop patients who indulge in self-harming before they surpass irreversible points. This rationale was incorporated into the MHC ASI's continuous monitoring plan. Its scheduled reassessments and adapting treatment plans' purpose is to prevent patient's severity domains CSs from extending into 'severe' ranges that are likely to cause the most

damage. Using the ASI intervention to access patients' patterns in this way presents a means to improve their health status (AACN, 2006). Administering such risk reduction interventions into practice is the highlight of essential seven and was integral to this QI project's purpose.

Conclusions

This QI project's outcomes indicate that interventional training increased provider and staff's ASI knowledge and intent to use the tool to treat SUD patients. Substance addiction is an all-encompassing disease that consumes abuser's physical well-being, psychological stability, socio-occupational achievement, and, ultimately, their remaining quality of life. The drug's pervasive nature is unforgiving, and when left unchecked, premature mortality surely awaits. Therefore, adequate solutions have to be just as systematic to oppose this threat. The ASI's holistic approach to addicts needs hierarchy is an effective care standard to deliver multidisciplinary care. Convincing the MHC staff of this relative advantage that exceeds any one component of traditional care alone was an objective of this project and proved sufficient to change their beliefs towards the intervention. What thoughts accept, behaviors follow. This project's positive results reinforce this logic by changing provider and staff's attitude and intent in favor of the ASI's use. The behavior modifications employed in this study's training are potent methods that deserve a place in clinical practice to combat substance addiction.

Plan for Sustainability

The MHC outpatient clinic has plans to use and evaluate the ASI MHC treatment plan to observe its patient population's effects. More ASI education will likely be required and is recommended at the time, especially for staff who were not exposed to it for this project. Future training will be this project's same education intervention or an improved iteration of this

tutoring to further promote its strengths. Procuring a larger pool of MHC employees with buy-in towards the intervention will be advantageous to the innovation's sustainability when the CCBH decides to give the intervention an in-depth clinical analysis. The PD offered to provide the clinic with additional education material if this proved to be the case.

Plan for Dissemination

The findings reported in this project will be disseminated twice, once to the UofA's College of Nursing and once to MHC. The UofA will receive a formal final defense poster presentation delivered over the video-conferencing zoom application (Appendix K). This defense will detail the study's purpose, intervention, and analyzed findings. The presentation will be done before three doctorate-level professors to evaluate the scholarly aptitude of the presented material. All demographic data has been de-identified and will be anonymous to the professors and any additional spectators during the defense. The MHC dissemination will be done by telephone conversation to the facility's CCBH. Similar to the college defense, the CCBH will be informed of the study's purpose, intervention, and analyzed findings. Additionally, special emphasis on what these results mean for his clinic will be given in straight forward details. The interventional training positively impacted participant's knowledge and attitude of the ASI. This behavior change of increased intention to use the tool is attributed to highlighting the ASI's superior substance treatment benefits. The CCBH will be encouraged to continue this same strategy when transitioning the staff to the planned clinical evaluation and for more long-term sustainability.

APPENDIX A:

MHC HEALTHCARE SITE APPROVAL/THE UNIVERSITY OF ARIZONA
INSTITUTIONAL REVIEW BOARD LETTER



July 9, 2020

University of Arizona Institutional Review Board
c/o Office of Human Subjects
1618 E Helen St
Tucson, AZ 85721

Please note that Mr. Tommie L. Butler, UA Doctor of Nursing Practice student, has the permission of the Marana Health Center (MHC) Main Clinic to conduct the quality improvement project, "Implementation of an Addiction Severity Index Education Lecture at Marana Integrative Healthcare."

Mr. Butler will conduct an online pre- and post-survey of interdisciplinary staff at the MHC Main Clinic after an asynchronous training on the Addiction Severity Index. He will recruit staff through email and flyers. Invitations will provide the project description, what participants will be asked to do, the time commitment, and two links to the online surveys. Mr. Butler has permission to collect this data through Qualtrics. His activities will be completed by September 26th 2020.

Mr. Butler has agreed to provide to my office a copy of the University of Arizona IRB-approved, stamped consent document before he recruits participants. Employees will not be allowed time from work duties to complete the surveys. He will also deliver a copy of aggregate results upon completion.

If there are any questions, please contact my office.

Signed,

Jon Reardon, MBA, MSW, LCSW

Chief of Clinical Behavioral Health
520-682-1091 Ext. 7142
jreardon@mhchealthcare.org

Behavioral Health Services

13395 N. Marana Main Street, Bldg B | Marana, AZ 85653

www.mhchealthcare.org



THE UNIVERSITY OF ARIZONA
**Research, Discovery
 & Innovation**

Human Subjects
 Protection Program

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

Date: July 30, 2020
Principal Investigator: Tommie Lee Butler

Protocol Number: 2007895439
Protocol Title: Implementation of an Addiction Severity Index Education Lecture at Marana Integrative Healthcare

Determination: Human Subjects Review not Required

Documents Reviewed Concurrently:
 HSPP Forms/Correspondence: *1 Determination of Human Research.pdf*

Regulatory Determinations/Comments:

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

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

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

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

APPENDIX B:
CONSENT DOCUMENT (CONSENT FORM)

Voluntary Consent Document

Description

This quality improvement project is designed to formulate and implement an evidence-supported approach to managing opiate addiction at Marana Health Center (MHC) using the Addiction Severity Index (ASI) guided treatment plan. The treatment plan combines the best of MHC services with the ASI powerful composite score calculations to enhance the interdisciplinary treatment team's clinical making decisions. The goal is to increase MHC staff's ASI familiarity and intention to use this tool as their standardized opiate treatment approach.

What Will Happen

With your approval, participation commitment entails:

- I. Complete a 17-item pre-test before participating in a 20-minute PowerPoint that revolves around ASI education.
- II. Upon e-lecture completion, a second 19-item post-test will conclude your appreciated commitment.
- III. The total time from start-to-finish is 43-minutes. Potential participants may complete these tasks at any time that suits their convenience.

Risks and Benefits

The education-based training poses no expected safety concerns to staff that choose to participate. With your contribution, the intention is further to improve opiate treatment with the ASI at MHC.

Participant's Rights

Participation in the training session is an appreciated gesture, not a requirement. Anyone that declines attendance will not receive personal or professional backlash as a result of their decision. You can withdraw your consent without explanation at any time.

Confidentiality

Surveys are completely anonymous, and any information collected at this time (i.e., age, occupation, etc.) will be done with the utmost care and not shared with outside parties. All data will be analyzed from a group perspective rather than on an individual basis, and any results will not be associated with the participant's names.

Questions and Concerns

Questions and concerns can be directed to Tommie Lee Butler, DNP-PMHNP Candidate by phone or email at 623-565-0709/ tommieleebutler@email.arizona.edu

By agreeing to participate, you are indicating that: you are at least 18 years of age, and you have read and comprehended the informed consent.

‘Yes, I agree to participate in the project.’

APPENDIX C:
RECRUITMENT MATERIAL (RECRUITMENT FLYERS)

Reminder Recruitment Flyer

Addiction Severity Index (ASI)

Marana Health Center

Survey Opens: 8/28/20

Survey Closes: 9/11/20

Fun PowerPoint

The e-lecture is meant to be an informative presentation on bridging the ASI screening tool to MHC services. The goal of this ASI guided treatment plan is to standardize substance use disorder patient care.

For Questions:

tommieleebutler@email.arizona.edu or (623) 565-0709

APPENDIX D:
EVALUATION INSTRUMENTS (PRE-QUESTIONNAIRES AND POST-
QUESTIONNAIRES)

Pre-Questionnaire

Demographic Questions

1) Gender

a. Male b. Female c. Other d. Prefer not to answer

2) Age

a. 18-20 b. 21-30 c. 31-40 d. 41-50 e. 51-60 f. 61 and older

3) Occupation

a. Administration b. MD c. NP d. RN e. MA f. Therapist g. Recovery Couch h. Secretary

4) Substance Abuse Treatment Experience (years)

a. Less than 5 b. 5-10 c. 11-20 d. More than 20 e. No experience

Multiple Choice Questions

5) All of the following are potential problem areas measured by the Addiction Severity Index (ASI) EXCEPT

- a) Psychiatric Health
- b) Legal Status
- c) Educational Status
- d) Social Relationships

6) With which of the following patients would it be most appropriate to use the Addiction Severity Index (ASI)?

- a) David, a 45-year-old male addicted to pain killers, who was released from an 8-year incarceration 15 days ago.
- b) Sarah, a 33-year-old female who has been unable to maintain more than 6 months of opiate sobriety at a time for over ten years.
- c) Timothy, a 12-year-old boy whose principal caught him smoking heroin.
- d) Jessica, a 17-year-old female whose mother is concerned about her failing grades and drug use.

- 7) **What is an appropriate description for the ASI composite scores (CS)?**
- a) A powerful measure of a patient's changed response to care between ASI assessments.
 - b) A capable measure of a patient's current status in a problem area.
 - c) A useful clinical summary for initial patient treatment planning and referral.
 - d) A rating used for all treatment planning and referral.
- 8) **What is an appropriate description for the ASI interviewer severity rating (ISR)?**
- a) A capable measure of a patient's current status in a problem area.
 - b) A powerful measure of a patient's changed response to care between ASI assessments.
 - c) A rating used for all treatment planning and referral.
 - d) A useful clinical summary for initial patient treatment planning and referral.
- 9) **If a patient shows no improvement between the second and third ASI follow-up, the treatment plan requires**
- a) No change
 - b) A decrease in intensity
 - c) An increase in intensity
 - d) Cancellation
- 10) **The Marana ASI guided treatment plan is made to provide ____ focused care.**
- a) Medication
 - b) Interdisciplinary
 - c) Skills Learning
 - d) Therapy

Likert Questions

- 11) **Clinicians who identify problem areas early by using the ASI guided treatment plan improve patients' chances of treatment success.**
- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree e) Strongly disagree
- 12) **The ASI guided treatment plan can be an important part of opiate abuse treatment.**
- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree e) Strongly disagree

13) Long-term outpatient treatment using the ASI guided treatment plan is necessary for treating opiate addiction.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

14) Multidisciplinary staff can use the ASI guided treatment plan to provide effective care to opiate abusers.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

15) Opiate addiction is a treatable illness with the ASI guided treatment plan.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

16) The ASI guided treatment plan is an important component of care for patients with opiate addiction.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

17) Active participation in a program such as the ASI guided treatment plan is essential for a patient to recover from opiate dependence.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

Post-Questionnaire

Demographic Questions

1) Gender

a. Male b. Female c. Other d. Prefer not to answer

2) Age

a. 18-20 b. 21-30 c. 31-40 d. 41-50 e. 51-60 f. 61 and older

3) Occupation

a. Administration b. MD c. NP d. RN e. MA f. Therapist g. Recovery Couch h. Secretary

4) Substance Abuse Treatment Experience (years)

a. Less than 5 b. 5-10 c. 11-20 d. More than 20 e. No experience

Multiple Choice Questions

5) All of the following are potential problem areas measured by the Addiction Severity Index (ASI) EXCEPT

- a) Psychiatric Health
- b) Legal Status
- c) Educational Status
- d) Social Relationships

6) With which of the following patients would it be most appropriate to use the Addiction Severity Index (ASI)?

- a) David, a 45-year-old male addicted to pain killers, who was released from an 8-year incarceration 15 days ago.
- b) Sarah, a 33-year-old female who has been unable to maintain more than 6 months of opiate sobriety at a time for over ten years.
- c) Timothy, a 12-year-old boy whose principal caught him smoking heroin.
- d) Jessica, a 17-year-old female whose mother is concerned about her failing grades and drug use.

- 7) **What is an appropriate description for the ASI composite scores (CS)?**
- a) A powerful measure of a patient's changed response to care between ASI assessments.
 - b) A capable measure of a patient's current status in a problem area.
 - c) A useful clinical summary for initial patient treatment planning and referral.
 - d) A rating used for all treatment planning and referral.
- 8) **What is an appropriate description for the ASI interviewer severity rating (ISR)?**
- a) A capable measure of a patient's current status in a problem area.
 - b) A powerful measure of a patient's changed response to care between ASI assessments.
 - c) A rating used for all treatment planning and referral.
 - d) A useful clinical summary for initial patient treatment planning and referral.
- 9) **If a patient shows no improvement between the second and third ASI follow-up, the treatment plan requires**
- a) No change
 - b) A decrease in intensity
 - c) An increase in intensity
 - d) Cancellation
- 10) **The Marana ASI guided treatment plan is made to provide ____ focused care.**
- a) Medication
 - b) Interdisciplinary
 - c) Skills Learning
 - d) Therapy

Likert Questions

- 11) **Clinicians who identify problem areas early by using the ASI guided treatment plan improve patients' chances of treatment success.**
- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
 - e) Strongly disagree
- 12) **The ASI guided treatment plan can be an important part of opiate abuse treatment.**
- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
 - e) Strongly disagree

13) Long-term outpatient treatment using the ASI guided treatment plan is necessary for treating opiate addiction.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

14) Multidisciplinary staff can use the ASI guided treatment plan to provide effective care to opiate abusers.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

15) Opiate addiction is a treatable illness with the ASI guided treatment plan.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

16) The ASI guided treatment plan is an important component of care for patients with opiate addiction.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

17) Active participation in a program such as the ASI guided treatment plan is essential for a patient to recover from opiate dependence.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

18) The proposed plan is an appropriate application of the ASI at MHC.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

19) I am very likely to use the ASI guided treatment plan.

- a) Strongly agree b) Somewhat agree c) Neither agree nor disagree d) Somewhat disagree
- e) Strongly disagree

APPENDIX E:

PARTICIPANT MATERIAL (ASYNCHRONOUS POWERPOINT
PRESENTATION/MARANA HEALTH ASI GUIDED TREATMENT PLAN)

Asynchronous PowerPoint

Addiction Severity Index Guided Treatment Plan Education

Tommie Lee Butler
University of Arizona

Addiction Severity Index (ASI) Interdisciplinary	
Composite Score > 0.24	Sc...
Medication-Assisted Treatment (MAT) Services	I - F -
Intensive Outpatient Program (IOP) Groups - 3 Sessions Per Week	Medical Status
<ul style="list-style-type: none"> o SU Group - 1-3 Sessions Per Week o Moral Reconation Therapy (MRT) Group - 1 Session Per Week o Therapy Weekly 	Work/ Support
o Support Groups in the Community - 1-7 Days a Week	
Composite Score 0.04 - 0.24	Drug/Alcohol Use
Medication-Assisted Treatment (MAT) Services	
<ul style="list-style-type: none"> o SU Groups - 2 Sessions Per Week o Therapy Weekly 	Legal Status
o Support Groups in the Community - 1-7 days a Week	
Composite Score ≤ 0.04	Family/Social
Medication-Assisted Treatment (MAT) Services	
o SU Group - 1 Session Per Week	Relationships
Therapy	
o Support Groups in the Community - 1-7 days a Week	Psychi...
Lower Severity Rating (ISR)	

Introductions



Thank you for participating in the education session.



My name is Tommie, and I will be training you for the next 45-minutes.



Instructions: 1) Take pre-questionnaire, 2) Review the slides, 3) Take post-questionnaire.

Pre- Questionnaire

Please click **next arrow** to:

1. Accept Participation Consent.
2. Complete the 17-item pre-test.



Arizona's Opiate Problem



Death: **928** opioid-involved deaths (2017) (NIIDA, 2019b).



Pills: **205** million opioid pills prescribed (January-July, 2017) (ADHS, 2018a).



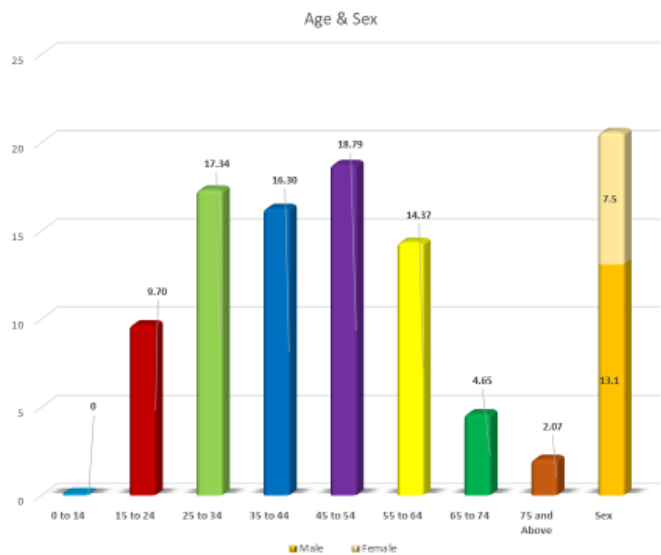
Statistics: One of America's fastest-growing states in drug overdose mortality (2016-2017) (CDC, 2018a).



Financial Burden: **\$143.6** million (2008) - **\$461.4** million (2018) (ADHS, 2018c).



10-Year Increase: By **321%** or **\$8,711** per healthcare encounter in 2018 (ADHS, 2018c).



Arizonian Opioid Deaths 2008-2018

- The highest Arizonian opiate-related death demographics:
 - Ages 45-54
 - The male sex (nearly double women)
 - Caucasian Race

Race	Number of Deaths
White	13.1
Black	8.0
American Indian	8.0
Hispanic	6.5
All Others	2.5

(ADHS, 2018c)

Needs Assessments

- Outpatient clinics are dominated with Medication Assisted Treatment (MAT) services, specifically Buprenorphine.
- However, despite one study increasing injection opiate user's post-hospitalization enrollment into outpatient clinics by 65%, retention dropped to 13.7% by six months (Cushman et al., 2016).
- The researchers concluded that more complex opiate users also have more complex social and medical demands that necessitates more intensive care beyond medication alone (Cushman et al., 2016).
- The proposed ASI guided treatment plan intends to be this more intense treatment solution which addresses both general health and social in its seven domains (De Vries et al., 2015; Thylstrup et al., 2018).



Addiction Severity Index

- The ASI is literature supported to have high **predictability**, **validity**, and **reliability** in Substance Use Disorder (SUD) treatment.
- The **200-item** semi-structured interview achieves versatility by addressing problems related to both SUD and functional status across seven fields: (De Vries et al., 2015; Thylstrup et al., 2018).



LEGAL STATUS



DRUG USE



PSYCHIATRIC HEALTH



ALCOHOL USE

EMPLOYMENT
STATUS

GENERAL HEALTH

FAMILY AND SOCIAL
RELATIONSHIPS

LEGAL STATUS



DRUG USE



PSYCHIATRIC HEALTH



ALCOHOL USE

EMPLOYMENT
STATUS

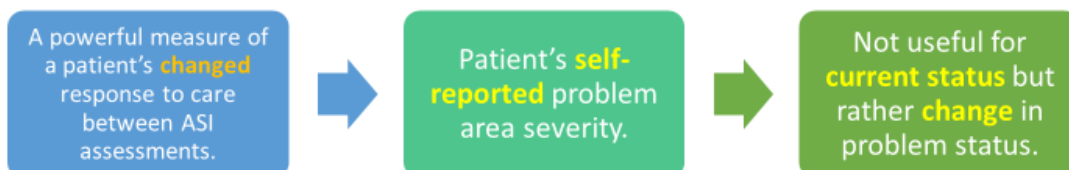
GENERAL HEALTH

FAMILY AND SOCIAL
RELATIONSHIPS

- Each potential problem area measures the consequences of addiction on their respective domains by severity over the client's past **30-days** (Padyab et al., 2018).
- This severity is measured in **two** scores: **Composite Score** & **Interviewer Severity Rating**.
- The ASI is **NOT** appropriate for adolescents ages or recently incarcerated adults.

Measures

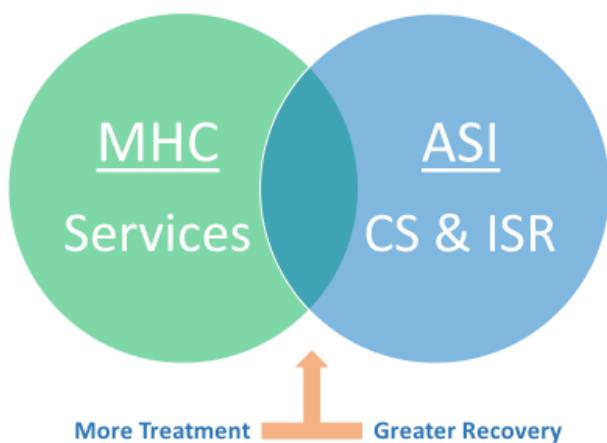
Composite Scores (CS) 0.00 - 1.00 score



Interviewer Severity Rating (ISR) 10-point scale



Retrofitting Services



- Adapting evidenced-based practice to real-world conditions is done by tailoring a facilities' existing services to the intervention's components (Janevic et al., 2016).
- In this case, the ASI's CS and ISR are aligned with MHC's treatments.
- The overlap of these two will be channeled through the variable of intensity (**more treatment**). This intensity will be used to reduce patient stagnation and promote recovery.

Addiction Severity Index Guided Treatment Plan

- The Interdisciplinary Treatment Plan bridges the ASI to Marana Health Center.
- This table combines the best of MHC services with the ASI's powerful composite scores to enhance clinical making decisions.
- The ASI's primary purpose is to measure a patient's **change response** to care.
- This change was adapted to MHC with graphical representation of least to most severe:
 - Subthreshold
 - Mild / Moderate
 - Severe

Marana Healthcare Addiction Severity Index (ASI) Interdisciplinary Treatment Plan		
Severe	Composite Score > 0.24	Score Change I - F - C
	o DETOX	_ _ - _ - _
	o Medication-Assisted Treatment (MAT) Services	_ _ - _ - _ Medical Status
	o Intensive Outpatient Program (IOP) Groups - 3 Sessions Per Week	_ _ - _ - _
	o SU Group - 1-3 Sessions Per Week	_ _ - _ - _ Work/ Support
	o Moral Reconciliation Therapy (MRT) Group - 1 Session Per Week	_ _ - _ - _
Mild / Moderate	Composite Score 0.04 - 0.24	_ _ - _ - _ Drug/Alcohol Use
	o Medication-Assisted Treatment (MAT) Services	_ _ - _ - _
	o SU Groups - 2 Sessions Per Week	_ _ - _ - _ Legal Status
	o Therapy Weekly	_ _ - _ - _
Subthreshold	Composite Score ≤ 0.04	_ _ - _ - _ Family/Social
	o Medication-Assisted Treatment (MAT) Services	_ _ - _ - _
	o SU Group - 1 Session Per Week	_ _ - _ - _ Relationships
	o Therapy	_ _ - _ - _
	o Support Groups in the Community - 1-7 days a Week	_ _ - _ - _ Psychiatric Status
Interviewer Severity Rating (ISR)		
[Severity Score _] - MHC staff will add their professional input based on the patient's mental health assessment.		

ASI Triage

- Severe:** Patients are potentially at greatest risk of drug relapse and non-compliance. Highest treatment intensity is recommended for their recovery.
- Mild/Moderate:** These patients can improve, stagnate, or worsen. Strategic monitoring and therapy can be the determining factor between their drug abstinence success or failure.
- Subthreshold:** Potentially least at-risk patients. This tier has the least aggressive treatment and is the most desired zone for all SUD patients to remain in.
- ISR:** Exercise your professional judgment here. Based on the collected information, your recommendation will build-upon what the table cannot triage.

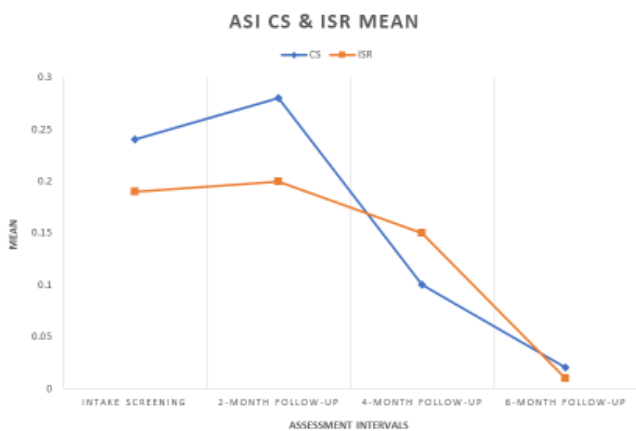
Marana Healthcare Addiction Severity Index (ASI) Interdisciplinary Treatment Plan		
Severe	Composite Score > 0.24	Score Change I - F - C
	o DETOX	_ _ - _ - _
	o Medication-Assisted Treatment (MAT) Services	_ _ - _ - _ Medical Status
	o Intensive Outpatient Program (IOP) Groups - 3 Sessions Per Week	_ _ - _ - _
	o SU Group - 1-3 Sessions Per Week	_ _ - _ - _ Work/ Support
	o Moral Reconciliation Therapy (MRT) Group - 1 Session Per Week	_ _ - _ - _
Mild / Moderate	Composite Score 0.04 - 0.24	_ _ - _ - _ Drug/Alcohol Use
	o Medication-Assisted Treatment (MAT) Services	_ _ - _ - _
	o SU Groups - 2 Sessions Per Week	_ _ - _ - _ Legal Status
	o Therapy Weekly	_ _ - _ - _
Subthreshold	Composite Score ≤ 0.04	_ _ - _ - _ Family/Social
	o Medication-Assisted Treatment (MAT) Services	_ _ - _ - _
	o SU Group - 1 Session Per Week	_ _ - _ - _ Relationships
	o Therapy	_ _ - _ - _
	o Support Groups in the Community - 1-7 days a Week	_ _ - _ - _ Psychiatric Status
Interviewer Severity Rating (ISR)		
[Severity Score _] - MHC staff will add their professional input based on the patient's mental health assessment.		

How It Works

- **Initial** ASI assessments will determine the patient's baseline category and treatment intensity.
- The higher up the chain a client places, the greater **frequency**, and **intensity** patients will receive care.
- Based on their **top 3** domains, appropriate MHC services that best prioritize the client's treatment needs will be administered.
- The acute goal is to increase MHC's **problem identification** and improve **resource allocation**.
- **Follow-up** ASI assessments will repeat this procedure indefinitely, **lowering**, **maintaining**, or **increasing** treatment demands as needed between each screening interval.
- Treatment is meant to be a holistic, **interdisciplinary** effort.

Severe	o DETOX	I - F - C
	o Medication-Assisted Treatment (MAT) Services	___ - ___ - ___
	o Intensive Outpatient Program (IOP) Groups - 3 Sessions Per Week	Medical Status
	o SU Group - 1-3 Sessions Per Week	___ - ___ - ___
	o Moral Reconciliation Therapy (MRT) Group - 1 Session Per Week	Work/ Support
	o Therapy Weekly	___ - ___ - ___
Mild / Moderate	o Support Groups in the Community - 1-7 Days a Week	___ - ___ - ___
	Composite Score 0.04 - 0.24	
	o Medication-Assisted Treatment (MAT) Services	___ - ___ - ___
	o SU Groups - 2 Sessions Per Week	Legal Status
	o Therapy Weekly	___ - ___ - ___
	o Support Groups in the Community - 1-7 days a Week	___ - ___ - ___
Threshold	Composite Score ≤ 0.04	
	o Medication-Assisted Treatment (MAT) Services	Family/Social
	o SU Group - 1 Session Per Week	___ - ___ - ___
	o Therapy	Relationships
	o Support Groups in the Community - 1-7 days a Week	___ - ___ - ___
		- - -

Desired Goal



*This is fabricated data for visual purposes only. Actual data collection has yet to be done.

- With each ASI follow-up assessment, the desired goal is to see **decreases** in both the CS and ISR.
- If seen, staff can assume the treatment plan is effective for the patient and requires **no change**.
- If not seen, more treatment plan **augmenting** is required to maximize client's recovery needs.

Post-Questionnaire

Please click **next arrow** to:

1. Complete the 19-item post-test.



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Marana Health ASI Guided Treatment Plan

Marana Healthcare Addiction Severity Index (ASI) Interdisciplinary Treatment Plan		
Severe	Composite Score > 0.24	Score Change
	○ DETOX	I - F - C
	○ Medication-Assisted Treatment (MAT) Services	___ - ___ - ___
	○ Intensive Outpatient Program (IOP) Groups - 3 Sessions Per Week	Medical Status
	○ SU Group - 1-3 Sessions Per Week	___ - ___ - ___
	○ Moral Reconciliation Therapy (MRT) Group - 1 Session Per Week	Work/ Support
	○ Therapy Weekly	___ - ___ - ___
	○ Support Groups in the Community - 1-7 Days a Week	___ - ___ - ___
Mild / Moderate	Composite Score 0.04 - 0.24	Drug/Alcohol Use
	○ Medication-Assisted Treatment (MAT) Services	___ - ___ - ___
	○ SU Groups - 2 Sessions Per Week	Legal Status
	○ Therapy Weekly	___ - ___ - ___
	○ Support Groups in the Community - 1-7 days a Week	___ - ___ - ___
Subthreshold	Composite Score ≤ 0.04	Family/Social
	○ Medication-Assisted Treatment (MAT) Services	___ - ___ - ___
	○ SU Group - 1 Session Per Week	Relationships
	○ Therapy	___ - ___ - ___
	○ Support Groups in the Community - 1-7 days a Week	Psychiatric Status
Interviewer Severity Rating (ISR)		
[Severity Score ___] – MHC staff will add their professional input based on the patient’s mental health assessment.		

APPENDIX F:
PROJECT TIMELINE

Completion Date	Planning	Pre-Implementation	Implementation	Evaluation
1/22/2020	Met with key stakeholders			
1/28/2020	First planning meeting with the Physician			
2/05/2020	Second planning meeting with the Physician			
2/19/2020	Third planning meeting with the Physician			
2/19/2020 & 2/21/2020	Voicemail left at the research & evaluation group with contact information			
2/26/2020	Emailed Alyssa Bell at the research & evaluation group			
2/28/2020	Email received from Alyssa Bell from research & evaluation group			
2/28/2020	Emailed the Physician and PMHNP			
3/17/2020	Meeting with the Physician and PMHNP			
3/26/2020	Met with the CCBH and therapy supervisor			
4/05/2020	Created an e-lecture implementation plan.			
4/07/2020	Requested permission to modify the Brief SAAS			
4/20/2020	Finalized e-lecture implementation plan.			
6/08/2020	Meeting between the PD, CCBH, physician, and therapy supervisor.			
7/08/2020		Passed DNP Project Proposal.		
7/14/2020		Submit IRB application		
7/30/2020		Received IRB approval		
8/28/2020			Emailed e-lecture to MHC staff.	
8/28/2020			ASI e-Lecture & Qualtrics surveys (open)	
9/11/2020			ASI e-Lecture & Qualtrics surveys (close)	
9/12/2020				Import results in Excel document, analyze data, and create graphs.

11/02/2020				Finalize and submit to DNP committee chair and assignment box.
11/11/2020				Report the QI results to the CCBH.

APPENDIX G:
LITERATURE REVIEW GRID

Project Question: In the MHC outpatient clinic, will a brief educational presentation increase staff’s knowledge of the ASI instrument and the increased intention to use in SUD patient’s treatment plans?

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
<p>Authors Butler, S., Black, R., McCaffrey, S., Ainscough, J., & Doucette, A.</p> <p>Title A Computer Adaptive Testing Version of the Addiction Severity Index—Multimedia Version (ASI–MV): The Addiction Severity CAT</p> <p>Authors Butler, S., Black, R., McCaffrey, S., Ainscough, J., & Doucette, A.</p> <p>Year 2017</p>	<p>Question/Hypothesis Will, a CAT version of the ASI’s performance, compare against the ASI–MV in substance use evaluation and problem area detection?</p>	<p>Design Research Study</p>	<p>Sample n = 4,419 (nonclinical) 1. n = 1,750 (low/moderate-risk community sample), 51.9% female, 11.3% Hispanic, 81.7% Caucasian, 10.6% African American, 0.5% American Indian/Alaskan Native, 0.2% Native Hawaiian/Other Pacific Islander, 1.0% Asian, 3.6% other, 2.5% multiracial, 55.0% high school/GED. 2. n = 2,669 (high-risk community sample), 42.2% female, 9.7% Hispanic, 78.6% Caucasian, 11.0% African American, 1.3% American Indian/Alaskan Native, 0.3% Native Hawaiian/Other Pacific Islander, 2.3% Asian, 3.2% other, 3.3% multiracial, 39.4% high school/GED.</p>	<p>Measure Addiction Severity Index: 1. Multimedia Version (ASI–MV) 2. Computer adaptive testing (ASI-CAT) version 3. Alcohol Use Disorders Identification Test (AUDIT) 4. Drug Abuse Screening Test (DAST-10)</p> <p>Data Collection Emailed survey Emailed assessment</p> <p>Analysis Substudy 1: Development and Qualitative Evaluation of an Item Pool. Substudy 2: Psychometric Analysis of the Item Bank. a) Moderate risk and high risk for substance use (sensitivity). b) AUDIT c) DAST-10</p>	<p>Outcomes The ASI–MV CAT is valid, reliable, and sensitive to change in substance use evaluation and problem area detection. The average ASI CAT’s completion time was significantly less than the average ASI–MV composite score completion time.</p> <p>ASI CAT Results</p> <ol style="list-style-type: none"> 1. Substance use diagnosis: (rpb = 0.420, p = .0001). 2. Alcohol use disorder: (rpb = 0.418, p = .0001). 3. SEM (reliability): Rxx > 0.70 (acceptable range). 4. Pearson correlation: p < .0001. 5. Administration time: p = .0002.

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
			<p>n = 845 (substance abuse treatment) 45.1% female, 3.9% Hispanic, 53.8% Caucasian, 42.0% African American, 0.6% American Indian/Alaskan Native, 0.2% Native Hawaiian/Other Pacific Islander, 0.4% Asian, 1.1% other, 1.9% multiracial, 52.9% high school/GED.</p> <p>Setting</p> <ol style="list-style-type: none"> 1. YouGov (online community) 2. 3 substance abuse treatment facilities in North Carolina, New Orleans, and New Mexico. 	<p>Substudy 3: Item Calibrations and CAT Simulations. Substudy 4: Empirical Evaluation of the Addiction Severity CAT</p> <ol style="list-style-type: none"> a) Pearson correlation b) Standard error of measurement (SEM) 	
<p>Authors Drymalski, W. M., & Nunley, M. R.</p> <p>Title The use of the addiction severity index psychiatric composite scores to predict psychiatric inpatient admissions</p> <p>Year 2016</p>	<p>Question/Hypothesis Can initial ASI screening predict inpatient mental health service use within 12-months among SUD patients?</p>	<p>Design Retrospective Cohort Study</p>	<p>Sample N = 19,320 patients, 35.01 (SD: 10.72) average age, 28.1% women, 61.9% African Americans, 1.5% Native Americans, 33.3% Caucasians, 3.3% Native Hawaiians/Pacific Islanders, Native Alaskans, Asian Americans, or other.</p> <p>Setting Milwaukee County Behavioral Health Division</p>	<p>Measure ASI psychiatric CS (P-CS)</p> <p>Data Collection Milwaukee County database</p> <p>Analysis</p> <ol style="list-style-type: none"> a) Receiver operating characteristic curve (ROC) analysis b) T-Tests c) Chi-square 	<p>Outcomes The ASI P-CS can be useful to identify patients with mental health needs that are admitted to an addiction treatment program when used as an initial screening measure.</p> <p>Inpatient admissions within 12-months: 343 ROC analysis: a) Curve of .75 (p < .001), good prediction of</p>

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
			(BHD) (June 2005 - December 2012)		<p>hospitalization using the P-CS.</p> <p>0.21 P-CS Cutoff Score:</p> <p>a) 0.80 sensitivity (correctly identify patients who were later hospitalized).</p> <p>b) 0.56 specificity (correctly identify patients who were not later hospitalized).</p> <p>0.27 P-CS Cutoff Score:</p> <p>a) 0.77 sensitivity (correctly identified 264 positive cases).</p> <p>b) 0.61 specificity (better accuracy than the 0.21 cutoff score).</p>
<p><u>Authors</u> Ljungvall, H., Persson, A., Åsenlöf, P., Heilig, M., & Ekselius, L.</p> <p><u>Title</u> Reliability of the addiction severity index self-report form (ASI-SR): A self-administered questionnaire based on the addiction severity index composite score domains</p>	<p><u>Question/Hypothesis</u> Is a self-administered ASI form a reliable alternative to the standard, interviewer-administered ASI to measure drug abuse and problem area severity?</p>	<p><u>Design</u> Research Study (blinded interviewer)</p>	<p><u>Sample</u> N = 59 patients seeking treatment, 66% male, 46.2 years average age, age 18 and older, 75% completed high school or higher, Swedish speaking, 64% employed, and selected before treatment commencement.</p> <p><u>Setting</u> Uppsala University Hospital Addiction Psychiatric Clinic (June 2016 - August 2017).</p>	<p><u>Measure</u></p> <ul style="list-style-type: none"> • ASI Self-Report form (ASI-SR) • ASI Swedish version • Alcohol Use Disorders Identification Test (AUDIT) • Drug Use Disorder Identification Test (DUDIT) <p><u>Data Collection</u> Counterbalanced interviews:</p> <ul style="list-style-type: none"> • ASI interview first: n = 31 	<p><u>Outcomes</u> The ASI-SR is a reliable alternative to the ASI interview to measure drug abuse and problem area severity. No significant differences were found.</p> <p>ICC results:</p> <p>a) ASI</p> <ol style="list-style-type: none"> 1. 6/7 CS domains were good to excellent. <p>b) ASI-SR</p> <ol style="list-style-type: none"> 1. 6/7 CS domains were good to excellent. <p>Internal consistency:</p>

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
<p><u>Year</u> 2020</p>				<p>• ASI-SR first: n = 29 <u>Analysis</u> a) Intraclass correlation analysis (ICC) b) Wilcoxon signed-rank test c) Cronbach's alpha</p>	<p>c) ASI 1. 6/7 CS domains were acceptable. d) ASI-SR 1. 5/7 CS domains were acceptable. Attrition: 15%</p>
<p><u>Authors</u> Mohamed, M., Marican, S., Othman, M., Thurairajasingam, S., & Ali, N.</p> <p><u>Title</u> Validation of addiction severity index (5th edition) Bahasa Melayu version (ASI-5-BM)</p> <p><u>Year</u> 2017</p>	<p><u>Question/Hypothesis</u> How valid/reliable is the ASI on drug treatment and rehabilitation patients?</p>	<p><u>Design</u> Research Study</p>	<p><u>Sample</u> N = 209 recovery center patients, 201 (96.2%) male, 8 (3.8%) woman, 154 (73.3%) Malay, 13 (6.2%) Chinese, 8 (3.8%) Indian, 34 (16.3%) others, 31.11 (8.74 SD) mean age, and 10.4 (1.78 SD) mean education years.</p> <p><u>Setting</u> Drug treatment and rehabilitation centers: 1. 5 addiction treatment centers (174 participants) 2. 1 district rehabilitation center (35 participants)</p>	<p><u>Measure</u> ASI-5 Bahasa Malaysia Version (ASI-5-BM) (50-80 minutes)</p> <p><u>Data Collection</u> National Anti-Drug Agency (AADK)</p> <p><u>Analysis</u> a) Internal and external methods (convergent and concurrent) b) Cronbach's alpha c) Inter-rater analysis Test-retest correlation</p>	<p><u>Outcomes</u> ASI interview findings: Drug use is significantly associated with: 1. Psychiatric morbidities (r=0.207, p<0.01) 2. Family problems (r =0.282, p <0.001) 3. Health/medical problems (r=0.145; p<0.05) Alcohol use is significantly associated with: 1. Legal problems (r=0.215, p<0.01) 2. Health/medical problems (r=0.179, p<0.01) ASI Validity: a) Concurrent validity (>0.92) b) Discriminant validity (>0.92) c) Cronbach's alpha (0.581-0.873) d) Test-retest reliability (0.251-0.946) e) Inter-rater external reliability (0.283-0.7)</p>

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
<p>Authors Ogai, Y., Senoo, E., Gardner, F., Haraguchi, A., Saito, T., Morita, N., & Ikeda, K.</p> <p>Title Association between Experience of Child Abuse and Severity of Drug Addiction Measured by the Addiction Severity Index among Japanese Drug-Dependent Patients</p> <p>Year 2015</p>	<p>Question/Hypothesis Is drug addiction severity influenced by childhood abuse?</p>	<p>Design Research Study</p>	<p>Sample N = 111 drug dependent patients, 77 males, 33 females, 1 unknown gender, 32.9 years average age, age range 18-60 (SD = 9.38).</p> <p>Setting 1. Tokyo Metropolitan Matsuzawa Hospital, Tokyo (56 subjects) 2. Self-Support Services (recovery facility), Tokyo (24 subjects) 3. National Center of Neurology and Psychiatry Musashi Hospital, Kodaira (20 subjects) 4. GAIA (recovery facility), Naha (8 subjects) 5. Fukko-kai Tarumi Hospital, Kobe (3 subjects)</p>	<p>Measure Addiction Severity Index-Japanese version (ASI-J)</p> <p>Data Collection 1-hour ASI interview at one of the 5 setting locations.</p> <p>Analysis Multiple regression analysis</p> <p>Males a) 21 male participants who experienced child abuse (MEA) b) 54 male participants with no child abuse experience (MNEA)</p> <p>Females a) 17 female participants who experienced child abuse (FEA) b) 17 female participants with no child abuse experience (FNEA)</p>	<p>Outcomes Significant influences on drug abuse severity:</p> <p>a) Males 1. MEA had significantly higher drug use severity than MNEA. 2. ASI psychiatric status ($\beta = 0.380$, $p = 0.002$) 3. ASI child abuse ($\beta = 0.245$, $p = 0.023$) 4. Significantly higher emotional problems than MNEA ($t_{44} = 2.43$, $p < 0.05$)</p> <p>b) Females 1. FEA had significantly higher family/social relationship problem severity than FNEA. 2. ASI psychiatric status ($\beta = 0.433$, $p = 0.033$) 3. Child abuse is experienced more in drug-dependent females than their male counterparts.</p>

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
<p>Authors Olsson, M., Öjehagen, A., Brådvik, L., & Håkansson, A.</p> <p>Title Predictors of Psychiatric Hospitalization in Ex-Prisoners with Substance Use Problems: A Data-Linkage Study</p> <p>Year 2015</p>	<p>Question/Hypothesis What variables assessed during the ASI interview are associated with future psychiatric hospitalizations?</p>	<p>Design Cohort Study</p>	<p>Sample N = 4,081 ex-prisoners with substance use disorders.</p> <p>Setting Swedish Prison and Probation Service (2001-2006)</p>	<p>Measure Addiction Severity Index (ASI)</p> <p>Data Collection Swedish National Patient Registry (NPR) and the Swedish population registry.</p> <p>Analysis Cox regression Primary analysis: 1. Patients followed for 4.3 years (average) in the NPR for all-cause psychiatric hospitalizations. Secondary analysis: 1. Patients followed for 5.1 years (average) in NPR for detox hospitalizations/ other addiction treatment services.</p>	<p>Outcomes Predictors of psychiatric hospitalization:</p> <p>Significant ASI psychiatric variables:</p> <ol style="list-style-type: none"> 1. Sedative use (HR = 1.36 [1.20-1.55], P = <.001) 2. Depression (HR = 1.33 [1.02-1.74], P = <.001) 3. Anxiety (HR = 1.33 [1.15-1.55], P = <.001) <p>Primary analysis:</p> <ol style="list-style-type: none"> 1. Sedative use 2. Heroin use (HR = 1.69 [1.48-1.93]) 3. Injection drug use (HR = 1.28 [1.11-1.47]) 4. Previous psychiatric hospitalization (significant) (HR = 1.35 [1.18-1.54], P = <.001) 5. Substances used before incarceration (number) (HR = 1.11 [1.05-1.17]) 6. Homelessness (HR = 1.28 [1.14-1.45]) 7. Anxiety 8. Suicide attempts (HR = 1.37 [1.21-1.55], P = <.001) <p>Secondary analysis: a) Previous depression</p>

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
					b) Previous psychiatric hospitalization (HR = 1.83 [1.46-2.30], P = <.001) c) Previous sedatives use (HR = 1.46 [1.16-1.84], P = <.001) d) Previous anxiety (HR = 1.37 [1.04-1.80], P = <.001) e) Previous suicide attempt (significant) (HR = 1.91 [1.53-2.38], P = <.001)
<p><u>Authors</u> Padyab, M., Armelius, B.-Å., Armelius, K., Nyström, S., Blom, B., Grönlund, A.-S., & Lundgren, L.</p> <p><u>Title</u> Is Clinical Assessment of Addiction Severity of Individuals with Substance Use Disorder, Using the Addiction Severity Index, A Predictor of Future Inpatient Mental Health Hospitalization? A Nine-Year Registry Study</p>	<p><u>Question/Hypothesis</u> Are baseline ASI assessments associated with future mental health disorder (MHD) hospitalizations?</p>	<p><u>Design</u> Retrospective Cohort Study</p>	<p><u>Sample</u> N = 213 substance use disorder patients. Mean age 42 ± 12 years, age 20-75 years, 165 males, 48 females.</p> <p><u>Setting</u> 5 Swedish municipalities (2002-2007).</p>	<p><u>Measure</u> Addiction Severity Index (ASI) composite scores and interviewer severity rating.</p> <p><u>Data Collection</u> Swedish National Patient Register (NPR) and Cause of Death Register (9-years) for MHD hospitalizations: a) Two years before baseline b) At baseline c) 7-years post-baseline</p> <p><u>Analysis</u> a) Stepwise Cox proportional hazards regression model</p>	<p><u>Outcomes</u> Higher mental health and drug use composite scores increased MHD hospitalization risk. Significant predictors of hospitalization: a) MHD hospitalization before baseline. b) ASI composite scores for: 1. Male gender 2. Mental health (0.34 ± 0.23 vs. 0.24 ± 0.19, respectively) 3. Drug use (0.21 ± 0.18 vs. 0.12 ± 0.13, respectively)</p>

References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
<p><u>Year</u> 2018</p>				<p>b) Two-samples Wilcoxon rank-sum (Mann–Whitney) test</p> <p>c) Bivariate analyses:</p> <ol style="list-style-type: none"> 1. T-test 2. Chi-square 	<p>4. Employment (0.86 ± 0.21 vs. 0.71 ± 0.31, respectively)</p> <p>c) ASI interviewer severity rating for:</p> <ol style="list-style-type: none"> 1. Mental health (3.99 ± 2.53 vs. 3.39 ± 2.36, $p = .08$) 2. Drug use (4.10 ± 3.02 vs. 3.34 ± 3.06, $p = .08$)
<p><u>Authors</u> Shah, S., Dematteo, D., Keesler, M., Davis, J., Heilbrun, K., & Festinger, D.</p> <p><u>Title</u> Addiction Severity Index Scores and Urine Drug Screens at Baseline as Predictors of Graduation From Drug Court</p> <p><u>Year</u> 2015</p>	<p><u>Question/Hypothesis</u> Does low severity drug use at the time of drug court entry increase graduation rates?</p>	<p><u>Design</u></p>	<p><u>Sample</u> N = 251 drug court clients. Mean age 24.53, 56 females, 195 males, 89 African Americans, 144 Caucasians, and 18 others.</p> <p><u>Setting</u> Delaware drug courts:</p> <ol style="list-style-type: none"> a) Wilmington urban city (New Castle County). b) Dover State capital (Kent County). c) Georgetown rural community (Sussex County). 	<p><u>Measure</u> Addiction Severity Index (ASI)</p> <p><u>Data Collection</u> Delaware archival database</p> <p><u>Analysis</u> Binary logistic regression and chi-square analysis.</p> <p>Significant predictors of graduation:</p> <ol style="list-style-type: none"> a) ASI drug composite score b) Urine screen c) Race d) Education years 	<p><u>Outcomes</u> Significant predictors of graduation:</p> <ol style="list-style-type: none"> a) Subthreshold ($n = 97$) ASI drug CS compared to mild-to-moderate ($n = 105$) ($p = .032$) and severe ($n = 13$) ($p = 0.008$) groups. b) Baseline negative UA ($n = 92$) for drugs compared to drug-positive ($n = 124$) baseline UA. Significant difference ($p < 0.001$).
<p><u>Authors</u> Thylstrup, B., Bloomfield, K., & Hesse, M.</p> <p><u>Title</u></p>	<p><u>Question/Hypothesis</u> After residential SUD treatment, can the ASI's psychiatric composite score predict psychiatric care and suicide risk?</p>	<p><u>Design</u> Retrospective Cohort Study</p>	<p><u>Sample</u> N = 5825 SUD patients.</p> <ol style="list-style-type: none"> a) Complete ASI b) Age 15-75 years c) Years 2000-2010 <p><u>Setting</u></p>	<p><u>Measure</u> European Addiction Severity Index (EuropASI)</p> <p><u>Data Collection</u></p>	<p><u>Outcomes</u> Higher psychiatric composite scores resulted in higher risks:</p> <ol style="list-style-type: none"> a) Received psychiatric care 1,769 (30.3%)

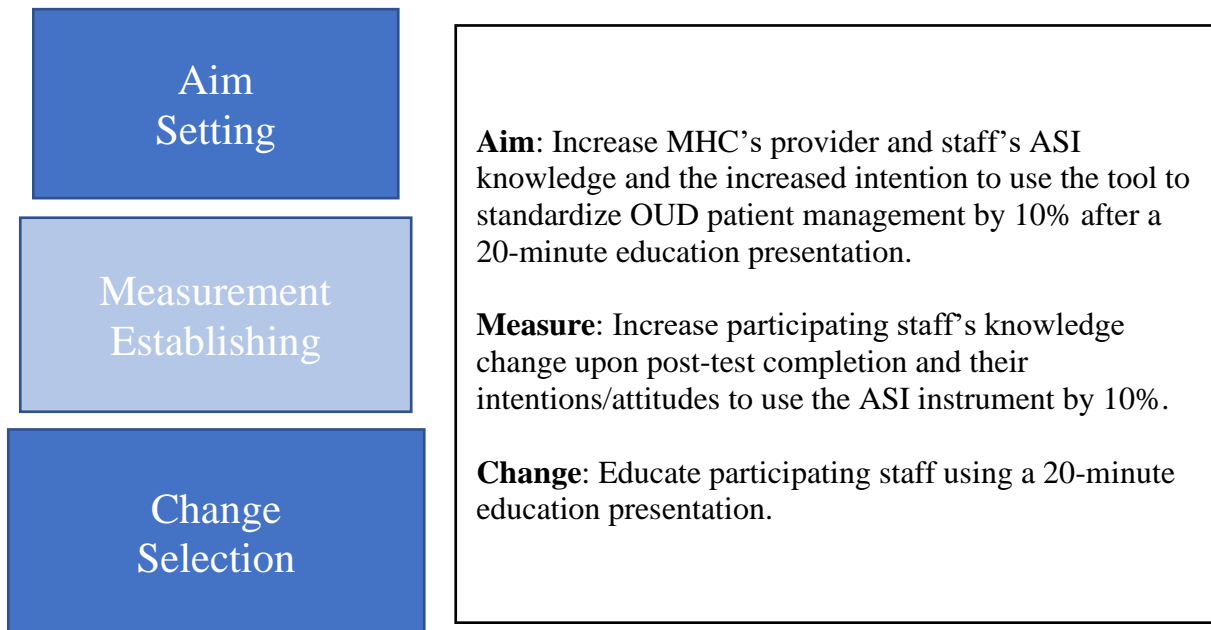
References	Research Question/Hypothesis	Study Design	Sample and Setting	Intervention/Method for Data Collection and Analysis	Findings
<p>Incremental predictive validity of the Addiction Severity Index psychiatric composite score in a consecutive cohort of patients in residential treatment for drug use disorders</p> <p><u>Year</u> 2018</p>			58 Denmark residential treatment centers (2000–2010).	<p>a) Danish National Monitoring and Quality Assurance Database (DanRIS). b) Danish Registry for Causes of Death</p> <p><u>Analysis</u> Descriptive statistics: Competing risks regression analyses for: a) Psychiatric composite score. b) Previous psychiatric care. c) Length of intake. d) Other ASI composite scores.</p>	<p>(subhazard ratio [SHR] = 3.44, $p < 0.001$). b) Committed suicide 27 (0.5%) (SHR = 11.45, $p < 0.001$).</p>

APPENDIX H:

ADDICTION SEVERITY INDEX ASSESSMENT INSTRUMENT [HYPERLINK](#)

https://www.phmcresearch.org/images_specific/PDFlinks/ASI_5th_Ed.pdf

APPENDIX I:
MODEL FOR IMPROVEMENT

**Plan:**

- Purpose:** Increase staff’s knowledge and intention to use the ASI tool.
- Location:** MHC Healthcare Marana Main Health Center.
- Population:** MHC healthcare participating provider and staff (age 18 and older).
- Data Collection:** Staff’s knowledge change and their intention/attitude to use the ASI.

Do:

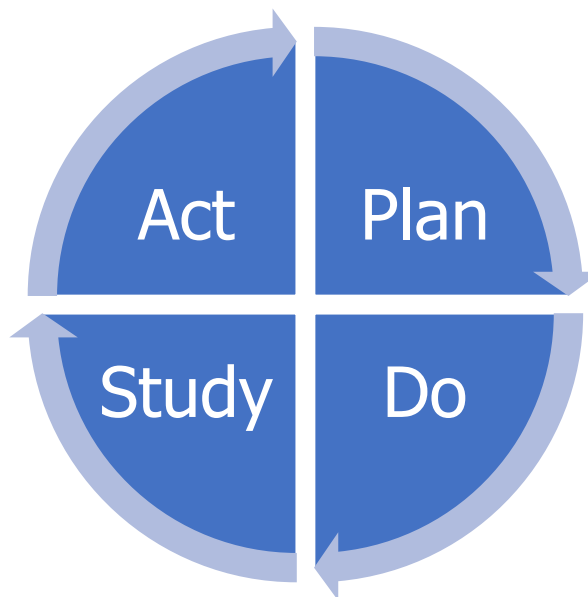
- Intervention:** 20-minute educational presentation and pre-test-post-tests.

Study:

- Pre-/Post-Test:** Objective results will be compared to discern the intervention’s effect on participant’s knowledge.
- Pre-/Post-Likert:** Participant’s intent to change practice (ordinal / bar-chart).
- Measure:** The percentage difference of correct versus incorrect answers between the pre-test and post-test.

Act:

- Refine the change until optimal performance.



APPENDIX J:
EMAIL FROM ALYSSA BELL



Tommie Lee Butler <tommieleebutler@email.arizona.edu>

ASI in Outpatient

Alyssa Bell <albell@phmc.org>
To: Tommie Lee Butler <tommieleebutler@email.arizona.edu>

Fri, Feb 28, 2020 at 3:06 PM

Good afternoon Tommie,

Thank you for reaching out regarding the ASI! As you indicate, there is a great deal of literature on the ASI; but since we've always found it incredibly important to keep the paper-and-pencil version of the ASI in the public domain, I'd say a majority of this research was not performed by our own scientists. If looking for a specific use-case, the best course I can recommend is to continue the literature search for a study that meets your specific needs.

That said, I'm including an article titled *The Addiction Severity Index at 25: Origins, Contributions and Transitions* which is a great reflection on the tool by the original team 25 years after it's release. I'm also including the link to [our page of free resource materials](#) about the ASI; in the "Manuals" drop-down menu you will find documents such as a Frequently Asked Questions, a "Short Guide" to the ASI, as well as an extremely comprehensive, question-by-question manual that covers every item as well as the intent of the items and sections themselves. I think you'll find these documents useful in your research on the use of the ASI.

Finally, as a broad note in response to your inquiry regarding improving patient outcomes, I often like to summarize some of the "philosophy" behind the multiple domains of the ASI and their composite scores. One of the strengths of the ASI, and a reason that it has been used so widely over the last several decades, is that throughout the course of the interview the interviewer is able to gain a high-level view of the client's problem areas. This allows them to create a treatment plan for the client based on all of the areas they indicate a need for additional treatment. The use of the composite scores—which are not meant to identify severity in an initial assessment, but rather to allow the interviewer to measure *change in problem severity between interviews*—allow the interview to assess whether the initial treatment plan is working as desired, or whether there need to be further adjustments made to the treatment plan in order to achieve the optimal outcome.

Please don't hesitate to reach out if you have any further questions, though again, I believe you'll find much useful information in the attached article and resources that I've linked to!

Best,

Alyssa

Alyssa Bell
Product Manager, Research & Evaluation Group
267.773.4348 Office / 215.731.2199 Fax

PUBLIC HEALTH MANAGEMENT CORPORATION

The new home of Treatment Research Institute (TRI)

APPENDIX K:
DNP PROJECT POSTER

Abstract

Purpose: This project aimed to increase provider and staff's addiction severity index (ASI) knowledge and intent to use to treat substance use disorder (SUD) patients.

Background: American SUD prevalence has led to unprecedented public health concerns, crippling treatment expenses, and growing death tolls to create a national crisis.

Methods: Participants were invited by email to take an online pre-test (17-items), ASI training, and post-test (19-items) with demographic, multiple-choice, and Likert questions.

Results: Participant's pre-test to post-test results in ASI knowledge increased by 27.8%, and in intent to use by 14.3%.

Conclusions: ASI training effectively increased participants' ASI knowledge and intent to use.

Purpose

The purpose of this QI project is to increase MHC provider and staff knowledge of the ASI tool and intention to use the instrument to manage SUD patient's care.

Project Question

In the MHC outpatient clinic, will a brief educational presentation about the ASI instrument increase provider and staff knowledge and intent to use in SUD patient's treatment?



(Anke & Lachmann, 2017a)

Background/Significance

- Opioid addiction has impacted public safety to the point of becoming an epidemic.
- As of 2017, prescription opiate addiction affected 1.9 million Americans, 586,000 of which resulted in heroin addiction (Ali et al., 2017).
- 700,000 Americans died from opiate overdose (1999-2017) (Centers for Disease Control and Prevention [CDC], 2018).
- The economic aftermath costs the U.S. \$78.5 billion annually (NIDA, 2019).
- Evidence suggests that more complex opiate users have more complex social and medical demands that necessitates more intensive care (Cushman et al., 2016).
- The ASI addresses both general health and social in its seven domains that researchers identified to be relevant (De Vries et al., 2015; Thystrup et al., 2018).

Methods



(Anke & Lachmann, 2017b)

Design

- One-group, asynchronous, quality improvement quantitative design.

Intervention

- PowerPoint presentation.

Sample

- 6 Marana Health Center (MHC) employees.
- Marana, Arizona, Pima County.

Instruments

- Pre-/post-test survey

Data Collected

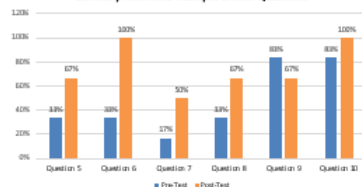
- Demographics, Multiple-choice, & Likert.

Results

Demographics

Gender	6 Female (100%)
Age	21-30 (50%), 41-50 (16.7%), 51-60 (33.3%)
Occupation	3 Recovery Coach (50%), 2 Therapist (33.3%), 1 Nurse Practitioner (16.7%)
SUD Treatment Experience (years)	2 Less than 5 (33.3%), 1 each (16.7%); 0, 5-10, 11-20, More than 20

Correctly Answered Multiple Choice Questions



Sum of Likert Votes

	Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree
Pre-Test 11-17	0	0	2 (2.4%)	24 (28.6%)	56 (19%)
Post-Test 18-17	0	0	0	54 (56.7%)	28 (33.3%)
18-19	0	0	1 (6.3%)	5 (43.7%)	6 (50%)

Discussion/Conclusions

- Cumulative pre-test and post-test scores support that the ASI training intervention was successful.

Provider and staff's ASI knowledge change:

Pre-Test	Post-Test	Change
47.2%	75%	+27.8%

- This 27.8% cumulative positive score exceeded this QI project's goal of a 10% knowledge gain by 17.8%, which is quite reassuring.

Provider and staff's ASI "strongly agree" intent change:

Pre-Test	Post-Test	Change
16	28	+12

- This represents a 14.3% (12-point) stronger provider and staff buy-in for the ASI guided treatment after training.

Interpretation

- Emphasizing the ASI's relative advantage as a better treatment alternative assisted with the innovation's diffusion and reduced pushback (Emani et al., 2018; Rogers, 1983; 2002).

Conclusion

The quality improvement project findings support that interventional training effectively increased participants' ASI knowledge and intent to use.

Sustainability

- Plans to evaluate the ASI at MHC and additional training.

Dissemination

- Two poster presentations: one to college and MHC.

Author Contact Information

Phone: (623) 565-0709

Email: tommieleebutler@email.arizona.edu

Reference



(Anke & Lachmann, 2015c)

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