HEALTH, WELLNESS, AND QUALITY OF LIFE SATISFACTION AMONG PERSONS RECEIVING MEDICATION-ASSISTED TREATMENT

BY

RHONDA G. PATRICK

B.S.W., Southwest Texas State University, 1995
M.S.W., University of Houston, 1996
M.P.A., University of Houston, 2001

DISSERTATION

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DISSERTATION SIGNATURE PAGE

WE HEREBY RECOMMEND THAT THE DISSERTATION BY

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BE ACCEPTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF Ph.D. IN SOCIAL WORK.

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Abstract

Purpose

This study explores the health, wellness, and quality of life (QoL) of opiate-dependent individuals who are receiving medication-assisted treatment for opioid use disorder. The study assesses longitudinal improvement of QoL and the influence of demographic, psychosocial, drug, and health-related variables on individuals' QoL.

Methods

This is a quantitative longitudinal study of adult patients enrolled in two outpatient opioid treatment programs (OTP) located in Texas. The patients were receiving medication-assisted treatment for opioid use disorder. The study includes analysis of patient psychosocial and demographic information collected at the time of the patient's initial enrollment in the program and analysis of QoL assessments collected from patients annually in 2013, 2015, 2016, and 2017.

Results

Although there were some small long-term changes in the six dimensions of the patients' QoL, these changes appeared to have limited practical or clinical significance. Several psychosocial stressors, including anxiety, alcohol use, non-prescribed opioid use, being physically abused as a child, and childhood exposure to substance use had statistically significant effects on patient QoL, however, these effects appeared to have limited practical or clinical significance.

Conclusions

Ultimately, this study has revealed that individuals receiving medication-assisted treatment (MAT) for opioid use disorder need psychosocial supports throughout the entirety of their treatment, regardless of the length of the episode. A satisfactory QoL is mediated by psychological well-being. Consequently, a more holistic approach to MAT is recommended,

which goes beyond pharmaceutical maintenance and medical care to include special attention for psychological complaints and trauma.

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Introduction

An estimated 21 million people over the age of 12 have been classified as having a substance use disorder (SUD). Yet experts estimate that the majority of those in need of treatment do not receive any care (Substance Abuse and Mental Health Services Administration [SAMHSA], 2017). These disorders often result in serious harm to the health of the individuals and enormous financial and social consequences that go beyond the health care system—including the loss of economic productivity due to withdrawal from the workforce and increased rates of crime, disability, and death (Mark, Levit, Vandivort-Warren, Buck, & Coffey, 2011; Meyer, Patel, Rattana, Quock, & Mody 2014). According to the National Institute on Drug Abuse (National Institute on Drug Abuse [NIDA], 2012a), the combined direct and indirect costs of SUDs reach into the hundreds of billions of dollars annually, leading some to believe that the SUD issue is the biggest health crisis to face America in decades (Birnbaum, White, Schiller, Waldman, Cleveland, & Roland, 2011; Rosenberg, 2014). Alcohol and illicit drug abuse is ubiquitous in our society, and its toll is grave: the deaths of celebrities, youth, and everyday people are fueling a public health frenzy. Increased media attention to SUDs and grave consequences is fueling the exorbitant allocation of public and private dollars to the SUD treatment industry (Pew Research Center, 2015; Munro, 2015), begging many health advocates, public policymakers, and funders to ask, “What are we getting for our money?” (Enos, 2015). Regardless of whether one believes this to be a scientific fact or simply media propaganda, the latest and most comprehensive global market analysis on industry expenditures (2008) reports that SUD treatment is a $35 billion industry (Marketdata Enterprises, Inc., 2014). More than $24 billion of that is disbursed to 14,000 stand-alone treatment centers (SAMSHA, 2014), where an estimated 2.3 million Americans received a variety of treatments to address their SUD,

(SAMHSA, 2016). The majority—69%—of the estimated $24 billion price tag is paid by American taxpayers, coming from public funds such as Medicaid, Medicare, and federal block grants (Pew Research Center, 2015).

Dependence on opioids, particularly heroin and prescription pain relievers, has increased significantly in the United States over the last decade (Center for Behavioral Health Statistics and Quality [CBHSQ], 2016; Maxwell, 2015). Between 2002 and 2015, the number of individuals considered to have an opioid use disorder grew 41% from approximately 1.7 million to 2.6 million people (SAMHSA, 2016; CBHSQ, 2016). As opioid use disorders have increased, so has the utilization of substance use treatment services. Between 2002 and 2012, the proportion of admission to substance use treatment programs for individuals reporting opioid use increased from 18% to 26% (SAMHSA, 2014).

Heroin and nonmedical use of prescription opioids remains significant, and recent trend data indicate that it is increasing in the United States (CBHSQ, 2016; Maxwell, 2015). Between 2007 and 2015, there was a consistent increase in both heroin use and nonmedical use of prescription pain medications (within the past year) among persons 12 years or older (SAMHSA, 2016; CBHSQ, 2016). Evidence suggests that the concurrent increase in heroin use and nonmedical prescription opioid use is the result of two factors: changes to the formulation of prescription opioids that made it more difficult to crush, and, therefore, to inject and/or inhale prescription opioids, and the transition from nonmedical prescription opioid use to heroin use among prescription opioid dependent individuals (Pollini, Banta-Green, Cuevas-Mota, Metzner, Teshale, & Garfein, 2011; Maxwell, 2015). Similar to prescription opioids, heroin dependence has significant health consequences, including HIV and hepatitis C infection, drug overdose, injection drug use, bacterial and soft tissue infections such as endocarditis and cellulitis, as well

as unsafe sex and drug behaviors (Compton, Jones, & Baldwin, 2016; Neaigus, Miller, Friedman, Hagen, Sifaneck, Ildefonso, & des Jarlais, 2001; Ouellet, Wiebel, & Jimenez, 1995).

Opioid use disorder, whether the result of prescription opioid or heroin use, carries a significant monetary cost (Barnett & Hui, 2000; Connock, Juarez-Garcia, Jowett, Frew, Liu, Taylor, Fry-Smith, Day, Lintzeris, Roberts, Burls, & Taylor, 2007). Health care costs associated with opioid use disorder are considerable, at approximately $25 billion, and the overall societal costs due to opioid use disorder, including health care costs, incarceration and workplace costs such as lost employment, are estimated at $55.7 billion (Birnbaum et al., 2011; Florence, Zhou, Luo, & Xu, 2016).

Treatment of Opioid Use Disorders

Broadly speaking, there are two types of treatment for opioid use disorders: (1) drug-free inpatient/outpatient, which includes short-term detoxification, inpatient hospitalization, and rehabilitation programs, as well as outpatient programs; and, (2) medication-assisted treatment (MAT), which includes methadone and buprenorphine. MAT is the most effective form of substance use treatment for opioid use disorders (Mattick, Kimber, Breen, & Davoli, 2014; Mattick, Breen, Kimber, & Davoli, 2009). Despite evidence supporting MAT as the most effective form of treatment for opioid use disorder, only 28% of individuals with an opioid use disorder were enrolled in a medication-assisted treatment program in 2014 (SAMHSA, 2014).

Medication-Assisted Treatment

Opioids stimulate feelings of euphoria, drowsiness, and decreased anxiety by binding to and activating opioid receptors in the body (Jaffe, 1992). Medications used to treat opioid use disorders are classified by their effect on these receptors. Opioid agonists, such as heroin, codeine, and methadone, bind to and activate these receptors, allowing users to experience

feelings of euphoria (Dole & Nyswander, 1966; Jaffe, 1992). Opioid antagonists such as naloxone also bind to these receptors, but they block the euphoric effects of these drugs and have the potential to reverse the effects altogether (Greenstein, Fudala, & O'Brien, 1997). Naloxone, for example, is used to reverse opioid overdoses by removing opioid agonists from these receptor sites, effectively putting the patient in a state of withdrawal. Finally, between the categories of agonists and antagonists are partial agonists, and partial antagonists, such as buprenorphine. Partial opioid agonists/antagonists bind to opioid receptors, providing some agonist effects, but these effects are limited by the antagonist properties. (Greenstein et al., 1997).

Methadone and buprenorphine are particularly effective at suppressing withdrawal symptoms—usually up to 36 hours—due to their agonist properties, while simultaneously creating blocking effects for other opioids, such as heroin (Lowinson, Marion, Joseph, & Dole, 1992). These medications create a tolerance to opioids which, over time, lessens the effect of other opioids (Walsh & Eissenberg, 2003). This quality is an important benefit for the treatment of opioid use disorders because it can reduce the likelihood of sustained or increased use of other opioids.

Methadone and buprenorphine have long half-lives, or lasting effects, making them ideal for the treatment of opioid use disorders (Lowinson et al., 1992). Heroin has a half-life of approximately two to three hours, at which point opioid receptors begin to empty and the user begins to feel symptoms of withdrawal (Dole & Nyswander, 1966; Arif & Westermeyer, 1990). In contrast, the half-life of methadone ranges from 16–48 hours and approximately 24 hours for buprenorphine (Kreek, Borg, Ducat, & Ray, 2010). The extended half-lives of these medications make them particularly effective at reducing cravings by staving off withdrawal symptoms between doses. For most patients, a once-daily oral dose prevents opioid withdrawal symptoms,

which are a strong driver for ongoing illicit opioid use (Saxon, Hser, Woody, & Ling, 2013). Both methadone and buprenorphine can be used in detoxification and maintenance treatment (Center for Substance Abuse Treatment [CSAT], 2005). MAT, as compared with inpatient detoxification, has been shown to retain patients for longer durations and is associated with significantly less heroin use than individuals utilizing inpatient detoxification (Mattick et al., 2009). Additionally, MAT has been associated with reductions in HIV incidence, mortality, injection drug use, syringe sharing, and slower progression of HIV disease, and is safe for treating opioid use disorder in pregnant women (American College of Obstetrics and Gynecologists, 2012; Bukten, Skurtveit, Gossop, Waal, Stangeland, Havnes, & Clausen, 2012; Jones, Arria, Baewert, Heil, Kaltenbach, Martin, & Fischer, 2012; Grönbladh, Ohlund, & Gunne, 1990; Avants, Margolin, Sindelar, Rounsaville, Schottenfeld, Stine, Cooney, Rosenheck, Li, & Kosten, 1999; Kandall, Doberczak, Jantunen, & Stein, 1999). Buprenorphine, while not as effective as methadone overall, is more effective at retaining heroin users in treatment than those receiving a placebo (Mattick et al., 2014; Whelan & Remski, 2012).

Methadone Provision and Utilization

In the United States, methadone is administered through opioid treatment programs (OTPs) that are certified and regulated by SAMHSA. OTP regulations are strict, particularly regarding the frequency of methadone dosing, requiring most patients to report to the clinic for dosing five to six days per week. This highly regulated environment is considered, by some, to be stigmatizing and a barrier to recovery (Anstice, Strike, & Brands, 2009; Harris & McElrath, 2012).

Given the restrictive nature of methadone provision in the United States, the approval of buprenorphine for the treatment of opioid use disorder in office-based settings was ground-

breaking. In 2000, President Bill Clinton signed the Drug Addiction Treatment Act of 2000 (DATA-2000), a bill that allowed for the expansion of MATs to outpatient settings beyond methadone maintenance treatment programs. Two years later, buprenorphine was approved by the Food and Drug Administration for the treatment of opioid use disorder. In addition to office-based settings, buprenorphine can also be provided at OTP clinics and community-based treatment programs by qualified physicians (Ducharme & Abraham, 2008). Evidence suggests that buprenorphine users are demographically different than methadone users and include individuals residing in rural areas and users of prescription opioids, two factors that might help to expand the reach of MAT (Stein, 2011). Both the provision of MAT by treatment programs and providers and the utilization of MAT by individuals with opioid use disorder is limited in the United States (Stein, 2011; Knudsen, Abraham, & Oser, 2011). In 2015, 29% of all substance use treatment facilities in the United States provided MAT, and OTP specific programs served approximately 12% of all individuals attending substance use treatment (SAMHSA, 2017).

Motivation for Seeking Treatment

Individuals with SUDs seek treatment for a variety of reasons. The majority find their way to treatment at the urging or demands of others, and many are in a state of emotional distress when they arrive, desperate to have relief from the consequences and problems that they, and others, believe to be the result of their SUD. Most are expecting a cure and the immediate cessation of their distress (Graham & Gillis, 1999; Melnick, Hawke, & De Leon, 2014). Unfortunately, whether any of those expectations are achieved or not is a source of great debate and discussion in the health care industry. On one side of the debate, health care researchers report that people are successfully treated and recover from SUDs (Laudet, 2011). On the other side of the debate, investigative reports and documentaries, such as National Geographic's series

Drugs, Inc. (2010–2016), PBS's Frontline Episode *Chasing Heroin* (2016), and Adam Finberg's documentary *The Business of Recovery* (2015) point out an extremely flawed and profiteering industry that lacks documentation of clinically significant long-term benefits of treatment (Fletcher, 2013; Glaser, 2015; Horvath & Finberg, 2015; Munro, 2015; Sederer, 2015). Both arguments have validity; however, the evidence that supports both assertions are based on anecdotal evidence and personal testimonials. The questions around the accuracy of these claims, as well as questions about the "if" and "how" of treatment effectiveness relate to industry practices.

Treatment Efficacy and the Dominant Model Evaluating Treatment Outcomes

Modern media (talk shows, reality television, and web-based media) and advances in scientific understanding of SUDs and the treatment of SUDs have resulted in a mixture of praise and condemnation of the patient and the treatment provider. A significant critique of the treatment industry may be attributed to the very simple rehabilitation-oriented model of treatment that is the basis for most treatment programs (Fletcher, 2013; Munro, 2015). Despite significant differences among individual treatment practitioners as to whether they conceptualize SUDs as a disease, a bad habit, or a sin (Musto, 1999; Volkow & Morales, 2015; White, 1999), virtually all therapeutic perspectives have assumed that some finite amount, duration, or intensity of therapies, medications, and services should be adequate to move a patient towards sobriety and abstinence of substance use (NIDA, 2012a, 2016; National Center on Addiction and Substance Abuse [CASA], 2012). The explicit expectation of the person receiving treatment, as well as society at large, has been that once the patient had been successfully treated, she or he would be ready for discharge and be expected to remain abstinent from any substance use for a substantial period of time—at least 6–12 months (CASA, 2012). Despite the increase in

treatment efficacy research over the past 20 years and articulating a need to utilize scientifically proven interventions, the industry continues to deploy group-based, psychoeducational, residential, and outpatient programs that rely heavily on the Alcoholics Anonymous Twelve Steps facilitation approach (Brown & Flynn, 2015). As such, the outcome data hasn't changed much; about 50–60% of individuals relapse within 6 months following treatment cessation (Brown & Flynn, 2015; Sederer, 2015). This is true regardless of the treatment modality, reasons for discharge, patient characteristics, or the particular substance(s) of abuse (Anglin, Hser, & Grella, 1998; Finney & Monahan, 1996; Hubbard, Craddock, & Anderson, 2003; Hubbard, Marsden, Rachel & Harwood, 1990; Hunt, Barnett, & Branch, 1971; Hser, Hoffman, Grella, & Anglin, 2001; Institute of Medicine, 1990; McKay & Hiller-Sturmhöfel, 2005; Schildhaus, 2015; Simpson, 1997). Treatment outcome research tends to have narrow study aims and small sample sizes, and for this reason, the information that industry professionals have about treatment efficacy and relapse should be tempered with the fact that the last national study on the effectiveness of typical and contemporary treatment programs was conducted more than 20 years ago (Brown & Flynn, 2015). As such, these fragmented treatment efficacy studies conducted in the last 20 years have not significantly added to the field in terms of patient outcomes (Brown & Flynn, 2015). This lack of information has pushed SAMHSA to call for more scientifically rigorous studies that guide the industry towards evidence-based models of treatment based on proven, effective therapeutic interventions that help to understand and address possible causes of SUDs and improve the individual's quality of life (hereafter referred to as *QoL*), while at the same time incorporate "recovery-oriented" principles into the current model of treatment (Schildhaus, 2015). Unfortunately, this call has gone mostly unanswered (Sederer, 2015). CASA (2012) points out that despite scientific evidence that 12-step programs are not effective for

many patients, treatment programs continue to base their core intervention on the Alcoholics Anonymous Twelve Steps approach. Moreover, scientists still struggle with the possible causes of SUD (CASA, 2012), complicating what qualifies as a best treatment for SUD. In addition, monetary incentives of the treatment industry have encouraged efficacy studies to continue to use posttreatment abstinence as the standard for which programs and patient outcomes are determined to be effective (Brown & Flynn, 2015). Importantly, Nora Volkow, director at NIDA, continues to encourage the use of abstinence as the most important measure of treatment efficacy (Volkow & Morales, 2015). She justified her stance in her 2014 TedMed talk "Why Do Our Brains Get Addicted?" about the rewards of an abstinence view: "As individuals experience abstinence, they can receive the rewards of living an abstinent, addiction-free lifestyle." As the director of the lead federal research agency that sets policy for SUD treatment and drives the research agendas of the industry, her continued stance that abstinence is the gold standard for measurements has resulted in this being the only measurement of treatment effectiveness in most programs.

However, using abstinence as the only measure of treatment effectiveness is flawed (Tiffany, Friedman, Greenfield, Hasin, & Jackson, 2012). While abstinence is the intended goal for funders of treatment, it might not be the primary goal of all patients (Laudet & White, 2008). While recovery implies long-term abstinence from the use of alcohol and other drugs, abstinence is not necessarily a primary objective of all persons entering SUD treatment. Some set a treatment goal of cutting down on alcohol or other drug use to a so-called "responsible" or "safe" level. For many patients, recovery also includes healthy living, wellness, and productive engagement. Therefore, improved QoL, regardless of achieving sustained abstinence, should be incorporated into the expected goals of treatment for SUDs. There is a popular perception that

treatment “fixes” will help persons with SUDs in such a way that they will stop using substances and become productive, healthy, law abiding citizens (Bader, 2015; Fletcher, 2013). This perception fails to recognize the chronicity of the disorder (U.S. Department of Health and Human Services [HHS], 2016). This perception has important public health policy implications because it limits the way that outcomes of treatment are defined and measured, and it encourages acceptance of limited outcomes.

The sole focus on abstinence is understandable and likely reflects the expectations of key stakeholders (funders and the public) who are most likely to assess the effectiveness of treatment in terms of SUDs and related threats to public health and safety. But, addressing only these symptoms will not serve either the patients themselves or other stakeholders. Rather, several recent publications suggest that fostering opportunities for improved functioning and satisfaction in key areas such as psychosocial, education, work, physical and mental health, drug-free leisure activities, and living context, in addition to reducing substance use, might significantly enhance the likelihood of sustained remission and thus constitute the best investment of taxpayer dollars in the long run (Donovan, Mattson, Cisler, Longabaugh, & Zweben, 2005; Gossop, Stewart, Browne, & Marsden, 2002). This is consistent with recommendations recently made by McLellan, McKay, Forman, Cacciola, & Kemp (2005) who wrote, “Typically, the immediate goal of reducing alcohol and drug use is necessary but rarely sufficient for the achievement of the longer-term goals of improved personal health and social function and reduced threats to public health and safety—i.e., recovery” (p. 448). The goal of clinical practice is to improve patients’ lives. On a broader level, these recommendations suggest that the SUDs field needs to make a paradigmatic shift from the traditional pathology-focused model of evaluating interventions by assessing disease-specific outcomes, to one that incorporates or is complemented by outcomes

emphasizing positive functioning and the cumulative improvement in one's overall QoL (Laudet, Morgen, & White, 2006).

Motives for Entering Treatment

Individuals with SUDs are motivated to seek treatment for a variety of reasons and often seek help to arrest problematic alcohol and illicit drug use, not as an end but rather to escape the negative consequences and to gain a better life (Laudet, 2011). While most treatment programs focus on promoting *only* abstinence, the individuals seeking treatment aim for varying degrees of abstinence *and* to improve their overall QoL (Laudet, 2011). This second goal for the patient is often what is missing from their treatment. The pathway for many individuals seeking treatment often begins as a result of duress, often prompted by legal mandates from the criminal justice system, formal mandates from employers and social assistance agencies, and informal mandates, such as threats, ultimatums, and interventions issued by family and friends (Gerdner & Holmberg, 2000; Joe, Simpson, & Broome, 1999; Polcin & Weisner, 1999; Rush & Wild, 2003). Fortunately, most individuals with SUDs do not perceive pressure as negative, but rather as necessary in helping them to recognize the need for help with a serious problem (Korcha, Polcin, Greenfield, Bond, & Kerr, 2014). Many persons entering treatment report that the fear of not being able to care for themselves or significant others, the fear of incarceration, and the loss of significant intimate relationships or social networks are significant motivators for entering treatment (Korcha et al., 2014).

Regardless of their reasons, it appears that persons entering treatment have a similar goal, which is to cut their substance use to the point of reducing or alleviating the negative stressors that have motivated them into treatment in the first place (Fletcher, 2013; Janes, 2010). For many persons with SUDs, their state of emotional distress has become so unbearable that they are

willing to try almost anything to relieve the distress (Fletcher, 2013; Strain & Stilzer, 2005). Most do not necessarily care *how* they quit feeling so miserable and distressed; they only know it is possible. And there is a constant flow of recovery information from people they know who have struggled with an SUD and from propaganda in the media and from current treatment center employees (White, 2011) that leads them to believe that treatment will, in fact, transform their lives for the better (Brauer, 2017; Fletcher, 2013).

Quality of Life and New Intervention Models

The idea of QoL as a desired long-term intervention outcome has assumed increased importance in clinical practice and research (Bowling & Brazier, 1995; Carr & Higginson, 2001; Hyland, 1998; Muller, Skurtveit & Clausen, 2016). Most areas of health research have made a gradual shift from the traditional disease-focused model of evaluating treatments by assessing symptom-specific results, to one that incorporates or is complemented by results emphasizing QoL. Many healthcare related clinical trials now routinely include QoL measures as primary or secondary outcomes (Bonomi, Patrick, Bushnell, & Martin, 2000; Foster, Powell, Marshall, & Peters, 1999). QoL is an important diagnostic and outcome criterion that incorporates the individual's subjective view and illuminate's domains not captured by traditional symptom measures (Bonomi et al., 2000; Donovan et al., 2005; Laudet, 2011).

In 1998, the World Health Organization (WHO) defined health as a state of complete physical, mental, and social well-being (World Health Organization, 2017). However, Gill and Feinstein (1994) proposed that QoL reflects the individuals' perceptions and reactions not only in relation to their mental and physical health, but also to non-health-related areas, including family, friends, and work (p. 625). A broader definition by early pioneers in QoL measurement also included characteristics such as life satisfaction, accomplishment in social and professional

roles, a perception of being industrious, a feeling of control over one's destiny, as well as a meaningful existence and spiritual fulfillment (Diener & Suh, 1997; Schalock, 2005). The Centers for Disease (CDC), incorporates wellbeing into health-related quality of life (HRQoL). What people think and feel about their lives, such as the quality of their relationships, their positive emotions and resilience, the realization of their potential, or their overall satisfaction with life are all elements of wellbeing. And, well-being generally includes global judgments of life satisfaction and feelings ranging from depression to joy. The CDC has made a commitment to include HRQoL and wellbeing into population health monitoring (Centers for Disease Control [CDC], 2016).

Many other federal agencies have taken steps to expand treatment efficiency measures. In 2009, a panel of substance abuse treatment and research experts was convened by NIDA to discuss appropriate outcome measures for clinical trials of substance abuse treatments. One of the subgroups formed for that meeting was charged with formulating recommendations for assessments of treatment outcomes beyond the conventional drug-use measures used in treatment studies. The panel recommended the inclusion of QoL in measuring treatment efficacy, especially because the expected impact of addiction treatment is not just the cessation of substance use, but reduction in the individual, familial, and community costs associated with addiction (Tiffany et al., 2012). In the panel's report to NIDA, Tiffany and his colleagues wrote, "It is the consequences of substance use for the individual, significant others, and society, rather than the actual behaviors that are the basis of concerns, and the choice of treatment outcomes should reflect this reality" (p. 713). Despite the recommendations of this work group, no real change occurred in outcome measurement or practice. In an effort to continue momentum to change how addition is measured and then translated into practice, the Director of the NIDA,

Nora D. Volkow, M.D., established the National Advisory Council on Drug Abuse's "Workgroup on Adoption of NIDA's Evidence-Based Treatments in Real World Settings" in November of 2011. The group was charged by Dr. Volkow to determine how effectively the treatment interventions developed, tested, and evaluated through NIDA's extramural programs were being transferred and utilized in real world settings to explore barriers for moving from research findings to adoption as standard practice and to consider whether and how the organization of NIDA could be best structured to meet these evolving scientific goals. This group concluded that there is a need to include treatment outcomes besides just substance use and abstinence in measuring the effectiveness of treatment as a whole (NIDA, 2012b).

The push from NIDA as well as the treatment outcomes panel opened a dialogue around the importance of QoL for persons with a SUD and, as a result of that work, QoL is becoming an important clinical and research outcome (Laudet, 2011). Despite the increasingly prominent discussion and application of QoL as an outcome measure in addiction research, what is lacking is a specific conceptual framework for understanding the relationship between QoL and the individual's SUD treatment and recovery experience.

A Conceptual Framework for Holistic Treatment of Substance Use Disorders

To measure treatment efficacy from a more holistic perspective that is consistent with the person-in-environment perspective of the social work profession and to build an articulate conceptual framework for understanding and measuring treatment efficacy, it is essential to define recovery from the patient perspective and then link to the concepts of QoL (De Maeyer, Vanderplasschen, & Broekhaert, 2009).

Although most treatment providers continue to measure recovery in terms of abstinence, in recent years, the concept of recovery has come to be defined more broadly than it was in the

past. For example, the Betty Ford Institute Consensus Panel Report (2007) defined *recovery* as "a voluntarily maintained lifestyle characterized by sobriety, personal health, and citizenship" (p. 222). The panel went on to say, "recovery is recognized universally as being multidimensional, involving more than simply the elimination of substance use" (p. 222). Similarly, in 2005, SAMHSA offered the following working definition of *recovery*: "Recovery from alcohol and drug problems is a process of change through which an individual achieves abstinence and improved health, wellness and quality of life" (CSAT, 2005, p. 5; Sheedy and Whitter, 2009). SAMSHA's position on recovery is that "recovery is a process of change whereby individuals work to improve their own health and wellness and to live a meaningful life in a community of their choice while striving to achieve their full potential" (CSAT, 2005, p. 6). These definitions involve well-being and QoL, some measure of community engagement or citizenship, and some measure of sobriety. What is clear from these definitions is that the essence of recovery is a lived experience of improved life quality and not simply abstinence. Thus, it is important the recovery be viewed as a process rather than an end state, with the goal being an ongoing quest for a better life.

How individuals experience recovery from an SUD is also riddled with descriptions from a multitude of professional, scientific, and personal experiences. A basic Google search posing the question "How do people recover from a substance use disorder?" yielded 59 million responses. Most research intended to identify the predictors of recovery has focused on factors associated with substance using behaviors, particularly abstinence. Although treatment of SUDs might be effective at promoting reductions in alcohol and drug use and improvements in related functioning (Brown & Flynn, 2015; Magura, Laudet, Kang, & Whitney, 1999; Mojtabai & Zivin, 2003; Simpson, 1997), most treatment lasts a relatively short period of time, even when

individuals complete the planned duration of services (Gerstein & Harwood, 1990; Gossop et al., 2002; Hser, 1988). However, treatment gains tend to be short-lived and posttreatment reoccurrence of the SUD is high, often occurring within a short time after services end (Gossop et al., 2002; Laudet, Stanick, & Sands, 2007). It is, therefore, important to identify nontreatment dynamics that promote the maintenance of treatment gains.

QoL, while becoming more prevalent in the research literature, remains an emerging research field, with no universally accepted definition in research circles (Bonomi et al., 2000; Smith, Hughes, & Budd, 1999). There is, however, a broad consensus that QoL is subjective—it cannot be observed by others (Bonomi et al., 2000). It is related to, but broader than, perceived health status (Patrick & Erickson, 1993; Schalock, 2005), and it is multidimensional—it captures a range of clinical, functional, and personal influences (Allison, Locker, & Feine, 1997; Bonomi et al., 2000). Clinicians, researchers, and federal agencies (National Institutes of Health (NIH), Patient-Reported Outcomes Measurement Information System (PROMIS), HHS, and the Food and Drug Administration (FDA) unanimously regard four domains (dimensions) as key components of QoL. These domains are physical health, psychological health, social relationships, and the environment (Testa & Simonson, 1996). Historically, the conceptualization of QoL mirrored the pathology-based clinical care model and was centered on subjective perceptions of the impact of health status. This included limitations in physical, psychological, and social functioning and well-being, a concept referred to as health-related QoL. However, in the last decade, corresponding with the reconceptualization of health as a positive resource rather than the mere absence of symptoms (Valderas, Kotzeva, Espallargues, Guyatt, Ferrans, Haylard, & Alonso, 2008), “the goal (of treatment) is longevity with good function, and the challenge to health professionals is not only preventing disease and overcoming it when it occurs, but also

helping people to achieve that goal" (Breslow, 2006, p. 17). A broader conceptualization of QoL has developed, exemplified by WHO's definition of QoL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (World Health Organization, 2017). This generic or overall conceptualization of QoL encompasses both life satisfaction in general and satisfaction with specific life domains. In addition to shifting the focus from limitations in functioning to wellness, overall QoL is also conceptualized more broadly than health-related QoL, extending the scope from the three traditional dimensions (social, psychological, and physical health) to factors such as environmental safety and the opportunity for recreation and leisure (i.e., living context). It is important and of predictive value for clinicians to know how satisfied people are with important aspects of their life, social relations, health, and living context, and measures of disease alone are insufficient (Bonomi et al., 2000; Cummins, Lau, & Stokes, 2004).

Many studies that have evaluated treatment programs have focused on relapse, overdose, and drug use consumption as variables associated with positive changes among patients (McLellan, 2002). However, in recent years, there has been an increased interest in looking at changes in overall QoL, which include aspects of physical, social, psychological, and environmental health (Donovan et al., 2005; Laudet, 2011; Tiffany et al., 2012). SUDs are complex, chronic conditions involving physical, psychological, social, and environmental dimensions (McLellan, Lewis, O'Brien, & Kleber, 2000), and it is important to understand how these different dimensions are improved among individuals in treatment over time and how they contribute to abstinence and lowered rates of drug use and improved QoL (Donovan et al., 2005; Laudet, 2011).

Four Domains of Quality of Life

Physical Health. The QoL domain of physical health includes energy, mobility, pain, discomfort, sleep, ability to work, and medical illness. People who suffer from SUDs often have one or more accompanying medical issues, which might include lung or cardiovascular disease, stroke, cancer, and other acute and chronic medical conditions (National Center on Addiction and Substance Abuse at Columbia University [CASA], 2012). Much QoL research (Brown, Renwick, & Nagler, 1996; De Maeyer, Vanderplasschen, & Broekaert, 2010; Rapley, 2003) has shown that feelings about personal health spill over into overall life satisfaction because personal health is considered important in one's evaluation of life (Diener & Suh, 1997; Rapley, 2003; Schalock & Verdugo, 2002). In his review of empirical research related to health and wellbeing, Seligman (2008) found that a person reports a positive view of life when he or she feels *great,* which is defined by (a) a sense of positive physical well-being and a sense of energy, vigor, vitality, robustness (as opposed to a sense of vulnerability to disease, tenuousness of health status, and health-related anxiety); (b) the absence of bothersome symptoms; (c) a sense of durability, hardiness, and confidence about one's body as opposed to a sense of fragility and susceptibility to disease; and (d) an internal health-related locus of control so that the individual feels a measure of control over health. Seligman, as well as others, concluded that health is more than the absence of disease; it is a resource that allows people to realize their aspirations, satisfy their needs, and to cope with the environment to live a long, productive, and fruitful life (Breslow, 2006). In this sense, health enables social, economic, and personal development that are fundamental to well-being (Diener & Suh 1997). Health promotion is the process of enabling people to increase control over and to improve their health (Brown, Renwick, & Nagler, 1996). Individual resources for health can include physical activity, healthful diet, social ties, resiliency,

positive emotions, and autonomy. Health promotion activities aimed at strengthening such individual, environmental, and social resources may ultimately improve well-being (Brown, Renwick, & Nagler, 1996).

Psychological Health. The QoL domain of psychological health includes negative feelings, positive feelings, self-esteem, personal beliefs, and cognitive functioning. Psychological health is important with respect to how we function and adapt, and with respect to whether our lives are satisfying and productive. Finding a distinct definition of psychological health is challenging. However, Seligman (2008) expands his explanation of what influences QoL to include psychological necessities such as optimism and confidence about one's future, life satisfaction, positive emotion, minimal and appropriate negative emotion, and a high sense of engagement and meaning (p. 8). Adler and Seligman (2016) discuss the importance of psychological health as the human need to "flourish." They posit that "flourishing is simultaneously the absence of the crippling elements of the human experience—depression, anxiety, anger, fear—and the presence of enabling ones—positive emotions, meaning healthy relationships, environmental mastery, engagement, and self-actualization" (p. 4).

Social Relationships. The QoL domain of social relationships includes personal relationships, social support, and sexual activity. The density of an individual's social relationships, the degree to which he or she interacts with others and how much he or she receives and gives affect, instrumental support, and/or services are all associated with health indicators, subjective well-being, and QoL measures (Fernández-Ballesteros, Díez-Nicolás, Caprara, Barbaranelli, & Bandura, 2002). One of the most striking characteristics of humans is our sociality. Social relationships pervade every aspect of human life, and these relationships are

far more extensive, complex, and diverse (within and across societies) than those of any other species.

The characteristic feature of a social relationship is that two or more people coordinate with each other so that their action, affect, evaluation, or thought are complementary. That is, what each person does (or feels, judges, or thinks) makes sense with reference to what the other persons do (or are expected to do or feel): their actions complete each other (Fiske, 1991). Although cultures and individuals vary considerably in the strength and—above all—in the forms of their sociality, all humans are deeply social by nature. People typically seek to join with others and belong, to defer and take responsibility for others, to exchange gifts, and take turns for the sake of the social relationships themselves. One purpose of social relationships is having access to social support.

Social support refers to the emotionally sustaining qualities of relationships, a sense that one is loved, cared for, and listened to. Hundreds of studies establish that social support benefits one's psychological and physical health (Uchino 2004). Social support may have indirect effects on health through enhanced mental health by reducing the impact of stress or by fostering a sense of meaning and purpose in life (Uchino, 2004). Supportive social ties might trigger physiological sequelae, reduced blood pressure, heart rate, and stress hormones, that are beneficial to health and minimize unpleasant arousal that instigates risky behavior (Uchino 2004).

While social relationships are the central source of emotional support for most people, social relationships can also be extremely stressful (Cummins, 1996; Granfield & Cloud, 2001). For example, marriage is the most salient source of both support and stress for many individuals (King & Napa, 1998; Uchino, 2004), and poor marital quality has been associated with substance use and depression (Heinz, Wu, Witkiewitz, Epstein, & Preston, 2009).

Relationship stress undermines health through behavioral, psychosocial, and physiological pathways (Kassel, Stroud, & Paronis, 2003). Stress contributes to psychological distress and physiological arousal that can damage health through cumulative wear and tear on physiological systems, and by leading people of all ages to engage in unhealthy behaviors to cope with stress and reduce unpleasant arousal (Kassel, Stroud, & Paronis, 2003). Relationship stress also undermines a sense of personal control and mental health, which, in turn, are associated with poorer QoL (Higginson & Carr, 2001). And, not surprisingly, sexual satisfaction is an important predictor for the success of intimate relationships (Butzer & Campbell, 2008).

Environment. The QoL domain for the environment includes financial resources, safety, home environment, recreation/leisure, transportation, and health of physical environment. QoL is constrained and shaped in fundamental ways by economic conditions that reflect households' command over resources and commodities. Material resources are the primary means to be eventually transformed into well-being, according to everyone's preferences, values, free will and capabilities (Roback, 1982). Wealth and poverty both have tremendous impact on one's QoL. Wealth obviously improves it in the economic sphere, but poverty undermines the QoL for everyone in an economy, not just the individual. There are many risks that might unexpectedly and adversely affect a household's future material security. These include losing one's job, worsening health conditions, problems related to aging, and even a sudden deterioration of the economic environment, such as the 2008 U.S. financial crisis. However, the concept of economic safety is not limited to the existence and magnitude of risks related to material living conditions, the probability of their materialization, and their financial implications and severity. It also includes people's and households' vulnerability and their resilience to such adverse situations. Economic safety is, therefore, not limited to whether one's own additional financial resources are

available if urgently needed, but it also includes the existence of various supportive human and social resources, such as the safety net provided by governmental subsidies or the informal mutual support mechanisms created in a society. Subjective indicators, such as the self-reported ability to cope with unexpected financial expenses, consider perceived access to these mechanisms.

Because economic safety is not merely a question of disposable income or available wealth, subjective indicators provide a more accurate picture of a person's or household's level of economic safety and resilience or, conversely, vulnerability in the face of economic risk. Moreover, selected objective indicators, such as unpaid debts or arrears on loan or rent payments, are proxies of wealth and can also be used to indicate how risk-prone a household is.

Physical safety refers to being protected from any situation that puts a person's physical security at risk, such as crime, accidents, or natural disasters. A perceived lack of physical safety may affect subjective well-being more than the actual effects of a physical threat. Homicide causes only a small percentage of all deaths, but its effect on people's emotional lives is very different from that of deaths related to medical conditions. Consequently, the effects of those crimes that affect a person's physical safety are socially magnified and influence the QoL not only of those close to the victim, but also of many others who then feel insecure or afraid.

Leisure, or the time people have outside their productive activities (either paid or unpaid), how they can spend it, and how they choose to spend it, has a significant impact on their subjective notion of well-being, their happiness, and their life satisfaction. Employment is very important to overall QoL, as noted by Stiglitz, Sen, and Fitoussi (2010): "People who become unemployed report lower life-evaluations, even after controlling for their lower income, and with little adaptation over time; unemployed people also report a higher prevalence of various

negative effects (sadness, stress, and pain) and lower levels of positive ones (joy). These subjective measures suggest that the costs of unemployment exceed the income-loss suffered by those who lose their jobs, reflecting the existence of non-pecuniary effects among the unemployed and of fears and anxieties generated by unemployment in the rest of society" (p. 103).

Lastly the health of one's living environment contributes to their overall QoL. Housing affordability is important and safe housing that is affordable is optimal. Environmental contaminants such as water and air pollution contribute to poor health in children and elderly. Loud, crowded, and overly active neighborhoods or cities can lead to social isolation and alienation for safety reasons. Additionally, both lack of adequate health and safety infrastructure and lack of transportation contribute to isolation as well. It is well documented that persons with feelings of social isolation and alienation, feeling unsafe, and unable to access basic living needs have lower QoL (De Leo & Earleywine, 2013).

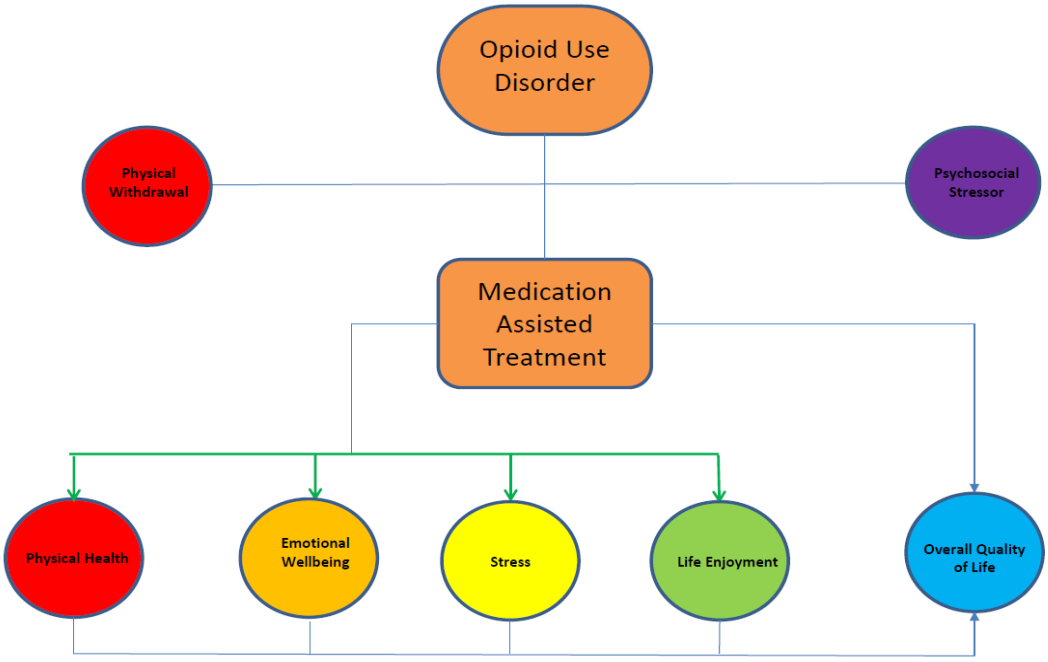
Conceptual Framework

Drawn from the QoL research cited above, Diagram 1 reflects the conceptual framework of the impact of MAT on opioid use disorders and QoL outcomes. The conceptual framework proposed will be supported by the literature review in the following chapter. Individuals with opioid use disorders experience psychosocial stressors that are associated with the costs of their SUD. In addition, when they attempt to abstinence from opioid use, they experience physical withdrawal, which is the combination of these two outcomes that result in poor QoL. When the individual engages in an MAT program, his or her physical withdrawal is arrested, the psychosocial stressors improve and he or she begins to experience improvement in his or her

physical health, emotional wellbeing, stress, and life enjoyment. The improvement in these QoL domains results in overall improved QoL.

Diagram 1

Opioid Use Disorder, Consequences, MAT and QoL Outcomes



Summary

In summary, opioid use disorders have increased significantly in the United States over the last decade (Maxwell, 2015), over 2.6 million people have an opioid use disorder (CBHSQ, 2016). As opioid use disorders have increased, so has the utilization of substance use treatment services, and 26% of treatment admissions are for an opioid use disorder, 8% of admissions occurring at OTPs where patient receive MAT (SAMHSA, 2017). Opioid use disorder has associated emotions and financial and social consequences that impact individuals and those around them (Mark et al., 2011; NIDA, 2012b). The current measure of treatment success is

continual abstinence from substance use. This outcome, while having some value in treatment efficacy research, is not necessarily the best measure for MAT. This is especially true given that goals of MAT are often different from the motives that really lead individuals to enter treatment. This conceptual framework proposes that when research is conducted to study medication-assisted treatment efficacy, a crucial measure to be included is whether persons with opioid use disorders who enter treatment experience improvement in their overall QoL, as well as each individual domain that encompasses our understanding of QoL.

Literature Review

Introduction

A review of the literature on opioid use, medication-assisted treatment, and QoL is presented in this chapter. Literature was selected from online databases, journal manuscripts, and books. The review begins with an overview of the history and significance of opioid use in the United States as well as general prevalence data. It follows with a presentation of the existing literature about the harm reduction model for treating opioid use disorders and includes the clinical effectiveness of medication-assisted treatment. Next, treatment with methadone, buprenorphine, and naltrexone will be discussed. A discussion of QoL in addiction research and MAT follows. Finally, significant gaps in the literature are summarized. Literature for this review is selected from the National Library of Medicine database called PubMed, the Cochrane Database of Systematic Reviews (CDSR), and EbscoPsych databases for literature published from 1993 to 2016. The range of time for literature selection is based on the large wave of research on addiction in the early to mid-1990s. Literature was selected if it pertained to opioid use, opioid use disorder, opioid treatment, methadone treatment, medication-assisted treatment, opioid substitution treatment, and topics related directly to participant QoL. Only quantitative studies are included in this review for completeness of exploring the problem. The quality of the literature is good, including large-scale studies (quantitative studies with greater than 300 participants) and meta analyses.

Although the term “opioids” originally referred to drugs directly derived from the opium poppy and the term “opioids” was used to describe synthetic opioids, the term “opioids” is currently used to describe all opioids with no distinctions made between those that are natural or

synthetic. However, the terms are used here interchangeably throughout because some of the studies reviewed here do not make the distinction between these terms.

History, Prevalence, and Consequences of Opioids

The history of opium use dates from ancient times and opium was historically used by the Egyptians and persons from many other nations from the Middle East. In Greek mythology, opium was consumed by people for pain relief and sleep. The opium poppy was associated with various gods such as Hypnos, Nyx, and Thanatos and it was a customary practice for Grecians to use opium for sleep and pain relief (Smith, 2016). Opium, often consumed in the arts scene since the beginning of the 19th century, was initially used for its calming and euphoric effects, and related problems were only reported much later (Miller & Tran, 2000). Nevertheless, in the 17th century smoking of opium resulted in a major boom of addiction problems in China (Brownstein, 1993). Heroin, a synthetic derivative of opium, was first synthesized in 1874 by C. R. Alder Wright, an English chemist in London, and by 1898, the Bayer laboratories started the production of heroin as a nonaddictive substitute for morphine. Soon, heroin was found to be as addictive as morphine, and resulted in a number of serious social consequences, such as crime (Miller & Tran, 2000). In 1913, Bayer decided to stop making heroin, given the addictive properties of the drug. In the United States, the Heroin Act of 1924 made the manufacture and possession of heroin illegal for all use, including medical use. Since that time, the illicit production and trafficking of heroin has been growing (Aggrawal, 1995).

In the United States, physicians began discussing the negative effects of heroin and opioid use in medical journals. By 1903 heroin addiction had risen to alarming rates, and in 1905 the U.S. Congress banned opium (Aggawal, 1995). In 1914, the Passage of the Harrison Narcotics Act was enacted, resulting in a profitable illegal heroin market that grew and thrived

for the next 60 years (Aggawal, 1995). By the 1970s, and the Vietnam War, the Federal government acknowledged that the use of opioids, mainly heroin, was associated with problematic drug use and related problems, moving President Nixon to create the Drug Enforcement Administration (DEA) to fight the "War of Drugs" (Aggrawal, 1995; White, 1999).

In the last decade, opioid use has become a serious health and social problem, urging for innovative and effective interventions to deal with the abuse and addiction associated with its use. In 2015, the SAMHSA estimated that about 27.1 million persons in the United States are illicit drug users, of which 4.1 million report misusing opioids (CBHSQ, 2016). According to the 2016 National Survey on Drug Use and Health (SAMHSA, 2017), the majority of illicit opioid users (3.8 million) are misusers of prescription opioids. Americans' consumption of 60% of the worldwide prescribed opioids is blamed for leading to what public health officials are calling "one of the worst drug crises in American history" (Centers for Disease Control (CDC), 2017).

Although opioids are used by a minority of the U.S. population, the cost of opioid-abusing individuals to society is high and includes unemployment and illegal activities (Meyer et al., 2014). Further, mortality rates are much higher among illicit opioid users as compared to other drug users (CDC, 2017). Mortality rates of opioid-dependent individuals are between 6 and 20 times higher than among the general population, especially among those injecting drugs (Hegegaard, Chen, & Warner, 2015; Kresina, Melinda, Lee, Ahadpour, & Robert, 2015; Rudd, Seth, David, & Scholl, 2016;). Moreover, many persons with an opioid use disorder are poly-drug users, frequently using other substances, such as benzodiazepines, alcohol, cannabis, cocaine, and crack (Fischer, Rehm, Brissette, Brochu, Bruneau, El-Guebaly, & Baliunas, 2005; Jones, Mogali, & Comer, 2012; Leri, Bruneau, & Stewart, 2003; Saunders, Von Korff, Campbell, Banta-Green, Sullivan, Merrill, & Weisner, 2012). In addition, the majority of drug-

related deaths and morbidity, such as overdose and infectious diseases, is associated with opioid use, mostly due to heroin that is often combined with other drugs (Bargagli, Hickman, Davoli, Perruci, Schifano, Buster, & Vicente, 2005; Darke & Hall, 2003; Jones, Mogali, & Comer, 2012). Frequently mentioned health consequences of persons with opioid use disorder are overdose, HIV infection, transmission of hepatitis C virus, lung abscesses, and many of these health complications are found among injecting users (Birnbaum et al., 2011; Bruneau, Lamothe, Franco, Lachance, Désy, Soto, & Vincelette, 1997; Fischer, Haydon, Rehm, Kraiden, & Reimer, 2004; Hedrich, Pirona, & Wiessing, 2008). Opioid users who are seeking treatment are more often unemployed, have lower levels of education, and more psychiatric problems as compared to nonopioid users (Birnbaum et al., 2011). In general, opioid use disorder is associated with serious problems in different life areas that include economic, psychological, and health complications (Birnbaum et al., 2011; Meyer et al., 2014; Vanderplasschen, Rapp, Wolf, & Broekaert, 2004). Consequently, it is not surprising that the number of individuals seeking treatment for opioid use is increasing (Alderks, 2017).

Harm Reduction and Medication-Assisted Treatment

The above-mentioned findings illustrate the need for a variety of approaches in substance abuse treatment, including harm reduction (HHS, 2016; Järvinen, 2008). Originally, substance abuse treatment was characterized by a drug-free approach, in which drug-free therapeutic communities had a prominent place. Nevertheless, due to high relapse rates and the recognition that one single treatment modality does not meet the needs of all individuals with substance abuse problems, the need for an integrated treatment approaches, including harm reduction initiatives, has been advanced (Broekaert & Vanderplasschen, 2003; Hawk, Vaca, & D'Onofrio, 2015; HHS, 2016; McKeganey, 2005). In the effort to curb drug use and its associated

consequences in the United States, extensive attention is given to the reduction of harm caused using drugs. Harm reduction is characterized by a humanistic, nonjudgmental treatment approach, with respect for the autonomy of individuals using drugs and emphasizes their rights for health care (Brocato & Wagner, 2003; Denning, 2001). The primary goal of harm reduction is not to combat the use of drugs, but to diminish the harm associated with drug use (Andersen & Järvinen, 2007; Lenton & Single, 1998). As such, many have come to recognize that a practical approach to combating drug use includes a comprehensive and integrative drug policy that includes prevention, abstinence-oriented treatment, and harm reduction initiatives. This approach to curbing drug use has become generally accepted in the last decade (Broekaert & Vanderplasschen, 2003; HHS, 2016; Marlatt, Blume, & Parks, 2001).

Medication-assisted treatment is one of the pillars of the harm reduction approach (Andersen & Järvinen, 2007; Rosenbaum, Washburn, Knight, & Irwin, 1996). The combination of behavioral interventions and medications such as methadone, buprenorphine, and naltrexone are used treat opioid use disorders (Bonhomme, Shim, Gooden, Tyus, & Rust, 2012). The main goals of MAT are the reduction of illicit opioid use, preventing harm caused from using opioids, and improving the well-being of persons with an opioid use disorder (Amato, Davoli, Perucci, Ferri, Faggiano, & Mattick, 2005; World Health Organization [WHO], 2009). Research has shown that MAT is one of the most effective forms of treatment for persons with an opioid use disorder for whom an abstinence-oriented approach is not always adequate (HHS, 2016; Mattick, Breen, Kimber, & Davoli, 2009; WHO, 2004). This is further inspired by the chronic and relapsing character of opioid use disorder, influencing a long-term treatment approach to the treatment of opioid use disorders (Van den Brink & Haasen, 2006; Volkow, Frieden, Hyde, &

Cha, 2014). In 2015, an estimated 356,000 opioid users in the United States were utilizing a type of MAT, with most (287,000) using methadone (CBHSQ, 2016).

Methadone has been the most used medication to treat opioid use disorders (HHS, 2016). Since Dole and Nyswander (1965) demonstrated the effectiveness of methadone as a substitute drug for heroin, methadone has slowly become an important mainstay in MAT and a key element in the establishment of harm reduction initiatives in the last decade. Methadone is a long-acting opioid agonist that causes physiological stability, eliminates opioid withdrawal symptoms, and blocks the euphoric effects of heroin use (Mattick et al., 2009). In general, methadone is the standard, evidence-based treatment for opioid use disorders in most countries.

Many studies have evaluated its effectiveness, demonstrating prolonged treatment retention and a reduction in heroin use, risk behavior (related to injecting drugs), and drug-related crime (Amato et al., 2005; Connery, 2015; Farrell, Ward, Mattick, Hall, Stimson, Jarlais, & Strang, 1994; Mattick et al., 2009; Ward, Hall, & Mattick, 1999). There is abundant evidence that methadone maintenance therapy and higher doses of methadone (> 60 mg) are both more effective than detoxification with methadone and lower doses of methadone in achieving abstinence and prolonging treatment retention (Amato et al., 2005; Bao, Liu, Epstein, Du, Shi, & Lu, 2009; Mattick et al., 2009; WHO, 2009). Furthermore, (voluntary) psychosocial therapy in addition to the administration of methadone appears to be an essential component of MAT (Amato, Minozzi, Davoli, Vecchi, Ferri, & Mayet, 2004; HHS, 2016; McLellan, Arndt, Metzger, Woody, & O'Brien, 1993; Volkow et al., 2014; WHO, 2004).

Clinical Effectiveness of Medication-Assisted Treatment

Methadone has been in use for almost 40 years and its efficacy as a treatment compared to other forms of therapy has been investigated extensively, leading to claims that it is the most

researched of the available treatments (Banta-Green, 2015; Farrell et al., 1994). Studies have examined its impact on a wide range of different outcomes including the following: use of illicit drugs (Dole, 1988; Dole & Joseph, 1978; Fischer et al., 2005; Hubbard, Craddock, & Anderson, 2003; Hubbard, Marsden, Rachel, & Harwood, 1990; Leri, Bruneau, & Stewart, 2003; Neale, Steard, & Tompkins, 2007; Radcliffe & Stevens, 2008); participation, compliance, and retention in treatment (Banta-Green, 2015; Feelemyer, Des Jarlais, Arasteh, Abdul-Quader, & Hagan, 2014; Joe, Simpson, & Bromme, 1999); vocational outcomes (Dole, 1988; Joseph, Stancliff, & Langrod, 2000); criminal activity and imprisonment (Dole, 1988; Dole & Joseph, 1978; Hubbard, Craddock, & Anderson, 2003; Hubbard, Marsden, Rachel, & Harwood, 1990); mortality (Bargagli et al., 2005; Dart, Surratt, Cicero, Parrino, Severtson, Bucher-Bartelson, & Green, 2015; Paulozzi, Mack, & Centers for Disease Control and Prevention, 2014); health (Buchholtz, Krol, Rist, Nieuwkerk, & Schippers, 2008; Deering, Frampton, Horn, Sellman, Adamson, & Potiki, 2004; Giacomuzzi, Riemer, Kemmler, Ertl, Richter, Rössler, & Hinterhuber, 2001; Millson, Challacombe, Villeneuve, Fischer, Strike, Myers, & Pearson, 2004); HIV infection (Kresina et al., 2015; Lawrinson, Ali, Buavirat, Chiamwongpaet, Dvoryak, Habrat, & Zhao, 2008; Woody, Bruce, Korthuis, Chhatre, Poole, Hillhouse,…Ling, 2014); and risky injecting and sharing of injecting equipment (Bruneau et al., 1997; Fischer et al., 2004; Neaigus et al., 2001; Préau, Protopopescu, Spire, Sobel, Dellamonica, Moatti, & Carrieri, 2007).

Of the studies cited, only six were randomized controlled trials (RCTs); the others were observational studies, either comparing self-selected MAT participants with people receiving other treatments or using pre- and post-testing within the same population as they progress through treatment. Such a large body of work is most easily appraised through systematic reviews that have summarized the findings and augmented them using meta-analytic methods.

Several reviews have systematically examined these and allied studies to evaluate the conclusions that can reasonably be drawn. These include two major academic textbooks (Ries, Fiellin, Miller, & Saitz, 2014; El-Guebaly, Carra, & Galanter, 2015), two reports from authoritative bodies (Gerstein & Harwood, 1990; Rettig & Yarmolinsky, 1995), and two reviews published in peer-reviewed journals (Farrell et al., 1994; Marsch, Bickel, Badger, & Jacobs, 2005). These studies concluded that MAT is beneficial and effective. Mattick's 2003 meta-analysis of MAT confirmed that methadone is an effective intervention for the management of heroin dependence, that methadone is superior to the drug-free alternatives (placebo medication, offer of drug-free treatment, detoxification, or waiting-list control) for retaining patients in treatment and that it is also reducing and eliminating illicit heroin use. While the above referenced studies demonstrate the effectiveness of MAT in decreasing illicit opioid use and retaining patients in treatment, a more limited number of studies have focused on QoL as an outcome (De Maeyer, Vanderplasschen, & Broekaert, 2009), and as a result, interest in QoL in addiction research, mainly among opioid users, has grown extensively.

Quality of Life

Attention for the essential aspects of a good life is an age-old theme, discussed by various philosophers such as Aristotle, but the specific use of the term "quality of life" did not occur until more than 2,000 years later. During the 20th century, QoL has become an important economic, medical, and social standard of our modern society (Schalock, 1996).

The term "quality of life" was first used after World War II to describe the effect of material welfare on individuals' lives (Massam, 2002). Due to the economic prosperity and the improved standard of living at the end of the war, an interest in the concept of QoL was noticed in the general population—both at societal and individual levels. This economic model of QoL

originally was related to material goods without attention to the subjective well-being of individuals (Cummins, Lau, & Stokes, 2004).

By the 1960s, this exclusive focus on the wealth of individuals was questioned and the conceptualization of QoL was extended to issues such as family, health, and housing to gain insight into the QoL of society as a whole in the "social indicators" movement—a social, scientific index of the well-being of the general population (Diener & Suh,1997; Farquhar, 1995; Rapley, 2003). Since the 1970s, increasing attention has been given to QoL in health care research and clinical practice, especially for patients with chronic disorders (Moons, Budts, & De Geest, 2006). Developments in the medical field and health care system have not only resulted in an increased life expectancy, but also in a higher number of individuals with chronic illnesses (Higginson & Carr, 2001; Katschnig, 2006; Moons et al., 2006; Van den Bos & Triemstra, 1999). Attention is no longer only given to how the life of individuals suffering from illnesses could be prolonged, but also to how their sense of well-being could be improved, including a focus on nondisease aspects (Farquhar, 1995; Katschnig, 2006).

However, QoL is often simplified in the medical field to only describe a person's health status, often referred to as health-related QoL (HRQoL). Unfortunately, the concept of HRQoL is frequently misused as a synonym for QoL (Cummins, Lau, & Stokes, 2004). Quality of life and health related quality of life are not the same.

While QoL and HRQoL are used interchangeably in healthcare research literature, each has its own meaning. QoL is a broader concept that covers all aspects of life. It can be defined in many ways that makes its measurement difficult. Illness and treatment of that illness can affect a patient's psychological, social, and economic well-being, as well as biological status. HRQoL has a focus on the effects of illness and specifically on the impact that treatment might have on

QoL. HRQoL focuses on the effects of a disease or health condition on the daily functioning of individuals (Wiklund, 2004), with special attention to their physical and mental health (Millson et al., 2004; Mooney, 2006). HRQoL can help us understand the distinction between aspects of life related to health. QoL can help us understand those aspects of life that extend beyond health such as education, relationships, and the social environment. The focus of HRQoL is on pathology and deficits, while QoL includes more positive attributes such as, a person's overall well-being and satisfaction with life (Laudet, Becker, & White, 2009). HRQoL may influence an individual's QoL, but it does not fully represent it (Zubaran & Foresti, 2009). A clear distinction between both concepts should be made when talking about QoL research; the absence of pathology is not the same as having a good QoL (Moons et al., 2006; Cummins, Lau, & Stokes, 2004).

In social sciences, a different view of how QoL should be conceptualized has been applied and is often used in the field of mental health. Over the last two decades, there has been a tremendous change in the way care and support are provided to people with mental disorders and long-term care needs. This is mainly the result of the deinstitutionalization process in mental health care, including a focus on more community-based support (Katschnig, 2006). A shift from a strict medical model of care has led to movement toward a support model that gives a central position to the patient's own perspective and opinion as the starting point of treatment (Carr, Gibson, & Robinson, 2001; Davidson, Shahar, Lawless, Sells, & Tondora, 2006; Diener & Suh, 1997). Empowerment, control, and participation of patients are central concepts in this approach. One of the most noticeable and comparable evolutions has been the focus of QoL outcomes in the field of disability studies (Cummins, 2005). Since the 1980s, QoL has emerged as an important concept in the support of individuals with intellectual disabilities, with the goal being a

"fulfilling citizenship" (van Gennep, 1997). This change was mainly based on (a) the limited impact of a purely technocratic approach of treatment; (b) more attention to community-based support; and (c) the rise of patient empowerment with a focus on person-centered planning (Schalock, Brown, Brown, Cummins, Felce, Matikka, Keith, & Parmenter, 2002). Nowadays, QoL has been acknowledged as an important outcome measure and useful assessment tool in health care for individuals suffering from chronic illnesses, especially mental illness and substance use disorders (Katschnig, 2006; Higginson & Carr, 2001; Van den Bos & Triemstra, 1999).

Patients' self-reported outcomes regarding QoL have become an increasingly important source of information in health care. This has been furthered by the prevalence of various chronic illnesses that require ongoing treatment (Higginson & Carr, 2001; Katschnig, 2006; Van den Bos & Triemstra, 1999). The limited curing effect of treatment services for chronic diseases, such as diabetes and depression, for example, has created the need for long-term treatment and a shift from cure to care with specific attention on the patients' perspectives (Wiklund, 2004). Currently, the best-known patient-reported outcome is QoL (Valderas et al., 2008; Winklbaur, Jagsch, Ebner, Thau, & Fischer, 2008).

Quality of Life in Addiction Research

Despite a shift from objective to more subjective outcome measures in both general care and mental health care, attention to patients' perspectives is still limited in the field of addiction research (Laudet, 2011; Neale, Sheard, & Tompkins, 2007). Traditionally, evaluation studies in addiction start from a one-sided focus based on the norms and values of society, which are centered on abstinence from drug use instead of the drug users' own subjective experiences (Fischer, Rehm, & Kim, 2001; Stajduhar, Funk, Shaw, Bottorff, & Johnson, 2009). In general,

attention is mostly given to socially desirable outcomes such as employment, no drug use, and no criminal involvement (Fischer et al., 2005; Mattick et al., 2003; Ward, Hall, & Mattick, 1999), and health-related outcomes such as preventing infectious diseases (Farrell, Gowing, Marsden, Ling, & Ali, 2005; Verrando, Robaeys, Mathei, & Buntinx, 2005). Until the 1990s, only limited attention was given to QoL in the addiction research field. This contrasts with the substantial number of randomized controlled trials reporting on QoL research for other chronic illnesses, such as cancer and cardiovascular diseases (O'Brien, Mattick, White, Breen, Kimber, Ritter, & Lintzeris, 2006). One of the first studies of QoL among drug users by Ryan and White (1996) showed that the HRQoL of heroin users starting treatment was significantly worse than the general population and most comparable with individuals with psychiatric disorders (Callaly, Trauer, Munro, & Whelan, 2001). Torrens, San, Martinez, Castillo, Domingo-Salvany & Alonso, (1997) observed a noticeable improvement of HRQoL among persons in methadone maintenance treatment (MMT), especially during the first month of treatment. A review of these early QoL studies among alcohol and drug users (Rudolf & Watts, 2002) did not allow for general conclusions due to the small number of studies and the use of different concepts of QoL. Since 2000, however, interest in QoL in addiction research among opioid users has grown extensively. This goes hand in hand with the recognition that substance use disorders are a chronic, relapsing disorder that might have negative consequences for various life domains.

Despite the methodological limitations mentioned above, QoL is an important indicator that is not captured by traditional and objective outcome measures and it can be used to tailor drug treatment to drug users' needs. Opioids remain a significant drug of use for many individuals entering treatment (SAMHSA, 2017), and although the number of persons with an

opioid use disorder remains high (SAMHSA, 2016), only fragmented and often conflicting information on their QoL is available.

Medication-Assisted Treatment and Quality of Life

Medication-assisted treatment is one of the areas in QoL research that has been studied. Given the longitudinal nature of MAT and that MAT is built upon a harm reduction model in which abstinence is not the primary goal of treatment, researchers have focused instead on QoL outcomes (Potik, Adelson, & Schreiber, 2007). Moreover, patients receiving MAT report that QoL outcomes are the most important measures of the success and effectiveness of their treatment (De Maeyer, Vangerplasschen, & Broekaert, 2009; Ruefli & Rogers, 2004).

Twenty-one longitudinal studies reported on the medium and long-term effects of MAT on HRQoL and subjective QoL of subjects with opioid use disorder. At treatment entry, individuals usually reported poor HRQoL, including emotional problems and difficulty sleeping (Lawrinson et al., 2008; Mitchell, Gryczynski, Kelly, O'Grady, Jaffe, Olsen, & Schwartz, 2015; Puigdollers, Domingo-Salvany, Brugal, Torrens, Alvarós, Castillo, & Vazquez, 2004). During treatment, Villeneuve, Challacombe, Strike, Myers, Fischer, Shore, and Millson (2006) using the Short Form (36) Health Survey (SF-36), a 36-item, patient-reported survey of patient health, reported significant improvements on six domains of the SF-36 and the mental component summary score. The results indicated that most improvements were observed in the mental health domain six months after the start of treatment. Several studies using the WHOQoL-Bref, a 26-item QoL survey that measures physical health, psychological health, social relationships, and environment, has similar findings indicating that significant improvements occur in the early stages of MAT (Baharom et al., 2012; Fei et al., 2016; Kobra et al., 2012; Mitchell et al., 2015). Long-term effectiveness of MAT in combination with the Community Reinforcement Approach

(CRA) has been highlighted in a study by De Jong, Roozen, van Rossum, Krabbe, & Kerkhof, (2007). When compared to individuals who are treated with medication for other chronic illnesses, such as diabetes, asthma, epilepsy, and schizophrenia, opioid use disorder individuals showed comparable or even greater improvements in HRQoL after MAT (O'Brien et al., 2006).

Comparable long-term positive effects of MAT on subjective QoL were found in various studies. A study in Geneva (Dazord, Mino, Page, & Broers, 1998) showed low scores for subjective QoL at the start of treatment but reported significant improvements for individuals who were still in MAT after 12 months, including improved satisfaction for the domains related to health, worries, material conditions, and money.

Similar positive results after 6 months were found in a study among persons with opioid use disorder who engaged in outpatient MAT who were prescribed methadone for the first time (Baharom et al., 2012; Padaiga, Subata, & Vanagas, 2007). Long-term gains were reported by Karow, Verthein, Pukrop, Reimer, Haasen, Krausz, and Schäfer (2011) after 12 months of continuous MAT in physical health, psychological well-being, and social functioning. Vignau and Brunelle (1998) compared the subjective QoL of persons treated with buprenorphine by a general practitioner or specialized addiction center and found similar positive outcomes during treatment for both groups after 3 months and continuing after 6 months. In addition, Giacomuzzi et al. (2001) demonstrated the positive effects of MAT by showing that individuals with opioid use disorders scored significantly worse on general health and psychological well-being prior to treatment than a similar group of opioid users 4 months after starting MAT.

Overall, opioid users usually report low HRQoL and subjective QoL at admission to MAT, regardless of medication used (Dazord et al., 1998; Habrat, Chmielewska, Baran-Furga, Keszycka, & Taracha, 2002; Millson, Challacombe, Villeneuve, Strike, Fischer, Myers, &

Hopkins, 2006), which is often followed by significant improvements in various life domains during the first months of treatment (Kobra et al., 2012; Mitchell et al., 2015; Reno & Aiken, 1993; Torrens et al., 1997). Subsequent stabilization (Karow et al., 2011; Lawrinson et al., 2008; Torrens et al., 1997) or regression, but not to the prior level of use may follow as treatment continues (Giacomuzzi, Riemer, Ertl, Kemmler, Rössler, Hinterhuber, & Kurz, 2005; Habrat et al., 2002). Several authors speculated that there might be a negative relationship between individuals' initial expectations about life and QoL after 12 months (Dazord et al., 1998). When faced with difficulties in fulfilling their often high expectations, this might have an adverse impact on the individual's perception of QoL (Fei et al., 2016; Habrat et al., 2002).

Comparison of Various Forms of Medication-Assisted Treatment

Medication-assisted treatment for opioid use disorders primarily includes the use of methadone (81%), buprenorphine (12%), and naltrexone (7%) (SAMHSA, 2017). In understanding the various medications used in MAT, it is important to understand the basic chemistry of the medications. Different types of opioid receptors—or molecules to which opioid compounds attach themselves and release their effects—are present in the brain. Agonists are drugs that activate these receptors, binding to them and producing a euphoric effect. Antagonists also bind to opioid receptors, but rather than producing a euphoric effect, they block the effects of opioid compounds. Partial agonists bind to the receptors and activate them, but not to the same degree as full agonists (Strain & Stilzer, 2005). Methadone is a synthetic opioid agonist that has been used to treat the symptoms of withdrawal from heroin and other opioids (Fernandez & Libby, 2011; Kreek et al., 2010). Methadone may only be dispensed for treatment of an opioid use disorder within licensed opioid treatment programs (OTPs). Buprenorphine is a partial opioid agonist, meaning that it binds to and activates opioid receptors but with less intensity than full

agonists (Strain & Stilzer, 2005). As a result, there is an upper limit to how much euphoria, pain relief, or respiratory depression buprenorphine can produce (Pathan & Williams, 2012). Buprenorphine can be prescribed alone or as a combination medication that includes naloxone, an opioid antagonist medication (Jacobs, Ang, Hillhouse, Saxon, Nielsen, Wakim, & Blaine, 2015). Buprenorphine may be prescribed by physicians in private practice as well as through OTPs (CSAT, 2004). Naltrexone is an opioid antagonist. Naltrexone is not a controlled substance and can be prescribed by any physician without training or experience. Naltrexone requires that patients be abstinent from opioids for a period prior to induction. And once treatment begins, the patient is at substantial risk for overdose if they do use opioids (SAMHSA, 2015d).

Ten studies—five cross-sectional and five longitudinal—have compared the effectiveness of two or more types of MAT on individuals' HRQoL or subjective QoL. Methadone treatment was included in each of the studies.

Methadone. A randomized controlled trial that compared the HRQoL of opioid-dependent persons who were treated with diacetylmorphine and oral methadone with that of individuals treated only with oral methadone showed that both groups had a better HRQoL after 9 months; however, no group differences between baseline and the 9-month follow-up could be found (March, Ovieda-Joeles, Perea-Milla, & Carraro, 2006). A comparison between a methadone maintenance and harm reduction program (i.e., needle exchange, daily dose of 20 mg methadone, and access to medical services) did not reveal group differences for any of the 8 domains of the SF-36, although the perceived change in a person's health status as compared to the previous year deteriorated in the harm reduction program and improved in the methadone program (Rooney, Freyne, Kelly, & O'Connor, 2002). Winklbaur et al. (2008), compared individuals prescribed methadone to persons receiving slow release morphine over a 14-week

period. They found that individuals on methadone showed improvements in general well-being at 7 and 14 weeks, whereas the slow release morphine group did not. However, at 14 weeks both groups had shown modest improvement in general well-being, general health, mental health, and leisure time. Karow et al. (2011) compared persons receiving heroin assisted treatment and methadone over a 12-month period. QoL improved for both groups but did not reach the levels of the health controls, and for the QoL gains to be sustained, the individuals must continue in treatment indefinitely.

Buprenorphine. Five studies reported on the subjective QoL of opioid-dependent subjects on buprenorphine treatment. A longitudinal study by Ponizovsky and Grinshpoon (2007) has illustrated that both methadone and buprenorphine maintenance treatment had positive effects on the satisfaction with QoL on all measured domains after 4 and 8 months. Among the methadone group, these improvements were already noticeable after 1 month of treatment, while it usually takes longer to experience similar positive effects of buprenorphine treatment. On the other hand, Maremmani, Pani, Pacini, and Perugi (2007) reported significantly better subjective QoL scores for total QoL and working at the end of the third month of treatment for the buprenorphine group as compared to the methadone group. By the twelfth month, there was a significant improvement in subjective QoL for both treatment groups, but no significant group differences were shown. Also, Giacomuzzi, Kemmler, Ertl, and Riemer (2006) compared the subjective QoL between individuals in methadone and buprenorphine maintenance treatment. After 6 months, both groups showed improvements in QoL, including, for the buprenorphine group, and significantly better scores for overall satisfaction with life. Comparable positive results on subjective QoL were found for methadone treatment and treatment with buprenorphine (Giacomuzzi, Riemer, Ertl, Kemmler, Rössler, Hinterhuber, & Kurz, 2003; Giacomuzzi et al.,

2006; Ponizovsky & Grinshpoon, 2007), suggesting that buprenorphine could be as effective as methadone to improve individuals' subjective QoL in the treatment of opioid use disorder.

Naltrexone. There have been very few studies evaluating QoL outcomes. Only one study by O'Brien and colleagues (2006) compared the HRQoL of heroin users who engaged in three different treatment types: naltrexone, methadone, and buprenorphine. The study found significant improvements after 3 months on all 8 domains of the SF-36 and the mental and physical composite score. The latter scores even approached the general population norms. No significant differences were found among the groups for the physical and mental composite scores at follow-up.

Mediators and Predictors of Quality of Life

Several studies have assessed mediators and predictors of poor HRQoL. Most frequently, age, gender, drug use severity, and comorbid psychiatric problems have been identified as potential mediating variables. However, few studies have included these variables in a multivariate analysis.

Age and Gender. An inverse relationship between age and QoL has been observed, with older opioid users usually having worse QoL than younger users (Bizzarri, Rucci, Vallotta, Girelli, Scandolari, Zerbetto, Dellantonio, 2005; Deering et al., 2004; Lofwall, Brooner, Bigelow, Kindbom, & Strain, 2005; Millson et al., 2006), although other authors could not demonstrate such an association (Astals, Domingo-Salvany, Castillo Buenaventura, Tato, Vazquez Martín-Santos, & Torrens, 2008; Dazord et al., 1998; Puigdollers et al., 2004). The results regarding gender were conflicting. There was a tendency towards lower QoL scores among women with opioid use disorders. Gender differences are most obvious at admission (Haug, Sorensen, Lollo, Gruber, Delucchi, & Hall, 2005; Puigdollers et al., 2004; Ryan & White,

1996). Bizzarri et al. (2005) reported significantly lower QoL scores in the physical and psychological domains for women in treatment. On the other hand, several authors (Dazord et al., 1998; Deering et al., 2004; Habrat et al., 2002; Millson et al., 2006) did not observe a significant association between gender and QoL during treatment. Moreover, none of the multivariate analyses could demonstrate an independent impact of gender on QoL (Astals et al., 2008; Torrens et al., 1997).

Drug and Alcohol Use. No clear relationship was found between QoL and the use of specific substances or the amount, duration, and frequency of drug use (Deering et al., 2004; Millson et al., 2006; Ryan & White, 1996). Almost all studies that have reported a negative association between drug use and QoL used only a HRQoL instrument (Deering et al., 2004). Consequently, little information was available on the impact of drug use on other life domains such as family relations, leisure time, social participation, and housing. A study by Bizzarri et al. (2005), was the only study using the World Health Organization Quality of Life Brief Survey (WHOQoL-Bref), a multidimensional QoL instrument. It found no major influence of current substance use on any of the QoL domains measured by this survey. Comparable results were found concerning HRQoL in a study by Karow, Verthein, Krausz, and Schäfer (2008), who found no association between actual drug use and HRQoL two years after the start of treatment. Moreover, in at least one study, the use of cannabis and alcohol were likely to have a positive effect on various domains of HRQoL (Ryan & White, 1996).

Recent cocaine use (last 30 days) has been associated with worse scores on the mental component of the SF-36 (Millson et al., 2006). Astals et al. (2008) found inconsistent results for the influence of cocaine use and frequency of use in the last 30 days on the physical component score, while intravenous cocaine use correlated significantly with lower mental health scores.

Also, regular use of stimulant drugs (Astals et al., 2008) correlated negatively with the physical component score of the SF-36, while older age at first injection was associated with worse physical component scores (Millson et al., 2006). A negative impact of excessive alcohol use on HRQoL, especially role limitations, social functioning, and physical health, has been shown by several studies (Karow et al., 2008; Ryan & White, 1996; Senbanjo, Wolff, & Marshall, 2006).

Worse overall HRQoL scores among heroin users 12 months after starting methadone have been associated with the use of higher amounts of heroin at baseline and with the higher methadone doses during treatment, while side use of heroin did not predict worse HRQoL (Torrens et al., 1997). On the other hand, Deering et al. (2004) found no association with methadone dosage, nor could they demonstrate an association between subjective QoL and the number of methadone MAT admissions and duration of current treatment, respectively.

Treatment. A 33-year follow-up study by Hser (2007) compared recovered (at least 5 years of heroin abstinence) with nonrecovered heroin-dependent males and found better QoL scores among the recovered individuals. Karow et al. (2008) found lower QoL scores among persons with opioid use disorder who were still in MAT after 2 years than in the group no longer in treatment. Also, Eklund, Melin, Hiltunen, and Borg (1994) reported more favorable subjective QoL scores for patients who successfully terminated from MAT as compared to patients who were still in treatment. Muller, Skurveit & Clausen (2016) compared QoL outcomes across all treatment settings (residential, outpatient, MAT) and found that persons with opioid use disorder who had received MAT had better QoL ratings than those who did not. However, the MAT treatment group QoL improvements were not significantly better or worse than other treatment types.

Comorbidity. A limited number of studies have reported on the influence of psychiatric disorders on QoL of individuals with an opioid use disorder receiving MAT. Individuals entering MAT score low on psychological measures of QoL (De Maeyer et al., 2010; Fassino, Abbate Daga, Delsedime, Rogna, & Boggio, 2004; Giacomuzzi et al., 2001; Puigdoller et al., 2004; Ryan and White, 1996). According to Astals et al. (2008), while persons entering MAT had significantly worse scores on the mental components of the SF-12, no direct influence of dual diagnosis could be observed on the mental composite scores of heroin abusers during treatment, both groups reported a very poor HRQoL. Other authors (Karow et al., 2008; Fassino et al., 2004) have demonstrated the negative impact of having a personality disorder on the subjective QoL of opioid users. And persons with an opioid use disorder who have a comorbid psychiatric disorder report significantly lower scores for the psychological and physical domains of the WHOQoL-Bref as compared to persons without a psychiatric disorder (Bizzarri et al., 2005; Mitchell et al., 2015).

Other Mediators and Predictors of Quality of Life. Occasionally, some other variables have been linked to a poor QoL, such as recent utilization of medical services (Ryan & White, 1996), use of prescription medication (Deering et al., 2004), having a chronic disorder, recent hospitalization for physical problems, and emotional and sexual abuse (Millson et al., 2006). Legal problems (Karow et al., 2008) and imprisonment (Astals et al., 2008) have been associated with poor physical health, while family conflicts (especially with a partner) have been linked to both lower mental and physical health component scores (Karow et al., 2008). Results for the influence of educational level on QoL have been inconsistent (Astals et al., 2008; Deering et al., 2004; Puigdollers et al., 2004). Only a few studies have looked at the role of HIV on the QoL of

individuals with an opioid use disorder and MAT, and these also report conflicting findings (Dazord et al., 1998; Habrat et al., 2002; Puigdollers et al., 2004; Torrens et al., 1997).

Opioid Use Disorder and Quality of Life

Based on a review of 43 articles, the subjective QoL and HRQoL of individuals with an opioid use disorder is relatively low as compared to the general population and people with various medical illnesses. One possible explanation might be that HRQoL is often assessed among opioid users starting treatment, which might result in an underestimation of HRQoL among the wider population of opioid users (Buchholz et al., 2008). Moreover, drug users in treatment differ from untreated drug users in a variety of ways, such as higher rates of depressive disorders (Eland-Goossensen, van de Goor, & Garretsen, 1997; Rounsaville & Kleber, 1985). Opioid users report lower scores on mental health in particular, while their physical well-being is less affected. O'Brien et al. (2006) even found comparable results with the general population concerning physical health after a 3-month treatment period.

Generally, participation in MAT seemed to have a positive effect on individuals' QoL (De Maeyer, Vanderplasschen, & Broekaert, 2010). Improvements on various life domains, including HRQoL and subjective QoL, were most obvious during the first months of treatment (Mitchell et al., 2015). This may be explained by the fact that individuals with an opioid use disorder often find themselves in a crisis situation at the start of treatment and enter treatment in very poor condition, resulting in very low QoL scores at admission (Hser, 1988; Reno & Aiken, 1993). Still, the observed improvements persisted over a long-term period, although less favorably than during the first months of treatment (Karow, et al., 2011), illustrating the positive influence of MAT on QoL. Other factors may contribute to these positive results. Some variables, such as age (Lofwall et al., 2005), gender (Haug et al., 2005), drug and alcohol use

(Deering et al., 2004, and comorbidity (O'Brien et al., 2006), may mediate individuals' QoL, illustrating multiple influencing factors that often make measuring QoL challenging. What is supported in the literature is that other aspects in life- emotional, social, and physical status, may have significant impact on QoL, which necessitates looking beyond abstinence-oriented treatment goals. Moreover, most studies that have reported on potential determinants of QoL were correlational, so further research is needed to investigate the direction of this association in multivariate analyses and to explore the differential effectiveness of MAT, in which a broad view to QoL is applied rather than one that is limited to abstinence.

Why Should Quality of Life Have a Prominent Role in Addiction Research?

The chronic nature of drug use problems makes it necessary to look at outcomes of drug treatment from a broad perspective based on patients' needs and focusing on continuity of care rather than on acute interventions (O'Brien & McLellan, 1996). Most outcome studies have been oriented towards recovery and termination of use rather than on a continuing care perspective (McLellan, 2002; Vanderplasschen et al., 2004). However, Stark and Campbell (1991) have shown that one of the most important reasons given by methadone patients for following treatment recommendations was to improve their satisfaction with life. Drug use is not always the reason why people seek treatment, but rather they do so because of problems in other life domains, such as legal or social (Gerstein & Harwood, 1990; Laudet, 2011, Rounsaville & Kleber, 1985). Moreover, few studies have found a direct link between the use of illegal drugs and poor QoL. Measuring QoL can broaden our view and provide new insights beyond the direct consequences of substance use disorders about aspects of life that really matter to patients apart from their physical and mental health state. Drug users do not primarily associate QoL with health, but rather with social inclusion and self-determination (De Maeyer, Vanderplasschen, &

Broekaert, 2009). Consequently, it will be necessary to research this population and treatment modality from a holistic paradigm when talking about QoL, giving attention to the individual as a whole in interaction with his or her environment (Brown, Renwick, & Nagler, 1996; Laudet, Becker, & White, 2009).

The concept of QoL has gradually become an important outcome measure in health research (Katschnig, 2006), but the application of this concept in clinical practice is still limited (Bonomi et al., 2000; Connor, Saunders, & Feeney, 2006). Although QoL has become a popular clinical term to demonstrate the multidimensional approach of treatment based on patients' needs, in reality the concept often turns into idle talk. Assessing the QoL of drug users in practice is both feasible and useful and can offer additional diagnostic information providing a total picture of the patient to tailor clinical practice that is more suited to patients' needs (Laudet et al., 2009).

Gaps in the Research

There has been a dearth of research related to QoL outcomes in addiction treatment apart from MAT (White, 2015c). As such, the existing research body is limited in the conclusions that can be drawn related to QoL outcomes. Most QoL studies tend to evaluate outcomes over short periods of time. Twenty-three of the 43 studies reviewed for this dissertation were cross-sectional in design, measuring the individual QoL at only one point in time. This type of study does not give the reviewer an understanding of the longitudinal benefit of MAT in relation to QoL outcomes. Twenty-one of the studies were longitudinal in design, the longest being 36 months (Giacomuzzi et al., 2005). Four of the studies reviewed 12 month QoL outcomes (Dazord et al., 1998; Habret et al., 2002; Karow et al., 2011; Torrens et al., 1997) and the remaining QoL outcomes at 9 or less months (Baharom, Hassan, Ali & Shah, 2012; Giacomuzzi

et al., 2003, 2005; Korbra et al., 2012; Lawrinson et al., 2008; March et al., 2006; Maremmani et al., 2007; Mitchell et al, 2015; Padaiga et al., 2007; Ponizovsky & Grinshpoon, 2007; Reno & Aiken, 1993; Vignau & Brunelle, 1998; Villeneuve et al., 2006; Winklbaur et al., 2008). Despite the longitudinal design, the studies did not yield anything more than a verification of improved overall QoL at 3, 6, and 12 months of measurement (De Maeyer et al., 2010).

Additionally, none of the studies resulted in unequivocal findings about the determinants that are associated with QoL. An inverse relationship between age and HRQoL was shown in various studies (Deering et al., 2004; Lofwall et al., 2005; Millson et al., 2006), while inconsistent findings were reported regarding the role of gender (Deering et al., 2004; Habrat et al., 2002; Haug, Sorensen, Lollo, Gruber, Delucchi, & Hall, 2006; Millson et al., 2006; Ryan & White, 1996). The impact of severity of a severe SUD on HRQoL remains unclear (Astals et al., 2008; Karow et al., 2008; Millson et al., 2006; Puigdollers et al., 2004; Ryan & White, 1996). Emotional and psychiatric problems, depression, and personality disorders appear to have a detrimental impact on individuals' HRQoL (Carpentier, Krabbe, Van Gogh, Knapen, Buitelaar, & De Jong, 2009; Batki, Canfield, Smyth, & Ploutz-Snyder, 2009; Millson et al., 2006). Social support may have a positive influence on HRQoL (Préau et al., 2007), but conflicts with family and partner have been associated with lower HRQoL scores (Karow et al., 2008). As demonstrated by Millson and colleagues (2006), who identified more than a dozen different determinants of the mental and physical composite scores of the SF-36, opioid-dependent individuals' HRQoL is affected by multiple factors. A better understanding of determinants that are associated with high QoL scores may advise treatment service providers on how they can improve individuals' QoL (Carr et al., 2001).

Moreover, most studies have taken place outside the United States. Only six of the studies included participants receiving MAT in the United States (Haug et al., 2005; Hser, 2007; Lofwall et al., 2005; Mitchell et al., 2015; Reno & Aiken, 1993; Rosen, Smith, & Reynolds, 2007). This might be the result of the lack of funding for QoL research and the stigma associated with MAT (White, 2015c).

Lastly, many of the studies reviewed used HRQoL and QoL interchangeably. Many studies where the intent is to understand the participants' subjective QoL use an HRQoL survey, such as the SF-36. According to Cummins, Lau, & Stokes (2004), these researchers are using the wrong construct and survey if the focus was subjective QoL. The narrow perspective of an HRQoL survey is that it lacks attention to the complexity of drug users' lives and limits it to health-related issues. Clearly, other aspects that have a profound impact on the subjective well-being of individuals such as self-esteem, life goals, and social participation, also need to be incorporated. The utilization of a QoL specific survey will help to better understand the improvements that are occurring and what is influencing those changes (De Maeyer, et al., 2009).

Given the dearth of research on QoL outcomes and the predictors of QoL among individuals with opioid use disorder in the United States, and given the assumption that medication-assisted treatment contributes to the improvement of opioid users' overall well-being, the purpose of this research is to study the QoL of persons who have been receiving in medication assisted treatment over the last five years. Additionally, the specific demographic, psychosocial, drug, and health-related variables that are independent predictors of a better QoL are also explored.

Methodology

Introduction

Only recently has Quality of Life (QoL) become an outcome measure in research on the effectiveness of opioid medication-assisted treatment (MAT) (Amato et al. 2005; Maremmani, Pani, Pacini, & Perugi, 2007; Padaiga, Subata, & Vanagas, 2007; Winklbaur, Jagsch, Ebner, Thau, & Fischer, 2008). However, the existing body of research focuses on the acute, early treatment period of Medication-Assisted Treatment (MAT) rather than a long course of maintenance treatment (De Maeyer et al., 2009). Given the dearth of research on the long-term sustainability of QoL among patients receiving MAT and given the assumption that it contributes to the improvement of opioid users' overall QoL and psychosocial functioning, the aim of this research is to gain an understanding of the QoL of persons enrolled in an Opioid Treatment Program (OTP) and receiving MAT over a four-year period. Furthermore, the question of which demographic, psychosocial, drug, and health-related variables are independent predictors of a better QoL is explored.

The following research questions guide this study:

RQ1: To what extent did six dimensions of the patients' QoL (i.e., Physical State, Mental/Emotional State, Stress Evaluation, Life Enjoyment, Overall Quality of Life, and Overall Impressions) measured with the Health, Wellness, and Quality of Life Questionnaire, change over time while they were receiving MAT?

RQ2: To what extent were the changes in the patients' QoL over time measured with the Health, Wellness, and Quality of Life Questionnaire while they were receiving MAT associated with the patients' (a) mental health characteristics (i.e., anxiety and depression); (b) physical health characteristics (i.e., high blood pressure, diabetes, COPD/emphysema, and hepatitis C);

(c) domestic/family violence and child abuse; (d) severity of substance use at admission; (e) current substance use; and (d) current withdrawal symptoms.

Research Design

This is a quantitative longitudinal study of adult patients enrolled in two outpatient OTPs located in Texas receiving medication-assisted treatment for opioid use disorder. The study includes analysis of patient psychosocial and demographic information collected at the time of the patient's initial enrollment in the program and analysis of QoL assessments collected from patients annually in 2013, 2015, 2016, and 2017.

The setting:

The study utilized secondary data from two outpatient OTPs located in East Texas. Both programs deploy the same program design that includes the use of methadone and buprenorphine in the treatment of opioid use disorder. The clinics were chosen because they are similar in structure, staffing, and patient demographics to other clinics in Texas and to other clinics throughout the United States. Nationally, all OTPs are governed by federal regulations that dictate minimum operational and clinical standards and services. In addition, all OTPs are required to be accredited by a national accreditation body such as The Joint Commission and The Commission on Accreditation of Rehabilitation Facilities as a way of ensuring uniform service standards across the entire industry.

The Methadone Clinic of East Texas (MCET) has two locations, one located in Tyler, Texas and one located in Waskom, Texas. MCET services adult males and females who are addicted to opioids and reside in Texas, Oklahoma, Arkansas, and Louisiana. MCET receives a mix of funding that includes private pay, commercial insurance, Medicaid, and federal block grant funds. In both clinic locations, the treatment model includes the provision of medication

(methadone and buprenorphine) in combination with behavioral therapies. The majority of patients (98%) are prescribed methadone. Patients are mandated to receive a minimum of four hours of behavioral therapy services per month. Behavioral therapy services include individual counseling and psychoeducation groups provided by licensed chemical dependency counselors. Counseling and groups are focused on the patient's substance use and the circumstance by which they use opioids and methods by which they can abstain from using illicit or non-prescribed opioids. Counselors are required to have at least one year of addiction treatment experience and to receive 30 hours of medication-assisted treatment-related training each year. The type and dosage of medication is determined by a licensed physician with at least two years of experience in addiction treatment and who has received at least 30 hours of training/education related to treating opioid use disorders with methadone or buprenorphine.

Sampling Techniques and Sample

The study sample included adult males and females who received treatment at one of the two study sites between January 2013 and May 2017. To be eligible for treatment, individuals met the DSM-V diagnosis for a severe or moderate opioid use disorder, had been actively using opioid for at least one year prior to admission, and were exhibiting acute opioid withdrawal symptoms, as measured by the Clinical Opioid Withdrawal Scale (COWS) on the day of admission.

At the time of data collection, the clinics were estimated to have a total of approximately 300 patients who had completed QoL questionnaires between 2013 and 2017 and whose admission and ongoing psychosocial assessments could be obtained for the allocated study duration. All individuals who were receiving MAT services at times when the QoL questionnaire was administered by the clinic were asked to complete a questionnaire.

To determine the minimum sample size required, an *a priori* power analysis was conducted using G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007). The input parameters were (a) a statistical power of 0.8 (i.e., an 80% probability of not committing a Type II error); (b) a clinically significant effect size ($R^2 = 0.25$, meaning that 25% of the variance in the dependent variable is explained); (c) a conventional statistical significance level ($\alpha = .05$) with four repeated measures and three groups. It was determined that the minimum sample size needed for the specified time period of the longitudinal study, with no patients dropping out, was 102 patients.

The final sample consisted of 102 participants and the individuals who completed QoL questionnaires between 2013 and 2017, and those patients received MAT at a rural outpatient addiction treatment center as well. The majority of participants were receiving methadone and had been in treatment for longer than a year. All but a few of the participants met the criteria for a severe opioid use disorder, many attempting treatment multiple times in both MAT and abstinence-based treatments. The majority of participants reported using synthetic opiates as their primary drug of choice at admission, with hydrocodone being used the most. On average, the individuals completing questionnaires tended to be Anglo men or women who were employed, but impoverished and married or cohabitating with children. A full demographic profile of the participants is presented in Chapter 4.

Procedures

Patients who are enrolled in the clinic must meet the federally mandated admission criteria. To determine appropriateness for admission, a complete drug use history is obtained by the admission counselor, nurse, and physician. In addition to the substance use history, a urine drug screening is competed to confirm current opioid use. Once it is determined that the patient

meets the federally defined eligibility criteria and is approved for admission by the physician, the patient is given the series of physical and psychosocial assessments by the nurse, physician, and clinician. These assessments are conducted over a 30-day period and include a physical exam, CBC blood testing, urinalysis, communicable disease testing, psychiatric assessment, psychosocial assessment, COWS, and comprehensive health history. The assessments are recorded in the medical record. The information obtained is compiled at three different points during the 30-day period. When the patient first presents requesting treatment, they are required to complete biographical data and demographic information. The patient will then meet with the admissions nurse, who gathers the comprehensive health assessment, completes the COWS, collects urine and blood for testing, and administers a TB skin test. The patient will meet with a counselor who gathers the substance use history. This information is synthesized and reported to the physician who interviews the patient and prescribes an initial treatment protocol that includes medication and therapy. The patient is then scheduled to meet with the physician within 7 days for a physical examination and comprehensive psychiatric assessment. This allows time for all lab results to be returned and evaluated and for the patient's acute withdrawal symptoms to improve so that the physician can better assess the patient's physical and mental health. Over the next several weeks, the patient meets regularly with the counselor who assesses the severity of addiction and gathers psychosocial functioning information using the Addiction Severity Index (ASI) assessment. The patient attends the clinic daily for the first 45 days of treatment and is assessed daily for acute withdrawal symptoms using the COWS. The medication dosage is increased until the patient reports minimal or no withdrawal symptoms. Once the patient is stabilized and fully assessed, the behavioral therapy component of treatment begins.

For the first year of treatment, patients attend the clinic at least four times per week and are required to participate in weekly counseling. Patients also meet with the nurse as needed to evaluate the effectiveness of the medication and to assess for withdrawal symptoms. In addition, patients who test positive for a communicable disease are referred to collaborating health programs for additional services. Patients with identified co-occurring psychiatric conditions are referred to mental health professionals in the community. Pregnant patients receive specialized services through collaboration in the community. As part of the counseling services, patients are educated about the importance of remaining in treatment for at least one year. Most patients will receive medication for an indefinite period of time. The average length of treatment for the participants in this study is 6 years.

Assessment of the patient's medical status and psychosocial functioning is evaluated on an ongoing basis, as described above. In addition, as part of the quality management and program evaluation process, the program distributes a Health, Wellness, and Quality of Life questionnaire that all patients are required to complete and return. The questionnaire is gathered by the program sponsor and entered into a Survey Monkey survey where it is used by the program for general program evaluation purposes. Approximately 86% of all patients receiving treatment completed and returned the questionnaire as required. The questionnaires are maintained in Survey Monkey and in paper format for a period of 10 years.

Permission was obtained from the program to utilize the de-identified initial psychosocial and demographic information of current patients who have actively received treatment since January 2013 as well as the de-identified QoL questionnaires collected beginning in January 2013 and ending in May 2017. The psychosocial data were delivered in the form of a CSV

document that was generated from the program electronic health record. The QoL questionnaire data were delivered in the form of CSV documents generated from Survey Monkey.

Measures and Instrumentation

The Health, Wellness, and Quality of Life Questionnaire has been used by the program to collect QoL outcomes since 2013 at both clinics. It is a 60-item questionnaire in which patients rate their physical health, mental and emotional health, stress, life enjoyment, and overall QoL (see Appendix A). Table 3.1 defines the six dimensions, domains, or subscales that could potentially be operationalized from the 60 items of quantitative response data collected using the Health, Wellness, and Quality of Life Questionnaire.

Table 3.1

Definitions of Six Dimensions of the Health, Wellness, and Quality of Life Questionnaire

Dimension	Conceptual definition	Number of items	Item response format	Operational definition
Overall Quality of Life	Feelings relative to the quality of life experienced, associated with personal life, significant other, romantic life, job, co-workers, actual work done, handling problems in life, accomplishments, physical appearance, self, adjustments to changes in life, life as a whole, contentment with life, extent to which life has been what was wanted	14	7-point rating scale for each item where: 1 = *terrible* to 7 = *delighted*	Average of the scores for 14 items. Minimum score = 1. Maximum score = 7. Higher scores imply a higher overall quality of life.
Life enjoyment	Level of experience of enjoyment associated with inner voice/feelings, relaxation, positive feeling about self, health lifestyle, connection to others, sexual relations,	14	5-point rating scale for each item where: 1 = *not at all* to 5 = *extensive*	Average of the scores for 14 items. Minimum score = 1. Maximum score = 5. Higher scores imply a higher level of life enjoyment.

	confidence in dealing with adversity, compassion and acceptance of others, recreation, and leisure pursuits			
Mental/ Emotional State	Frequencies of emotional distress associated with physical pain, negative feelings, moodiness/temper outbursts, depression, worry, difficulties thinking or indecisiveness, fear/anxiety, restlessness, sleep disturbance, and recurring thoughts	10	5-point rating scale for each item, where: 1 = *ne*ver to 5 = c*onstantly*	Average of the scores for 10 items. Minimum score = 1. Maximum score = 5. Higher scores imply a poorer mental/emotional state.
Physical State	Frequencies of physical pain, tension, low energy, illness, headaches, nausea, allergies, menstrual discomfort, dizziness, and accidents	10	5-point rating scale for each item where: 1 = *never* to 5 = *constantly*	Average of the scores for 10 items. Minimum score = 1. Maximum score = 5. Higher scores imply a poorer physical state.
Stress Evaluation	Level of psychological stress associated with family, relationships, health, finances, sex life, work, school, general well-being, and coping with daily problems	10	5-point rating scale for each item where: 1 = *no stress* to 5 = *extreme stress*	Average of the scores for 10 items. Minimum score = 1. Maximum score = 5. Higher scores imply a higher level of stress.
Overall Impressions	Current quality of life associated with physical well-being, mental/emotional state, ability to handle stress, and enjoyment of life, compared to when the patient first entered treatment	5	3-point rating scale for each item, where 1 = *better*; 2 = *somewhat better*; 3 = *worst*	Average of the scores for 5 items. Minimum score = 1. Maximum score = 3. Higher scores imply a decrease in quality of life compared to when the patient first entered treatment.

The Health, Wellness, and Quality of Life Questionnaire is not a published or validated instrument and as such, validation was required as part of this study. The validation process is described below in the Data Analysis Procedures.

Socio-demographic information was collected from the Clinical Management for Behavioral Health Services (CMBHS) Comprehensive Assessment that is administered at these treatment centers. The CMBHS instrument collects age, sex, marital status, employment status, legal status, education, substance(s) used, length of substance(s) use, number of treatment episodes, age of first use, frequency of use, and admission date (length of time in treatment). The questions cover health and medical issues, educational attainment, employment and support, legal matters, living situation, family and social issues, psychiatric as well as psychological problems, substance use, diagnostic, and counsel or problem severity ratings. The CMBHS comprehensive assessment has not been validated; however, when comparing the structure, questions, and format of the CMBHS Comprehensive Assessment to the Addiction Severity Index (ASI), it appears to be similar in order and structure. The CMBHS Comprehensive Assessment has many more questions than the ASI, though all the ASI questions are in the CMBHS Comprehensive Assessment. It appears that the CMBHS Assessment may be an expanded version of the ASI, and modified versions of the ASI have proven to be reliable in various settings for many years (McLellan, Luborsky, Woody, & O'Brien, 1980). Table 3.2 defines the psychosocial items collection from the CMBHS Assessment.

Table 3.2

Definitions of CMBHS Assessment Psychosocial Stressors

Category	Variable	Scoring	Operational Definition
General Demographic	1. What is your age?	Number 0+	Age in years at admission

2.	What is your gender?	Male/Female	Biological sex of respondent
3.	What is your marital status?	Cohabitating/Married/Single/Divorced/Widowed	Marital status at admission
4.	How many children are in your home?	Number 0+	Number of dependent children residing in home at admission
5.	What is your monthly income?	Number 0+	Amount of monthly income in dollars
6.	Do you receive disability payments (SSI, SSDI, VA)?	Yes/No	Did respondent receive social security disability, supplemental security income, or veteran's disability income at time of admission?
7.	Do you receive public assistance (TANF, SNAP, Medicaid)?	Yes/No	Did respondent receive Texas public assistance in the form of cash, food stamps, or Medicaid at time of admission?
8.	What is your current living situation?	Homeless/in own home/with family and friends	At time admission what was the respondent's physical living environment: homeless, in own home, with family and/or friends?

Comorbid Medical Conditions	1. What is your current medical situation? High Blood Pressure	None/mild/moderate/severe	Did the respondent have the identified physical ailment and if so what was the severity at 30 days post admission? None indicates not present. Mild/moderate/ severe indicates increasing severity of physical ailment.
	2. What is your current medical situation? Diabetes	None/mild/moderate/severe	
	3. What is your current medical situation? COPD/ Emphysema	None/mild/moderate/severe	
	4. What is your current medical situation? Hepatitis C	None/mild/moderate/severe	
	5. What is your current medical situation? HIV	None/mild/moderate/severe	
Comorbid Psychiatric Conditions	1. What is your current mental health situation? Depression	None/mild/moderate/severe	Is the respondent experiencing a psychiatric condition and if so what was the severity at 30 days post admission?

			None indicates not present. Mild/moderate/ severe indicates increasing severity of psychiatric distress.
	2. What is your current mental health situation? Anxiety	None/mild/moderate/severe	
Comorbid Substance Use	1. What is your substance use situation? Having withdrawal symptoms from opiate use.	None/mild/moderate/severe	Was the respondent having acute opioid withdrawal symptoms and if so what was the severity at 30 days post admission? None indicates not present. Mild/moderate/ severe indicates increasing severity of physical ailment.
	2. What is your substance use situation? Non-prescribed opiate use.	None/mild/moderate/severe	Is the respondent using other substances at admission and if so what was the severity at 30 days post admission? None indicates not present. Mild/moderate/ severe indicates

			increasing severity of illicit substance use.
	3. What is your substance use situation? Alcohol.	None/mild/moderate/severe	
	4. What is your substance use situation? Marijuana.	None/mild/moderate/severe	
	5. What is your substance use situation? Cocaine.	None/mild/moderate/severe	
	6. What is your substance use situation? Benzodiaze-pines.	None/mild/moderate/severe	
Substance Use Severity	1. How often did you use opioids?	Once a month/few times a week/once a day/several times a day	At admission how often was the respondent using opioids?
Physical Abuse	1. Had you been in a physically abusive relationship in your adult life?	Yes/No	At admission had the respondent ever been in a relationship where physical abuse was present? Did not ask who the aggressor was?
	2. Had you been physically abused as a child?	Yes/No	Was the respondent physically abused as a child?

Normative Substance Use by Family	1. Did you grow up or live in an environment as a child where substance use was the norm?	Yes/No	Was the respondent exposed to a substance using culture in childhood?
	2. Have any of the following people in your life also been addicted to opiates?	None/parents/siblings/other relatives/close family members	At admission was there exposure to opioid using relatives? Did not differentiate if current or past addiction.

Current substance use is determined by monthly urine analysis that is submitted to the lab for testing and the results are reported to the program and recorded in the medical record. Tests that are determined to be positive for illicit substances are retested and confirmed by the laboratory.

Data Collection and Management Process

All demographic information was collected by the counseling staff and recorded in a secure electronic health record, Clinical Management for Behavioral Health Services (CMBHS). This site is operated and maintained by the Texas Department of State Health Services and is available to clinics that provide block grant funded treatment services. Users are given access based on job roles and functions. The clinics use CMBHS as their primary medical record and maintain all patients' clinical information in CMBHS. The clinic is able to create de-identified data reports from clinical information collected and recorded in CMBHS.

Program staff recorded urine analysis results in the medical record and provided a de-identified report of urine testing results for each year beginning in January 2013 and ending in May 2017. The QoL questionnaires are collected annually. The written questionnaire was completed by the patients, returned to the receptionist, and entered into Survey Monkey by data entry staff. The data was reviewed by a second person to ensure that the questionnaires were correctly entered. Questionnaires were entered as they were completed. Questions that were not answered were left blank, as were the questions with multiple answers. The Survey Monkey account is password protected and only the clinical director and owner have access to the information. The program is able to download de-identified questionnaire responses in CSV format.

Data Analysis Procedures and Strategies for Interpretation

The data were received in Microsoft Excel format as raw data entered into CMBHS and Survey Monkey. The data were imported into the data editor of SPSS. The first stage of the data analysis in SPSS was to screen for missing values. All patients who did not provide a full set of answers to the Health, Wellness, and Quality of Life Questionnaire administered between 2013 and 2017 were excluded from the analysis. The second stage of the analysis was to validate the Health, Wellness, and Quality of Life Questionnaire using principal components factor analysis with Varimax rotation and Keiser normalization (Field, 2013). Factor analysis is a data reduction technique that reduces a large data matrix into a smaller number of dimensions. It was expected that factor analysis would show that the 60 items could be condensed into the six dimensions defined in Table 3.1, validating the use of the Health, Wellness, and Quality of Life Questionnaire. Furthermore, the internal consistency and reliability of the six subscales was evaluated using Cronbach's alpha. Following the common convention, values of Cronbach's

alpha > .7 were assumed to indicate a reliably measured subscale based on multiple items (Tavakol & Dennick, 2011).

The third stage of the analysis was to summarize the demographic and psychosocial characteristics of the sample and were summarized using descriptive statistics (e.g., mean and standard deviation) for the interval level variables and frequency distributions (e.g., counts and percentages) for the categorical variables.

The psychosocial and socio-demographic information at admission to the MAT were missing for 7 of the 102 participants (5.9%) who provided four successive sets of completed response data for the Health, Wellness, and Quality of Life Questionnaire. As such, the description of the psychosocial and socio-demographic characteristics of the participants applied to 95 of the 102 patients (93.1%) who completed the Health, Wellness, and Quality of Life Questionnaire. The percentage data for each category, therefore, do not add up to 100%.
The final state of the analysis was to address the following two research questions:

RQ1: To what extent did six dimensions of the patients' QoL (i.e., Overall QoL, Physical State, Mental/ Emotional State, Stress Evaluation, Life Enjoyment, and Overall Impressions) measured with the Health, Wellness, and Quality of Life Questionnaire change over time while they were receiving MAT?

RQ2: To what extent were the changes in the patients' quality of life over time measured with the Health, Wellness, and Quality of Life Questionnaire while they were receiving MAT associated with the patients' (a) mental health characteristics (i.e., anxiety and depression); (b) physical health characteristics (i.e., high blood pressure, diabetes, COPD/emphysema, and hepatitis C); (c) domestic/family violence and child abuse; (d) severity of substance use at admission; (e) current substance use; and (d) current withdrawal symptoms.

The six dependent variables measured with the Health, Wellness, and Quality of Life Questionnaire are all repeated measures because they were collected on four occasions between 2013 and 2017. However, all the patients had different times (months) in treatment, which acted as a covariate (i.e., an external variable that interferes with the dependent variable). Consequently, the method of statistical analysis that was most appropriate to address RQ1 and RQ2 was repeated measures Analysis of Covariance (ANCOVA). The use of repeated measures ANCOVA was based on the following assumptions (Field, 2013): (a) Multiple observations of the dependent variable were collected repetitively from the same participants over a fixed period of time from a baseline to an endpoint; (b) None of the participants dropped out between the baseline and the endpoint (i.e., there must not be any missing values, so that the sample size remained entirely constant throughout the whole of the study); (c) The repeated measures were collected on two or more occasions, such that each successive measure was dependent on (i.e., correlated with) one or more of the previous measures; (d) The covariate was correlated with the dependent variable; (e) The residuals (the differences between the mean values and the measured values) were theoretically normally distributed with a mean of zero; however, ANCOVA is relatively robust with respect to deviations from residual normality (Glass, Peckham, & Sanders, 1972; Lix, Keselman, & Keselman, 1996). The variances of the differences between the dependent variables at each successive interval of time should be equal. This is known as sphericity and is indicated if $p < .05$ for Mauchly's test for sphericity.

The within-subject effects associated with variations over time and the between-subject effects associated with the psychosocial stressors were tested for statistical significance using *F* test statistics. Statistical significance was indicated if $p < .05$. The effect sizes (η^2) were also computed to determine clinical significance. The interpretation of the effect sizes was as follows:

η^2 = .04 = low clinical significance; .25 = moderate clinical significance; and .64 = strong clinical significance (Ferguson, 2009). The dimensions with the highest effect sizes were the ones that changed the most with opioid medication. The domains with the lowest effect sizes were the ones that changed the least with opioid medication.

Additionally, using the short-term change scores between the baseline and the first assessment, the short-term change scores were computed as the first assessment scores collected in 2015 minus the baseline scores collected in 2013, and was done to evaluate short-term improvements in QoL. Consequently, a positive change score represented an increase over time, a negative score represented a decrease over time, and a change score of zero represented no change over time. Paired *t*-tests were conducted to determine if the change scores were significantly different from zero.

Lastly, the SPSS data file, N=102, was utilized to conduct a frequency analysis using the mean scores and the output with a line graph displaying the overall QoL of each patient vs. time.

Preparation of Data

The files received from the CMBHS required considerable manipulation before the data were suitable for statistical analysis. Two MS Excel files containing the secondary data were received, specifically the de-identified initial psychosocial and demographic information of current patients who actively received treatment since January 2013, as well as all the responses to the de-identified Health, Wellness, and Quality of Life Questionnaire collected beginning in January 2013 and ending in May 2017. Both files were imported into the data editor of IBM SPSS vs. 25.0. The original questionnaire file contained a total of 1,034 records. The “Identify Duplicate Cases,” “Sort within matching groups by patient number,” and “Sequential count of matching cases in each group” procedures were applied to screen the questionnaire data file.

These procedures identified a total of 102 patients who had provided four complete sets of questionnaire data, with no missing values, in 2013, 2015, 2016, and 2017, respectively. The records for each of these patients were sequentially numbered 1, 2, 3, and 4, respectively, giving a total of 404 records (i.e., 404/1,034 = 39.1% of the records extracted from the original file). The questionnaire file was subsequently cleaned by deleting all records for those patients who did not provide four complete sets of questionnaire data.

The four complete sets of data for the 102 patients were aligned vertically in the file; however, this was not the correct format for conducting statistical analysis in SPSS. To generate the correct format required for statistical analysis using repeated measures ANOVA, and thereby compare the Health, Wellness, and Quality of Life Questionnaire response data between 2013, 2015, 2016, and 2017, the vertically aligned data were transposed horizontally into four sets of columns.

Finally, the file containing the psychosocial and demographic data for each patient reported by the Clinical Management for Behavioral Health Services (CMBHS) Comprehensive Assessment was merged with the file containing the response data for the Health, Wellness, and Quality of Life Questionnaire. As the unique patient ID numbers in the two files were coded identically, the researcher was able to horizontally align the rows of data in the merged file such that the psychological and demographic data for each numbered patient were linked to the questionnaire data for each patient coded with the same ID number.

Chapter 4 presents the results of the analysis described above.

Results

Introduction

The statistical results of this dissertation are presented in six sections. The first section summarizes the psychosocial and socio-demographic characteristics of participants. The second section presents the results of principal components analysis and reliability analysis to validate the six dimensions of the Health, Wellness, and Quality of Life Questionnaire (specifically 1 = Overall Quality of Life; 2 = Life Enjoyment; 3 = Mental/Emotional State; 4 = Physical State; 5 = Stress Evaluation, and 6 = Overall Impressions). The third section presents the descriptive statistics for the six dimensions of Quality of Life (QoL). The next two sections present the statistical evidence to address the following two research questions:

RQ1: To what extent did the six dimensions of the patients' QoL (i.e., Overall QoL, Physical State; Mental/ Emotional State; Stress Evaluation; Life Enjoyment; and Overall Impressions) measured with the Health, Wellness, and Quality of Life Questionnaire, change over time while they were receiving MAT?

RQ2: To what extent were the changes in the patients' quality of life over time measured with the Health, Wellness, and Quality of Life Questionnaire while they were receiving MAT associated with the patients' (a) mental health characteristics (i.e., anxiety and depression); (b) physical health characteristics (i.e., high blood pressure; diabetes; COPD/emphysema; and hepatitis C); (c) domestic/family violence and child abuse; (d) severity of substance use at admission; (e) current substance use; and (d) current withdrawal symptoms.

The final section presents a summary of the results, including concise answers to the research questions.

Limited research has been conducted to evaluate the long-term sustainability of the QoL among patients with severe opioid use receiving medication-assisted treatment (MAT). The aim

of the current research was to improve understanding of the QoL and psychosocial functioning of persons enrolled in an Opioid Treatment Program (OTP) and receiving MAT over a four-year period. Furthermore, the potential independent predictors of improved QoL were examined, including demographic, psychosocial, drug, and health-related variables.

Psychosocial and Demographic Characteristics of Participants

The psychosocial and socio-demographic information at admission to the MAT were missing for 6 of the 102 (5.9%) participants who provided four successive sets of completed response data for the Health, Wellness, and Quality of Life Questionnaire. The following description of the psychosocial and socio-demographic characteristics of the participants therefore applied only to 95 of the 102 patients (93.1%) who completed the Health, Wellness, and Quality of Life Questionnaire. The percentage data for each category, therefore, do not add up to 100%.

Table 4.1 shows that over half of the participants were female. Their ages ranged very widely from 23 to 91 years old, but the majority were between 31 and 50 years old. Most of the participants were married or cohabiting, lived in their own home and had children and their monthly income ranged from zero to over $5000 per month. Over half had zero income or earned a low income of less than $1000 per month. Some of the participants received disability income (e.g., SSI, SSDI, or VA) and some received public assistance (e.g., TANF, Medicaid, or SNAP).

Table 4.1

Socio-demographic Characteristics of Participants at Admission

Characteristic	Category	*n*	%
Gender	Female	55	54.5
	Male	40	39.6
Age (Years)	21–30	9	8.9
	31–40	33	32.7
	41–50	24	23.8
	51–60	18	17.8
	61–70	9	8.9
	>70	2	2.0
Marital Status	Married/Cohabiting	52	51.5
	Divorced	21	20.8
	Single	18	17.8
	Widowed	4	4.0
Current living situation	Independent, in own home	83	82.2
	Living with family or friends	12	11.9
Have children	Yes	51	56.4
Monthly income ($)	0	23	22.8
	100 – 1000	29	28.7
	1001–2000	17	16.8
	2001–3000	12	11.9
	3001–4000	2	2.0
	4001–5000	7	6.9
	>5000	5	5.0
Receive disability income	Yes	20	19.8
Receive public assistance	Yes	34	33.7

Table 4.2 reflects chronic mental and physical health conditions believed to influence substance use (Lawrinson et al., 2008; Mitchell et al., 2015; Puigdollers et al., 2004) as well as

having an influence on a person's subjective QoL (Banarom et al., 2012; Fei et al., 2016; Kobra et al., 2012; Mitchell et al., 2015). At admission, many of the participants reported experiencing psychiatric distress, primarily anxiety (*n* = 49, 48.5%) and/or depression (*n* = 37, 36.6%). Additionally, many also reported one or more chronic health conditions such as high blood pressure (*n* = 29, 28.7%); diabetes (*n* = 15, 14.9%); COPD/emphysema (*n* = 10, 9.9%); and hepatitis C (*n* = 5, 5.0%).

Table 4.2

Mental and Physical Health Characteristics of Participants at Admission

Characteristic	*n*	%
Anxiety	49	48.5
Depression	37	36.6
High blood pressure	29	28.7
Diabetes	15	14.9
COPD/Emphysema	10	9.9
Hepatitis C	5	5.0
HIV	0	0.0

Another frequently reported influence on substance use and QoL is trauma (Karow et al., 2008; Millson et al., 2006). Many of the participants have been in a physically abusive relationship in adult life and/or were physically abused as a child. Additionally, childhood exposure to substance use and having an opioid addicted family member also occurred in large numbers.

Table 4.3

Physical Abuse Characteristics of Participants at Admission

Characteristic	*n*	%
Physically abused as an adult	35	36.8
Physically abused as a child	24	23.8

Table 4.4

Childhood Exposure to Substance Use and Family Opioid Addiction

Characteristic	*n*	%
Substance use in home as a child	30	29.7
Family member addicted to opioid as a child		
Parent	26	25.7
Other close family member	9	8.9
Family member addicted to opioid as adult		
Sibling	10	9.9
Spouse	15	14.9

Pre-admission type and severity of opioid use, as well as continued substance use during MAT, may also have a detrimental impact of QoL (Deering et al., 2004). Table 4.5 shows that the majority of the participants (*n* = 80, 79.2%) used opioids several times a day at admission.

Table 4.5

Substance Abuse Situation of Participants at Admission

Characteristic	Category	*n*	%
Frequency of use of opioids	Several times a day	80	79.2
	Once a day	13	12.9
	Few times a week	1	1.0
	Once a month	1	1.0

A number of participants reported ongoing and continued withdrawal symptoms 30 days post admission. Despite experiencing withdrawal symptoms, generally, few of the participants reported concurrent drug and/or alcohol use. Those that did report comorbid substance use, alcohol and marijuana were the primary substances that patient continued to use, often concurrently. A small percentage of the participants continued to use non-prescribed opioids. All of the patients who reported using non-prescribed opioid also reported having withdrawal symptoms.

Table 4.6
Current Substance Abuse Situation of Participants at 30 Days Post Admission

Characteristic	*n*	%
Having withdrawal symptoms from opioid use	18	17.8
Alcohol	9	8.9
Marijuana	9	8.9
Benzodiazepine	6	5.9
Non-prescribed opioids	5	5.0
Cocaine	1	1.0
Alcohol and Marijuana concurrently	6	5.9
Persons w/ withdrawal symptoms using non-prescribed opioids	5	5.0

Figure 1 presents a frequency distribution histogram of the time that the participants were in treatment.

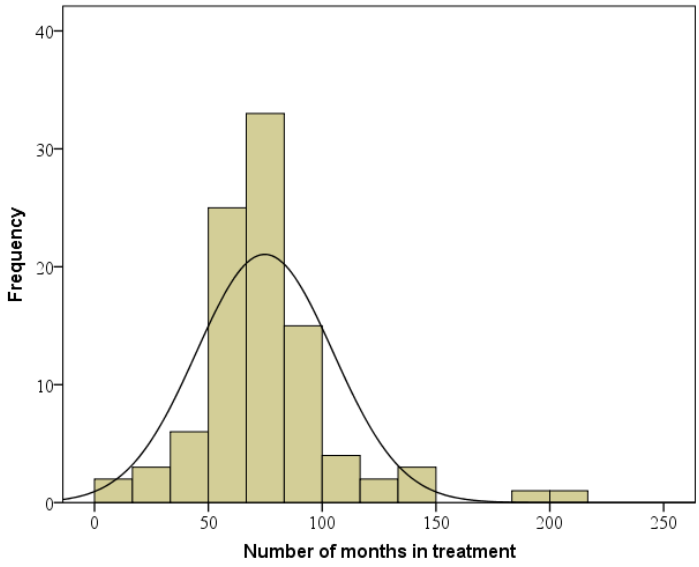


Figure 1 Frequency distribution of time in treatment

The mean number of years in MAT was 6.2 years (*M* = 74.78 months; *SD* = 30.00 months). Many of the participants had been receiving MAT for a period of time before the clinic began to collect Health, Wellness, and Quality of Life Questionnaires.

Validation of the Health, Wellness, and Quality of Life Questionnaire

The full set of quantitative response data to the Health, Wellness, and Quality of Life Questionnaire provided by $N = 102$ participants was analyzed by principal components factor analysis using Varimax rotation and Kaiser normalization. The rotation converged in seven iterations. Six dimensions were extracted from the item scores cumulatively explaining 62.0% of the variance. Table 4.6 presents the rotated component matrix, containing the factor loading coefficients for each item in the questionnaire. The questionnaire item scores were reduced into six dimensions, specifically 1 = Overall Quality of Life; 2 = Life Enjoyment; 3 = Mental/Emotional State; 4 = Physical State; 5 = Stress Evaluation, and 6 = Overall Impressions. With one exception, (i.e., "If pain is present, how distressed are you about it?") the factor loadings for each item that were clustered together to classify each of the six dimensions (highlighted in bold in Table 3.1) were consistently strong (> .5) reflecting good factorial validity. Apart from the one exception, the clusters of factor loadings for each item that were used to discriminate between the six dimensions were consistently greater than the cross-loadings for the same items across the five alternative dimensions. Analysis of the cross-loadings provided the evidence for good discriminant or divergent validity (i.e., the measurements that were not supposed to be related in fact were not related).

Table 4.8 presents the results of the reliability analysis. The internal consistency reliability of all the dimensions was found to be good to excellent (Cronbach's alpha = .835 to .963).

The statistical evidence based on principal components factor analysis and reliability analysis with Cronbach's alpha indicated that the six dimensions extracted from the 60 items in the Health, Wellness, and Quality of Life Questionnaire were valid and reliably measured.

Consequently, the researcher was justified to operationalize the six dimensions by averaging their constituent item scores (as previously defined in Table 3.1).

Table 4.7

Rotated Component Matrix of Factor Loading Coefficients for 60 Questionnaire Items

Questionnaire Item	Dimension					
	1	2	3	4	5	6
Your personal life	**.762**	.261	-.061	-.075	-.191	-.084
Your wife/husband or significant other	**.700**	.165	.075	-.080	-.258	-.114
Your romantic life	**.663**	.168	.098	-.115	-.308	-.167
Your job	**.757**	.119	-.168	-.027	-.074	-.047
Your co-workers	**.706**	.110	-.158	-.026	-.067	-.062
The actual work you do	**.771**	.127	-.115	-.057	.015	-.017
The handling of problems in your life	**.831**	.260	-.161	-.091	-.035	-.094
What you are accomplishing in your life	**.824**	.211	-.156	-.115	-.042	-.115
Your physical appearance	**.772**	.168	-.138	-.198	-.029	-.081
Yourself	**.826**	.235	-.172	-.118	-.097	-.085
Your ability to adjust to change in your life	**.792**	.260	-.128	-.065	-.076	-.103
Your life as a whole	**.846**	.256	-.152	-.102	-.130	-.084
Overall contentment with your life	**.847**	.259	-.120	-.085	-.136	-.101
The extent to which your life has been as you want	**.819**	.181	-.213	-.098	-.142	-.122
Openness to guidance to your "inner voice/feelings"	.108	**.626**	.072	.169	.120	-.044
Experience of relaxation or ease of well-being	.158	**.694**	-.047	.061	.034	-.033
Presence of positive feelings about yourself	.238	**.825**	-.115	-.003	-.069	-.038
Interest in maintaining a healthy lifestyle	.206	**.791**	-.042	-.036	.038	-.010
Open and aware/connected when relating to others	.204	**.848**	-.020	.038	.050	-.034
Level of confidence in ability to deal with adversity	.208	**.818**	-.043	.047	.003	-.010
Level of compassion for, and acceptance of, others	.092	**.799**	.110	.081	.061	-.047
Satisfaction with the level of recreation in your life	.248	**.823**	-.107	.013	-.007	.049
Incidence of feelings of joy or happiness	.244	**.859**	-.049	-.009	-.075	-.010
Level of satisfaction with your sex life	.211	**.662**	.154	-.104	-.132	.001
Time devoted to things you enjoy	.272	**.784**	-.036	-.011	-.058	.007
If pain is present, how distressed are you about it	-.067	.074	**.343**	.587	.182	.112
Presence of negative or critical feelings about yourself	-.189	-.108	**.636**	.318	.309	.083
Experience of moodiness or temper or angry outbursts	-.172	-.021	**.683**	.188	.138	.080
Experience of depression or lack of interest	-.199	-.082	**.721**	.248	.275	.137
Being overly worried about small things	-.158	-.036	**.672**	.228	.300	.033
Difficulty thinking or concentrating or indecisiveness	-.149	.004	**.790**	.207	.211	.072
Experience of vague fears or anxiety	-.143	-.015	**.733**	.267	.213	.031

Being fidgety or restless; difficulty sitting still	-.088	.012	**.777**	.102	.160	.090
Difficulty falling or staying asleep	-.102	.080	**.641**	.249	.141	-.007
Experience of recurring thoughts or dreams	-.068	-.048	**.515**	.252	.303	.076
Presence of physical pain	-.121	.176	.201	**.665**	.078	.086
Tension/stiffness/lack of flexibility in spine	-.081	.090	.134	**.700**	.062	.109
Incidence of fatigue or low energy	-.133	.025	.367	**.625**	.180	.166
Incidence of colds and flu	.009	-.026	.091	**.605**	.108	-.021
Incidence of headaches (or any kind)	-.087	.085	.152	**.591**	.060	-.028
Incidence of nausea or constipation	-.132	.011	.346	**.478**	.070	-.078
Incidence of menstrual discomfort	-.056	-.009	.206	**.312**	.041	-.118
Incidence of allergies or skin rashes	-.072	-.006	-.056	**.625**	.047	.059
Incidence of dizziness or light-headedness	-.070	-.049	.169	**.661**	.043	.036
Incidence of accidents or falling or tripping	-.073	-.040	.154	**.610**	.002	.108
Family	-.215	.004	.391	.074	**.534**	.119
Significant Relationship	-.171	-.005	.244	.032	**.589**	.068
Health	-.115	.015	.224	.449	**.569**	.044
Finances	-.232	.092	.278	.159	**.491**	.053
Sex Life	-.072	-.100	.056	.238	**.645**	.129
Work	-.115	.049	.199	-.115	**.566**	.098
School	.022	.087	.072	-.021	**.610**	.021
General well-being	-.149	-.019	.367	.319	**.681**	.083
Emotional well-being	-.192	-.106	.462	.214	**.656**	.089
Coping with daily problems	-.216	-.064	.407	.211	**.687**	.066
Overall my physical well-being is:	-.139	-.030	.035	.137	.093	**.835**
Overall my mental/emotional state is:	-.158	-.053	.073	.065	.069	**.866**
Overall my ability to handle stress is:	-.163	-.019	.146	.051	.102	**.850**
Overall my enjoyment of life is:	-.170	-.024	.094	.049	.135	**.897**
Overall my quality of life is:	-.171	-.014	.069	.034	.148	**.899**

Note: Loading coefficients highlighted in **bold** apply to the clusters of items that discriminated between the six dimensions, i.e., 1 = Overall Quality of Life; 2 = Life Enjoyment; 3 = Mental/Emotional State; 4 = Physical State; 5 = Stress Evaluation, and 6 = Overall Impressions

Table 4.8

Reliability Analysis for the Six Dimensions of the Quality of Life Questionnaire

Dimension	Variable	Number of Items	Cronbach's alpha
1	Overall Quality of Life	14	.963
2	Life Enjoyment	11	.944
3	Mental/Emotional State	10	.919
4	Physical State	10	.835
5	Stress Evaluation	10	.885
6	Overall Impressions	5	.941

Descriptive Statistics for Six Dimensions of Quality of Life

Table 4.9 presents the descriptive statistics to show how the six dimensions of QoL (i.e., Overall Quality of Life; Life Enjoyment; Mental/Emotional State; Physical State; Stress Evaluation; and Overall Impressions) changed over time for $N = 101$ participants who received MAT during the course of this study. The statistics include the mean (*M*) and standard deviation (*SD*) for each of the repeated measures collected in 2013, 2015, 2016, and 2017, as well as the overall change scores (i.e., the last measures collected in 2017 minus the first measures collected at admission in 2013).

Table 4.9

Descriptive Statistics for the Six Dimensions of Quality of Life Between 2013 and 2017

Dimension		2013	2015	2016	2017	Overall Change Score
Overall Quality of Life	*M*	4.77	4.64	4.70	4.67	-0.10
(Scored from 1 to 7)	*SD*	1.20	1.39	1.25	1.38	1.51
Life Enjoyment	*M*	3.02	3.05	2.89	2.90	-0.13
(Scored from 1 to 5)	*SD*	0.93	0.93	0.87	0.98	1.21
Mental/Emotional State	*M*	2.05	2.10	2.13	1.98	-0.06
(Scored from 1 to 5)	*SD*	0.80	0.79	0.86	0.80	0.94
Physical State	*M*	2.16	2.17	2.13	2.00	-0.16
(Scored from 1 to 5)	*SD*	0.65	0.69	0.58	0.59	0.66
Stress Evaluation	*M*	2.04	2.06	2.11	1.92	-0.12
(Scored from 1 to 5)	*SD*	0.77	0.79	0.73	0.75	0.91
Overall Impressions	*M*	1.35	1.33	1.33	1.27	-0.07
(Scored from 1 to 3)	*SD*	0.53	0.48	0.45	0.43	0.64

Overall Quality of Life was highest in 2013 and lowest in 2015 with an overall negative change score implying a reduction in feelings associated with quality of life. Life Enjoyment was highest in 2015 and lowest in 2016 with an overall negative change score implying a reduction in the level of experience of enjoyment. Mental/Emotional State was highest in 2016 and lowest in 2017 with an overall negative change score implying a reduction in the frequency of emotional distress. Physical State was highest in 2015 and lowest in 2017 with an overall negative change score implying a reduction in the frequency of physical distress. Stress Evaluation was highest in 2016 and lowest in 2017 with an overall negative change score implying a reduction in the level of psychological stress between 2013 and 2017. Overall Impressions was highest in 2013 and lowest in 2017 with an overall negative change score implying that the current Overall Quality of Life associated with physical well-being, mental/emotional state, ability to handle stress, and enjoyment was better compared to when the patients first entered treatment. The standard deviations were consistently high, constituting over 25% of the mean scores for Overall Quality of Life and Physical State, over 30% of the mean scores for Life Enjoyment, and over 35% of the mean scores for Mental/Emotional State, Stress Evaluation, and Overall Impressions.

Long-Term Changes in Quality of Life Over Time (2013 to 2017)

This section presents the statistical evidence to address RQ1: To what extent did the six dimensions of the patients' QoL (i.e., Overall QoL, Physical State; Mental/ Emotional State; Stress Evaluation; Life Enjoyment; and Overall Impressions) measured with the Health, Wellness, and Quality of Life Questionnaire, change over time while they were receiving MAT? Using the full set of response data collected in 2013, 2015, 2016, and 2017, Table 4.10 presents the results of correlation analysis (Pearson's *r* coefficients) to determine the extent to which the overall change scores for the six dimensions of QoL reported in Table 4.9 were correlated with

the time the patients were in treatment (months). The results indicated that the overall change scores were weakly correlated (Pearson's r (95) = .112 to .283) with the time in treatment, including four statistically significant correlation coefficients ($p < .05$). These correlations implied that time in treatment was a factor that was associated with the magnitudes of the overall change scores between 2013 and 2017. Consequently, time in treatment had to be controlled (i.e., this source of variance had to be excluded).

Table 4.10

Correlations Between Overall Change Scores for Six Dimensions of Quality of Life and Time in Treatment

Change Score	Number of months in treatment
Overall QoL	-.297*
Life Enjoyment	-.283*
Mental/Emotional State	.144
Physical State	.242*
Stress Evaluation	.212*
Overall Impressions	.112

Note: * Significant ($\alpha = .05$)

Repeated measures Analysis of Covariance (ANCOVA) was conducted using the four repeated measures collected using the Health, Wellness, and Quality of Life Questionnaire in 2013, 2015, 2016, and 2017 as the dependent variable. Time in treatment (months) was the covariate. Time in treatment was controlled by holding it statistically constant (M = 74.78 months). Sphericity was consistently indicated by $p > .05$ for Mauchly's W statistics. The results of ANCOVA assuming sphericity are presented in Table 4.10. The F statistics, p-values, and effect sizes (η^2) are reported for the within-subject effects (i.e. across the four repeated measures, as well as the interaction between the four repeated measures and time in treatment). The interpretation of the effect size (η^2) was based on Ferguson's (2009) review of the effect size criteria for clinicians and researchers in psychology. The recommended cut-offs for squared

association indices are as follows: .04 = minimum effect size representing a practically or clinically significant effect; .25 = moderate effect size; and .64 = strong effect size.

Table 4.11

ANCOVA for Within-Subject Effects on Changes in Six Dimensions of Quality of Life Over Time

Within-Subject Effect	*F* *(3, 279)*	*p*	η^2
Overall Quality of Life	2.55	.056	.03
Interaction with Time in Treatment	3.57	.015*	.04
Life Enjoyment	1.31	.271	.01
Interaction with Time in Treatment	2.48	.064	.03
Mental/Emotional State	0.88	.451	.01
Interaction with Time in Treatment	0.98	.404	.01
Physical State	2.82	.040*	.03
Interaction with Time in Treatment	2.38	.073	.03
Stress Evaluation	1.67	.173	.02
Interaction with Time in Treatment	1.56	.200	.02
Overall Impressions	0.96	.414	.01
Interaction with Time in Treatment	0.66	.575	.01

Note: Time in treatment was held constant (74.78 months). * Significant (α = .05).

Only two statistically significant ($p < .05$) within-subject effects were found. The interaction between Overall Quality of Life and Time in Treatment was significant (F (3, 279) = 3.57, p = .015). Applying Ferguson's (2009) criteria the effect size ($\eta^2 = .04$) indicated a minimum level of practical or clinical significance. Although Physical State changed significantly over time (F (3, 279) = 2.82, p = .040), the effect size ($\eta^2 = .03$) reflected less than the minimum level of practical or clinical significance. When the Bonferroni correction was

applied (using $\alpha = .05/6 = .008$ instead of $\alpha = .05$), then no statistically significant results were obtained; however, the use of the Bonferroni correction has been highly criticized in the literature. Some statisticians have suggested that the use of the Bonferroni correction should be discontinued because it reduces statistical power, and lowers the α level too much, resulting in erroneous statistical inferences (Frane, 2015; Geldman, Hill, & Yajima, 2013; Nakagawa, 2004; O'Keefe, 2003; Perneger, 1998).

Effects of Psychosocial Stressors

This section presents the statistical evidence to address RQ2: To what extent were the changes in the patients' QoL over time measured with the Health, Wellness, and Quality of Life Questionnaire while they were receiving MAT associated with the patients' (a) mental health characteristics (i.e., anxiety and depression); (b) physical health characteristics (i.e., high blood pressure; diabetes; COPD/emphysema; and hepatitis C; (c) domestic/family violence and child abuse; (d) severity of substance use at admission; (e) current substance use; and (d) current withdrawal symptoms. To address this question, repeated measures ANCOVA was conducted using the psychosocial stressors reported in Tables 4.2, 4.3, 4.4, 4.5 and 4.6 as the between-subject effects and time in treatment as the covariate. All the between-subject effects that were not statistically significant ($p < .05$) were excluded, as they only represented noise (i.e., unexplained sources of variance) that confounded the results. The ANCOVA statistics are presented in Table 4.12.

Anxiety had a significant effect on Overall Quality of Life (F (1, 91) = 12.91, p = .001). However, when applying Fergusons' (2009) criteria, the effect size ($\eta^2 = .12$) was less than moderate (< .25). Alcohol use also had a significant effect on Overall Quality of Life (F (1, 91) = 4.29, p = .041) with a very small effect size ($\eta^2 = .05$). Non-prescribed opioid use also had a

significant effect on Life Enjoyment (F (1, 92) = 4.99, p = .028) with a very small effect size (η^2 = .05). Anxiety had a significant effect on Mental/Emotional State (F (1, 92) = 10.87, p = .001) with a less than moderate effect size (η^2 = .11). Substance use in the participant's childhood home also had significant effect on Mental/Emotional State (F (1, 92) = 5.990, p = .016) with a (F (1, 92) = 10.87, p = .001) with a less than moderate effect size (η2 = .06). Non-prescribed opioid use had a significant effect on Physical State (F (1, 91) = 14.03, p < .001) with a less than moderate effect size (η^2 = .13). Being physically abused as an adult also had a significant effect on Physical State (F (1, 91) = 5.88, p = .017) with a very small effect size (η^2 = .06). Anxiety had a significant effect on Stress Evaluation (F (1, 92) = 15.27, p < .001) with a less than moderate effect size (η^2 = .14). The small to less than moderate effect sizes indicated limited practical or clinical significance. None of the psychosocial stressors were found to have a significant effect on Overall Impressions. When the Bonferroni correction was applied (using α = .05/5 = .01 instead of α = .05), only four statistically significant results were found with respect to the effects of Anxiety on Overall Quality of Life, Mental/Emotional State, and Stress Evaluation, as well as the effect of non-prescribed opioid use on Physical State.

Table 4.12

ANCOVA for Between-Subject Effects on Changes in Six Dimensions of Quality of Life Over Time

Dimension	Between-Subject Effect	*df1*	*df2*	*F*	*p*	η^2
Overall Quality of Life	Anxiety	1	91	12.91	.001*	.12
	Alcohol use	1	91	4.29	.041*	.05
Life Enjoyment	Non-prescribed opioid use	1	92	4.99	.028*	.05
Mental/Emotional State	Anxiety	1	92	10.87	.001*	.11
	Substance use in childhood home	1	92	5.99	.016*	.06

Physical State	Non-prescribed opioid use	1	91	14.03	<.001*	.13
	Physically abused as adult	1	91	5.88	.017*	.06
Stress Evaluation	Anxiety	1	92	15.27	<.001*	.14

Note: * Significant ($\alpha = .05$)

Table 4.13 presents the statistics to describe the sources of the differences reported in Table 4.12. The Overall Quality of Life of participants who did not suffer from anxiety was better ($M = 4.77$) than those who did not ($M = 4.20$). The Overall Quality of Life of participants who did not use alcohol was better ($M = 4.76$) than those who did not ($M = 4.20$). The Life Enjoyment of participants who did not use non-prescribed opioids was better ($M = 3.00$) than those who did not ($M = 2.47$). The Mental/Emotional State of participants who did not suffer from anxiety was worse ($M = 1.91$) than those who did not ($M = 2.24$). Participants who were exposed to substance use in their childhood home had more mental/emotional distress ($M = 2.27$) than those who did not ($M = 1.99$). The Physical State of participants who did not use non-prescribed opioids ($M = 2.19$) was better than those who did not ($M = 1.47$). The Stress Evaluation of participants who suffered from anxiety was worse ($M = 2.22$) than those who did not ($M = 1.85$).

Table 4.13

Descriptive Statistics for Between Subject Effects

Dimension	Between-Subject Effect	*No*		*Yes*	
		M	*SD*	*M*	*SD*
Overall Quality of Life	Anxiety	4.77	0.17	4.20	0.15
	Alcohol use	4.76	0.08	4.20	0.26
Life Enjoyment	Non-prescribed opioid use	3.00	0.06	2.47	0.24
Mental/Emotional State	Anxiety	1.91	0.07	2.24	0.07

	Substance use in childhood home	1.99	0.06	2.27	0.09
Physical State	Non-prescribed opioid use	2.19	0.05	1.47	0.19
	Physically abused as adult	1.72	0.11	1.98	0.10
Stress Evaluation	Anxiety	1.85	0.07	2.22	0.07

Short-Term Changes in Quality of Life over Time (2013 to 2015)

This section presents further statistical evidence to address RQ1: To what extent did the six dimensions of the patients' QoL (i.e., Overall QoL, Physical State; Mental/ Emotional State; Stress Evaluation; Life Enjoyment; and Overall Impressions) measured with the Health, Wellness, and Quality of Life Questionnaire, change over time while they were receiving MAT? Using the short-term change scores between the baseline and the first assessment, a positive change score represented an increase over time; a negative score represented a decrease over time; and a change score of zero represented no change over time. Table 4.14 presents the results of paired *t*-tests to determine if the change scores were significantly different from zero.

Table 4.14

Analysis of Short-Term Changes in Quality of Life Between 2013 and 2015

Dimension		2013	2015	Change Score	*t* (100)	*p*
Overall Quality of Life	*M*	4.77	4.64	-0.13	-0.82	.417
(Scored from 1 to 7)	*SD*	1.20	1.39	1.60		
Life Enjoyment	*M*	3.02	3.05	0.02	0.18	.854
(Scored from 1 to 5)	*SD*	0.93	0.93	1.27		
Mental/Emotional State	*M*	2.05	2.10	0.05	0.47	.639
(Scored from 1 to 5)	*SD*	0.80	0.79	1.04		
Physical State	*M*	2.16	2.17	0.01	0.13	.901

(Scored from 1 to 5)	*SD*	0.65	0.69	0.79		
Stress Evaluation	*M*	2.04	2.06	0.03	0.24	.808
(Scored from 1 to 5)	*SD*	0.77	0.79	0.94		
Overall Impressions	*M*	1.35	1.33	-0.02	-0.25	.800
(Scored from 1 to 3)	*SD*	0.53	0.48	0.71		

All of the changed scores between the baseline and the first assessment were close to zero (-0.13 to 0.05) and the *t*-test statistics (t (100) = -0.82, p = .417 to *t* (100) = 0.13, *p* = .901) indicated that the changed scores were not significantly different from zero (p > .05). None of the six QoL dimensions were found to significantly increase or decrease in the short term between 2013 and 2015.

Summary

The analysis was based on 102 patients who had provided four complete sets of response data for the Health, Wellness, and Quality of Life Questionnaire with no missing values in 2013, 2015, 2016, and 2017 respectively and patients who had provided demographic and psychosocial data on admission. The statistical evidence was based on principal components factor analysis, and reliability analysis with Cronbach's alpha indicated that the six dimensions extracted from the 60 items in the Health, Wellness, and Quality of Life Questionnaire were reliably measured.

The answer to the first research question is that, although there were some small long-term changes in the six dimensions of the patients' QoL measured with the Health, Wellness, and Quality of Life Questionnaire between 2013 and 2017 and while they were receiving MAT, these changes appeared to have limited practical or clinical significance, based on the effect size criteria defined by Ferguson (2009). Furthermore, there were no statistically significant short-term changes in the six dimensions of the patients' QoL between 2013 and 2015.

The answer to the second research question is that several psychosocial stressors, including anxiety, alcohol use, non-prescribed opioid use, being physically abused as a child, and childhood exposure to substance use, had statistically significant effects on the dimensions of the Health, Wellness, and Quality of Life Questionnaire; however, based on the criteria defined by Ferguson (2009), these effects may have limited practical or clinical significance. Ferguson points out, however, that for effects with highly valid and reliable outcomes (e.g., death) and when analyzing the results of rigorous randomized controlled trials, small effect sizes close to .04 might have some practical or clinical significance.

Discussion

This discussion is presented in six sections. First, a brief summary of the findings of this study is stated. Second, findings related to the quality of life of the participants are discussed, along with the psychosocial factors that may have had an influence on the quality of life outcomes for participants. Third, the results and methods of the current study are compared to those of published research. Fourth, the limitations of the study are explained. Fifth, the implications for social work practice are explored. Finally, some future directions for research are recommended.

Summary

Limited research has been conducted to evaluate the long-term sustainability of the quality of life (QoL) among patients with severe opioid use receiving medication-assisted treatment (MAT). The aim of the current research was to improve understanding of the QoL and psychosocial functioning of persons enrolled in an Opioid Treatment Program (OTP) and receiving MAT over a four-year period. Furthermore, the potential independent predictors of improved QoL were examined, including demographic, psychosocial, and drug and health-related variables.

The participants of this study showed both short-term and long-term improvement in the six dimensions of the patients' QoL (i.e., Overall QoL, Physical State, Mental/Emotional State, Stress Evaluation, Life Enjoyment, and Overall Impressions) while receiving medication-assisted treatment during the study period. Several psychosocial stressors, including anxiety, alcohol use, non-prescribed opioid use, being physically abused as a child, and childhood exposure to substance use had statistically significant effects on the dimensions of QoL; however, the small effect sizes indicated that the clinical significance of these results was limited.

Evaluation of Changes in Quality of Life Over Time

QoL has been acknowledged as an important outcome measure and a useful assessment tool to evaluate the quality of healthcare for individuals suffering from chronic illnesses, including substance use disorders (Higginson & Carr, 2001; Katschnig, 2006; van den Bos & Triemstra, 1999). This study revealed improved QoL of the participants over the five-year study period. The QoL of individuals receiving medication-assisted treatment for opioid use disorder improved over the study period, with participants experiencing a reduction in psychological, physical, and emotional distress. However, these results are tempered with respondents also reporting decreases in life enjoyment and feeling relative to the QoL experience. The dissonance between the respondents reporting overall improvement in QoL, but not the benefits of having an improved QoL (i.e., life enjoyment) is consistent with other QoL studies that explore the relationship between objective and subjective QoL (Lehman, 1996).

There is consistent agreement among QoL researchers that the subjective appraisal of life often bears little or no relation to objective life circumstances (Barry & Crosby, 1996). An individual may evaluate the same objective event with contrasting perceptions depending on his/her perspective at the time of interview (Skantze, Wanke, & Bless, 1994). Objective improvements in life circumstances may produce negative subjective responses (Lehman, 1996) while objective declines in circumstances may produce more positive subjective responses than would be expected (Atkinson, Zibin, & Chuang, 1997; Katschnig & Angermeyer, 1997).

QoL judgments represent unique self-reflections of personal perspectives and experiences (Bonomi et al., 2000; Cummins, 2005; Haslauer, Delmell, Keul, Blaschkyt, & Prinz, 2015; Ryan & Deci, 2001). How individuals judge their QoL does not always equate to what their objective situation may suggest (Albrecht & Devlieger, 1999; Fellinghauer et al., 2012). The respondents

in this study are reporting what Albrecht & Devlieger (1999) termed a "disability paradox." Their individual judgments about life enjoyment, contentment with life, and life being what they expected are independent of the fact that they are not experiencing psychological, emotional, and physical distress typically associated with ceasing use of opioids (Cummins, 2005). This is a common occurrence in QoL research, where the study questionnaire includes both objective and subjective constructs (Roe, 2005). Subjective QoL ratings are especially vulnerable to the respondent's current affective state, and more so when mood states are particularly labile, for example, in those with psychosis, depression, and manic euphoria (Brissos, Vieira-Dias, Kapezinski, 2008).

Most researchers agree that QoL is a multidimensional construct (Bowling, 2005; Cummins, 2005; Schalock, 2005). It seems to involve a complex interaction of individual (age, sex, socio-economic status, and employment), social (children, relationships, and activities), health, and spiritual domains. Arguably then the QoL experienced by individuals receiving MAT is likely to represent more than the effects or consequences of frequency and/or quantity of the treatment alone (Tiffany et al., 2012). QoL assessments also tend to be dynamic. That is, they might change over time and in response to different life events. Importantly, across the life course, individuals tend to alter their expectations of what constitutes QoL (Diener & Suh, 1997; Schalock, 2005). For example, subjective well-being appears to take on a 'u' shape across the life course (Blanchflower & Oswald, 2008). These changes in QoL seem to occur because the value individuals place upon what is important to them changes with time (Haslauer et al., 2015) and context (Diener & Suh, 1997). These adjustments seem likely to be influenced by a combination of circumstances, coping methods, and expectations (Bonomi et al., 2000; Brissos,

Vieira-Dias, Kapezinski, 2008). The participants in this study are most likely experiencing this life course shift.

This distinction between objective and subjective responses and outcomes is an important point to belabor as it gives the reader a lens by which to understand the clinical significance of these findings. Although in this study the size effect of improved QoL is small, this does not necessarily mean that the clinical significance is equally small. If we simply look at what motivates individuals to seek MAT—the desire to feel better, have less distress, cease their substance use, or gain order out of chaos (White, 1998)—then the reductions in distress and the perception that their life is better since starting treatment is clinically significant for both the patient and the clinician. Likewise, the poor subjective rating is also clinically significant, as it tells the clinician that this patient is not getting the emotional benefit they expected from distress reductions and abstinence, which is a significant risk factor for dropping out of treatment (Hser, Saxon, Huang, Hasson, Thomas, Hillhouse, Ling, 2014; Connery-Smith, 2015).

Stantze et al., (1994) point out that subjective assessments and evaluations of change are a function of the cognitive processes employed at the time of judgment. Whether we infer that something has changed and whether the change was for the better or the worse depends on the mental representations formed and the inference rules applied. Hence, subjective reports of change provide an inadequate substitute for objective assessments of change in longitudinal studies. Moreover, subjective social indicators, such as reports of life satisfaction, are not a direct reflection of any stable inner state of the respondent, in contrast to what the pioneers of the social indicator movement had hoped for (Campbell, 1981). Rather, these reports reflect judgmental processes that are, to a large degree, shaped by the research instrument and are influenced by question context, question framing, mood at the time of judgment, and other fortuitous variables.

As such, the lack of improvement in the subjective QoL measure, life enjoyment, and feeling relative to the QoL experience are most likely influenced by factors other than their participation in the MAT program. The most likely contributing factor is that the patients did not fulfill their initial high expectations of treatment and this might have an adverse impact on the patients' subsequent perceptions about the emotional benefits of having an improved QoL (Fei et al., 2016; Habrat et al., 2002).

How patients evaluate their subjective QoL may also change over time. Personal standards may vary when appraising the same questionnaire item on different days. For example, patients who are not prepared for the possibility of precipitated withdrawal are more likely to be distressed and confused by its onset, with potential negative consequences (e.g., treatment drop-out, abuse of other medications). Therefore, reported changes in QoL over time need not necessarily derive from actual changes in health or symptoms (Muldoon et al., 1998). It becomes vitally important to evaluate the clinical significance of the change in subjective and objective QoL independently of one another.

It is difficult to directly compare the current research findings with other results in the literature because previous research has not used the same instruments to measure QoL. Previous research was conducted over shorter periods, with most data analyses relying on t-tests for evaluating change. The current study was the first to conduct evaluation of QoL after a year of treatment using multivariate analysis. Previous studies only considered short-term changes, mainly in health-related QoL. Villeneuve et al. (2006) concluded that, within six months after the start of MAT, significant improvements occurred in six domains of the Short Form Health Survey (SF-36) and the mental component summary score. Several studies using the WHO QoL-Bref, provided similar findings indicating significant improvements in QoL during the early

stages of MAT (Baharom et al., 2012; Fei et al., 2016; Kobra et al., 2012; Mitchell et al., 2015). QoL improvements after six to about twelve months MAT have also been reported (Baharom et al., 2012; Karow et al., 2011; Padaiga et al., 2007). While nearly all the studies discussed in Chapter 2 reported improved QoL ratings for respondents, the researcher's use of a t-test does not provide a robust examination of these QoL improvements. The t-test is not only one of the simplest, but also one of the most misused and misinterpreted methods of statistical analysis. In a review of statistical errors in medical research, Young (2007), stated that t-tests "are to statistics what cupping, bloodletting and leaches are to medicine: of historical interest, on rare occasions still useful, but largely superseded by superior methods" (p. 42). It is important to note that the results of a t-test do not take into account the infinite number of independent variables that could possibly explain the variance in the dependent variable (e.g., QoL). Time is only one independent variable among a multitude of other variables that could be responsible for changes in QoL. In previous studies, the results of t-tests only showed if time was associated with changes in QoL, but there are many other factors other than time that could be responsible for changes in QoL. P-values, especially those obtained using t-tests, are unreliable measures of statistical evidence because they are a function of the sample size, and they do not provide any information about the effect size or the strength of the relationships between two or more variables (Hubbard & Lindsay, 2008; Kuhberger et al., 2015; Nuzzo, 2014). According to Vacha-Haase (2014) "Statistical significance should not be considered as one of life's guarantees. Effect sizes are needed" (p. 219). The issue with prior research being based on the p-values of t-tests (and not the effect sizes) explains why the findings related to short-term improvements in QoL are not discussed as a main finding of this study.

Evaluation of Changes in Quality of Life Over Time and Psychosocial Stressors

One of the aims of MAT is pro-health changes that include not only an improvement in the somatic state of health but also psychological and social functioning (Roe, 2005). Previous research on QoL indicates that psychosocial factors can influence QoL measures, especially psychiatric and medical comorbidity (De Maeyer et al., 2010). The participants in this study, experienced a variety of psychosocial stressors including depression, anxiety, chronic illness, continued substance use, childhood trauma, intimate partner violence, and exposure to parent substance use in formative years. However, only psychiatric comorbidity and continued substance use, specifically anxiety and use of alcohol, were significantly related to a reduction in the overall QoL. Anxiety also significantly increased an individual's mental/emotional state and stress evaluation, and patients who reported experiencing anxiety reported having more incidents of mental/emotional distress. Non-prescribed opioid use had a significant effect on life enjoyment and physical health. A history of intimate partner battering also had a detrimental effect on physical health. Ultimately, several psychosocial stressors had statistically significant effects on the dimensions of Health, Wellness, and Quality of Life, but the effect sizes were consistently small.

Despite the small effect sizes of psychiatric comorbidity and substance use on the subjective measures of QoL, these influencers are still clinically important. The psychosocial variables evaluated in this study are much easier measures of objective QoL subscale and in the literature are typically associated with a change in objective circumstances rather than subjective QoL. Objective measures prove to be more suitable in detecting the effects of treatment interventions because the goal of MAT is not about improving the subjective QoL of patients, but rather reducing harms associated with opioid use disorder (Järvinen, 2008). Although the

reduction in opioid use remains the principal target of MAT (rather than the patient's subjective QoL), objective information might be more suitable for building predictive models and in the longitudinal assessment of substance use disorder.

The findings of the current research were consistent with previous studies demonstrating that emotional problems, such as anxiety, have a detrimental impact on the QoL of opioid users (Carpentier et al., 2009; Batki et al., 2009; Millson et al., 2006). Previous research indicates that conflicts with family and partners have been previously shown to be associated with lower QoL scores (Karow et al., 2008). Finally, Millson et al. (2006) conducted one of the most comprehensive evaluations of health and mental health on QoL, identifying multiple mental and physical determinants of the health-related QoL of opioid-dependent individuals. Millson concluded that poor health related QoL scores were attributed to health and psychological distress rather than to the individual’s opioid use disorder.

This study differs from the findings of Deering et al. (2004) and Bizarri (2005), who found no association between drug related variables and the QoL of opioid injecting drug users. Alcohol use had a significant effect on Overall QoL ratings, which is consistent with alcohol related QoL studies (Foster et al., 1999). Non-prescribed opioid use also had a significant effect on Life Enjoyment, and both had relatively small size effect, indicating that the clinical significance of these outcomes is limited. These findings illustrate the limited influence of substance use on current QoL and highlight the need for treatment goals other than stopping or reducing drug and alcohol use. Being abstinent from drugs or reducing drug use is not necessarily accompanied by improvements in QoL, since giving up the patient perceptive benefit of substance use, especially coping with various stressors (e.g. loneliness, boredom,

discrimination, and depression) might have a negative impact of the individual's QoL (De Maeyer et al., 2009).

Limitations

There are several limitations to this study. A major limitation of the analysis of all secondary data is that the researchers who are analyzing the data are not the same individuals as those involved in the data collection process. In this study, the researcher did not have access to the original QoL questionnaires that were collected to verify the accuracy of the information received. There is limited information regarding the data collection process. The researcher is most likely unaware of study-specific nuances or problems that may have occurred in the data collection process that might be important to the interpretation of specific variables in the dataset. The relatively small sample size of participants (N = 102) may also be a limitation, because the results that were not statistically significant may have been caused by Type II errors, associated with limited statistical power (Zodpey, 2004). Study findings were derived from a convenience sample of patients and not from a representative sample drawn randomly from the population (Creswell, 2014). As such, the sample may not be representative of all patients receiving MAT for opioid use disorders. Consequently, the findings of this research should be interpreted cautiously as they may not generalize to all patients in MAT. Response bias is also an issue in this study as measures of QoL were derived from self-report questionnaires. Choi & Pak (2005) reported 48 sources of bias in self-report questionnaires, some of which are associated with subjective rather than objective responding. Additionally, although the sample size was sufficient based on the priori power analysis conducted, it is relatively small given the number of persons and the diversity of persons who currently participate in MAT program across the United States. As such, the results of this study should be temper with this fact.

A shortcoming of longitudinal research designs in medical science is the regression toward the mean (Bland & Alton, 1994; Morton & Torgerson, 2003; Linden, 2013; Weeks, 2007). Due to the effects of random variation, extreme test scores that are underestimated or overestimated at the beginning of a longitudinal study automatically become more correctly estimated and tend to move toward the mean value, before the end of the study. Therefore, the changes in the test scores before and after a prescribed clinical intervention might only be due to the statistical effects of the regression toward the mean and may have little or nothing to do with the effects of an intervention.

A further limitation of the research design was the lack of a control group of patients not receiving MAT to compare with the treatment group. Because there was no control group, the conclusions of this research were based on the assumption that the variability in the psychological functioning and QoL of the patients over time was influenced only by the MAT. In reality, there might be an infinite number of variables that were not observed or analyzed in this study that could potentially be associated with the variability in the psychological functioning and QoL of the patients.

As the conclusions were based on the analysis of mean scores, derived from only one group of participants who received MAT, it was not possible to determine the extent to which the conclusions could be generalized to every individual with that group. The changes in the psychological functioning and QoL of each individual patient were not necessarily exactly the same as the mean changed among all of the patients. To assume that each individual in a defined group behaves in exactly the same way as the whole group is an ecological fallacy. This assumption is a very common error in medical, psychological, and educational research, where

participants are often classified into groups (Diez-Roux, 1998; Idrovo, 2011; May, Boe, & Boruch, 2003).

Lastly, there were no baseline scores by which to evaluate longitudinal change. Because the clinic began collecting data in 2013, many of the participants had been in treatment for a significant period of time. Given that there was no baseline measure of QoL at admission, it is difficult to evaluate the significance of any change that did or did not occur over the study period.

In order to provide a more detailed explanation of why medication-assisted treatment appeared only to slightly improve the QoL of the patients as a whole, more research is required as outlined in the next section.

Implications for Practice

The findings of the current research contributed to knowledge and understanding of evidence-based practice regarding the effectiveness of MAT for the long-term treatment of patients with opioid use disorders. In addition to medication-assisted treatment being the most effective form of substance use treatment for reducing and eliminating illicit opioid use (Mattick, Kimber, Breen, & Davoli, 2014; Mattick et al., 2009), the findings of this study revealed that over time the objective QoL of persons being treated for severe opioid use disorder is sustained if not minimally improved. Although the treatment of opioid use disorder with methadone and buprenorphine appears to reduce physical, psychological, and emotional distress, this treatment appeared to have a limited long-term impact on the patients' subjective QoL. Psychosocial stressors such as anxiety, depression, and physical health characteristics that are not addressed by medication alone did, however, have certain significant effects on the patient's QoL.

The practical implications are that a better understanding of the determinants of low levels of QoL, such as anxiety and physical abuse, may potentially inform treatment service providers about factors that need to be addressed in treatment and may improve their patients' subjective QoL (Carr et al., 2001). Furthermore, there are implications for practice because patients participating in a MAT program might require long-term psychosocial treatment in addition to medication in order to experience the subjective benefit of an improved QoL. Several previous trials reviewed by McHugh, Hearon, and Otto (2010) have concluded that psychosocial treatment, especially cognitive behavioral therapy (CBT), either as a monotherapy or as part of a combination treatment strategy, has beneficial psychological outcomes for patients with substance use disorders. Pan, Jiang, Du, Chen, Li et al. (2015) working in China conducted a randomized controlled trial in which the stress levels of a control group, exposed only to methadone maintenance treatment (MMT), were compared with an experimental group, exposed to weekly CBT as well as MMT using repeated measures ANOVA. After 12 and 26 weeks of treatment, the total scores for the Perceived Stress Scale were significantly lower in the experimental group than in the control group.

Given the distinct nature of subjective QoL and its lack of association with standard addiction treatment predictors and outcomes, what is to be its role in outcome assessment? Some QoL researchers consider the individual's perception of his/her circumstances to be the central component of QoL (Cummins, 2005). Their approach has the merit of empowering clients and giving them a central role in the development of treatment services. Others, frustrated by the lack of correspondence between subjective and objective information, would abandon subjective evaluation (Atkinson et al., 1997). Warner (1999) has addressed this issue using an analogy with an equivalent area in anthropology using the issue of "emics" and "etics," which deals with

similar complexities of informants' perceptions of reality *versus* the views of outside observers. He argues that subjective and objective appraisals are different kinds of data and that both have a role in QoL assessment.

The subjective dimension is essential in painting a complete picture of the person's life, in explaining patterns of behavior and in providing the subject's interpretation of the personal impact of objective circumstances. It is clear that various factors make it difficult to build predictive models around subjective outcomes: the tendency towards psychological adaptation or 'response shift' that can occur over time in the subjective appraisal of a person's current state and the multifactorial determinants of subjective outcomes and the diverse reaction of different individuals to the same circumstances. Quality of life refers to complex aspects of life that cannot be expressed by using only quantifiable indicators; it describes an ultimately subjective evaluation of life in general.

The findings of the current research have theoretical as well as practical implications. The theoretical framework that underpinned this study proposed that individuals with opioid use disorders experience psychosocial stressors that are associated with the costs of their substance use disorder. When individuals engage in a MAT program, their physical withdrawal is arrested, the psychosocial stressors improve, and they begin to experience improvements in how they experience stress, physical health, and emotional wellbeing. The improvements in these QoL domains result in the impression that the patient QoL has generally improved since admission. The findings of the current research contributed to theory by providing limited evidence to support this proposition.

Recommendations for Future Research

The chronic and relapsing conditions common in opioid use disorder indicates that a long-term treatment approach is necessary (Van den Brink & Haasen, 2006; Volkow et al., 2014) and, therefore, understanding the long-term changes in QoL are important for both patients and clinicians. To improve internal and external validity, it will be necessary to conduct further quantitative studies, using larger sample sizes with greater statistical power and with controlled patient characteristics. A pre-test/post-test control group research design is recommended (Bonate, 2000; Dimitrov & Rumrill, 2003), and collecting a baseline measure at admission is imperative. In using this type of research design, the multiple dimensions of both objective and subjective QoL of the patients are compared before, during, and after treatment between a randomly selected control group (not exposed to MAT) and a randomly selected treatment group (exposed to MAT). A pre-test/post-test control group design suffers from several threats to internal validity, including regression toward the mean (Marsden & Torgerson, 2012). This could, however, be controlled using appropriate methods of statistical analysis (Barnett, Van der Pols, & Dobson, 2004).

Further quantitative research can only evaluate the extent to which groups of patients who are exposed to MAT may achieve better mean levels of QoL compared to patients who are not so exposed. The researcher suggests that more qualitative research needs to be conducted to explore the QoL of individual patients rather than groups of patients. Qualitative research is essential to explore the lived experiences of each individual patient as well as the individual healthcare providers who treat each patient (Rahman & Majumber, 2013). For example, face-to-face interviews with patients and healthcare providers may help to provide more insight and help to address more complex research questions beginning with “Why,” such as “Why do certain

individual patients exposed to the MAT achieve better QoL outcomes than others?" Case studies using face-to-face interviews might help to identify the individual needs of patients and healthcare providers at different treatment centers rather than the overall needs of all patients and all healthcare providers at all treatment centers. By interviewing the patients and healthcare providers personally, rather than remotely analyzing a set of quantitative response data, the researcher would be able to develop a rapport with the participants, clarify questions, and prompt detailed answers based the experiences, beliefs, attitudes, and perceptions related to subjective QoL (Denzin & Lincoln, 2008; Merriam, 2014).

The current research was also somewhat limited because it was not underpinned by a strong healthcare theory. Qualitative research to explain why some patients exposed to the MAT achieve better QoL outcomes than others could be bolstered by a core healthcare theory, such as the COM-B model. This model characterizes interventions that aim to result in behavior change interventions in healthcare settings (Michie, Van Stralen, & West, 2011). The COM-B model, which is based on qualitative research, posits that an interaction between three components—capability, opportunity and motivation (COM)—is the main reason healthcare providers and patients ultimately come to achieve a specific desirable behavior (B). The COM-B model, otherwise known as the behavior change wheel, recognizes that human behavior is part of an interacting system, and that clinical or psychological interventions need to change one or more of these components in such a way as to reorganize the system into a new configuration. For the purpose of the recommended research, the specific desirable behavior is an improvement in the psychological functioning and QoL of the patients enrolled in opioid treatment programs. Capability includes the patients' and healthcare providers' capacity to engage in desirable thought processes and physical processes that will improve the psychological functioning and

QoL of the patients. Opportunity includes physical factors that include interactions with healthcare providers that prompt patients to achieve the desirable behavior. Motivation includes cognitive processes that invigorate and direct patients' or healthcare providers to achieve the desirable behavior. The COM-B model could potentially be applied in future qualitative research to explain why certain individual patients receiving MAT achieve better QoL outcomes than other patients based on the interactions between the patients' and healthcare providers' capabilities, opportunities, and motivations.

Conclusion

Ultimately, this study has revealed that individuals receiving MAT for opioid use disorder need psychosocial supports throughout the entirety of their treatment, regardless of the length of the episode. A satisfactory QoL is mediated by psychological well-being. Consequently, a more holistic approach to MAT is recommended, which goes beyond pharmaceutical maintenance and medical care to include special attention for psychological complaints and trauma. The findings of this study provided evidence to support the continued development of opioid treatment programs in order to achieve the healthcare providers' ultimate goals of improving the long-term psychological functioning and QoL of patients with serious opioid use disorders. Healthcare providers will, however, need to expend a lot of time and effort to ensure that the MAT ultimately achieves these ultimate goals. More detailed quantitative and qualitative research, sustained by a core healthcare theory, will be necessary to overcome the threats to internal and external validity, which limited the findings of the current study.

References

Adler, A. & Seligman, M. E. P. (2016). Using well-being for public policy: theory, measurement, and recommendations. *International Journal of Wellbeing, 6*(1), 1–35.

Aggrawal, A. (1995). *Narcotic Drugs.* India: National Book Trust.

Albrecht, G.L. & Devlieger, P.J., (1999). The disability paradox: high quality of life against all odds. *Soc Sci Med., 48*: 977-988.

Alderks, C.E., (August 22, 2017). Trends in the Use of Methadone, Buprenorphine, and Extended-release Naltrexone at Substance Abuse Treatment Facilities: 2003- 2015 (Update). The CBHSQ Report. Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Rockville, MD.

Allison, P. J., Locker, D., & Feine, J. S. (1997). Quality of life: A dynamic construct. *Social Science & Medicine, 45*(2), 221–230.

Amato, L., Davoli, M., Perucci, C. A., Ferri, M., Faggiano, F., & Mattick, R. P. (2005). An overview of systematic reviews of the effectiveness of opioid maintenance therapies: Available evidence to inform clinical practice and research. *Journal of Substance Abuse Treatment, 28*(4), 321–329.

Amato, L., Minozzi, S., Davoli, M., Vecchi, S., Ferri, M., & Mayet, S. (2004). Psychosocial and pharmacological treatments versus pharmacological treatments for opioid detoxification. *Cochrane Database Systematic Review*,4.

Andersen, D., & Järvinen, M., (2007). Harm reduction-ideals and paradoxes. *Nordic Studies on Alcohol and Drugs, 24*, 235-252.

Anglin, M. D., Hser, Y. I., & Grella, C. E. (1998). Drug addiction and treatment careers among clients in DATOS. *Psychology of Additive Behavior, 11*(4), 308–323.

Anstice, S., Strike, C. J., & Brands, B. (2009). Supervised methadone consumption: Client issues and stigma. *Substance Use & Misuse, 44*(6), 794–808.

Astals, M., Domingo-Salvany, A., Castillo Buenaventura, C., Tato, J., Vazquez, J. M., Martín-Santos, R., & Torrens, M. (2008). Impact of substance dependence and dual diagnosis on the quality of life of heroin users seeking treatment. *Substance Use & Misuse, 43*(5), 612–632.

Atkinson, M., Zibin, S., & Chuang, H. (1997). Characterizing quality of life among patients with chronic mental illness: a critical examination of self-report methodology. *American Journal of Psychiatry*, 154, 99–105.

Avants, S. K., Margolin, A., Sindelar, J. L., Rounsaville, B. J., Schottenfeld, R., Stine, S., Cooney, N. L., Rosenheck, R. A., Li, S. H., & Kosten, T. R., (1999). Day treatment versus enhanced standard methadone services for opioid-dependent patients: a comparison of clinical efficacy and cost. *American Journal of Psychiatry, 156*(1), 27–33.

Bader, E. J. (2015, May). The Business of Recovery: Putting profits over people hurts public health. *The Truthout*. Retrieved from http://www.truth-out.org/opinion/item/30660-the-business-of-recovery-putting-profits-over-people-hurts-public-health.

Baharom, N., Hassan, M. R., Ali, N., & Shah, S. A. (2012). Improvement of quality of life following 6 months of methadone maintenance therapy in Malaysia. *Substance Abuse Treatment, Prevention, and Policy*, *7*, 32.

Banta-Green, C. J., (2015). Medication-assisted treatment for opioid use disorder: Overview of the evidence. *Alcohol & Drug Abuse Institute, University of Washington*.

Bao, Y, Liu, Z., Epstein, D. H., Du, C., Shi, J., & Lu, L. (2009). A meta-analysis of retention in methadone maintenance by dose and dosing strategy. *The American Journal of Drug and Alcohol Abuse, 35*(1), 28–33.

Bargagli, A. M., Hickman, M., Davoli, M., Perruci, C.A., Schifano, P., Buster, M., ... Vicente, J. (2005). Drug-related mortality and its impact on adult mortality in eight European countries. *The European Journal of Public Health, 16*(2), 198–202.

Barnett, A. G., Van der Pols, J. C., & Dobson, A. J. (2004). Regression to the mean: what it is and how to deal with it. *International Journal of Epidemiology, 34,* 215–220.

Barnett, P. G., & Hui, S. S. (2000). The cost-effectiveness of methadone maintenance. *The Mount Sinai Journal of Medicine, 67*(5-6), 365–374.

Barry, M., & Crosby, C. (1996). Quality of life as an evaluative measure in assessing the impact of community care on people with long-term psychiatric disorders. *British Journal of Psychiatry*, 168, 210–216.

Batki, S. L., Canfield, K. M., Smyth, E., & Ploutz-Snyder, R. (2009). Health related quality of life in methadone maintenance patients with untreated hepatitis C virus infection. *Drug Alcohol Dependence, 101*(3), 176–182.

The Betty Ford Institute Consensus Panel (2007). What is recovery? A working definition from the Betty Ford Institute. *Journal of Substance Abuse Treatment, 33*, 221–228.

Birnbaum, H. G., White, A. G., Schiller, M., Waldman, T., Cleveland, J. M., & Roland, C. L., (2011). Societal Costs of Prescription Opioid Abuse, Dependence and Misuse in the United States. *Pain Medicine, 12*, 657–667.

Bizzarri, J., Rucci, P., Vallotta, A., Girelli, M., Scandolari, A., Zerbetto, E., ... Dellantonio, E. (2005). Dual diagnosis and quality of life in patients in treatment for opioid dependence. *Substance Use & Misuse, 40*(12), 1765–1776.

Blanchflower, D.G., & Oswald, H.J., (2008). Is well-being U-shaped in the life cycle? *Social Science Med, 66*(8) 1733-1749.

Bland, J. M & Altman, D. G. (1994). Regression towards the mean. *British Medical Journal 308*, 1499.

Bonate, P.L. (2000) Analysis of pretest-posttest designs. London, UK: Chapman & Hall.

Bonhomme, J., Shim, R. S., Gooden, R., Tyus, D., & Rust, G. (2012). Opioid addiction and abuse in primary care practice: a comparison of methadone and buprenorphine as treatment options. *Journal of the National Medical Association, 104*(7-8), 342–350.

Bonomi, A. E., Patrick, D. L., Bushnell, D. M. & Martin, M. (2000). Quality of life measurement: Will we ever be satisfied? *Journal of Clinical Epidemiology, 53*(1), 19–23.

Bowling, A., & Brazier, J. (1995). 'Quality of life' in social science and medicine: Introduction. *Social Science & Medicine, 41*(10), 1337–1338.

Brauer, S. (2017, January 6). Inside a killer drug epidemic: A look at America's opioid crisis. *The New York Times*. Retrieved from https://www.nytimes.com/2017/01/06/us/opioid-crisis-epidemic.html.

Breslow, L. (2006). Health Measurement in the Third Era of Health. *American Journal of Public Health, 96*(1), 17–19.

Brocato, J., & Wagner, E. F. (2003). Harm reduction: A social work practice model and social justice agenda. *Health & Social Work, 28*(2), 117-125.

Broekaert, E., & Vanderplasschen, W. (2003). Towards the integration of treatment systems for substance abusers: Report on the second international symposium on substance abuse treatment and special target groups. *Journal of Psychoactive Drugs, 35*(2), 237–245.

Brown, B. S., & Flynn, P. M. (2015). In support of a national treatment evaluation study. *Substance Use & Misuse, 50*, 1051–1054.

Brown, I., Renwick, R., & Nagler, M. (1996). The centrality of quality of life in health promotion and rehabilitation. In Renwick, R., Brown, I., & Nagler, M. (Eds.), *Quality of Life in Health Promotion and Rehabilitation* (pp. 313). California: Sage Publications.

Brownstein, M. J. (1993). A brief-history of opioids, opioid-peptides, and opioid receptors. *Proceedings of the National Academy of Sciences of the United States of America*, *90*(12), 5391–5393.

Bruneau, J., Lamothe, F., Franco, E., Lachance, N., Désy, M., Soto, J., & Vincelette, J., (1997). High rates of HIV infection among injection drug users participating in needle exchange programs in Montreal: Results of a cohort study. *American Journal of Epidemiology, 146*(12), 994–1002.

Buchholz, A., Krol, A., Rist, F., Nieuwkerk, P. T., & Schippers, G. M. (2008). An assessment of factorial structure and health-related quality of life in problem drug users using the Short Form 36 Health Survey. *Quality of Life Research, 17*(7), 1021–1029.

Bukten, A., Skurtveit, S., Gossop, M., Waal, H., Stangeland, P., Havnes, I., & Clausen, T., (2012). Engagement with opioid maintenance treatment and reductions in crime: a longitudinal national cohort study. *Addiction,107*(2),393–399.

Butzer, B. & Campbell, L. (2008). Adult attachment, sexual satisfaction, and relationship satisfaction: A study of married couples. Personal Relationships, 15(1), 141–154.

Callaly, T., Trauer, T., Munro, L., & Whelan, G. (2001). Prevalence of psychiatric disorder in a methadone maintenance population. *Australian and New Zealand Journal of Psychiatry, 35*(5), 601–605.

Campbell, A. (1981). The sense of well-being in America: Recent patterns and trends. New York: Mcgraw-Hill.

Carpentier, P. J., Krabbe, P. F., Van Gogh, M. T., Knapen, L. J., Buitelaar, J. K., & De Jong, C.A., (2009). Psychiatric comorbidity reduces quality of life in chronic methadone maintained patients. *American Journal on Addictions, 18*(6), 470–480.

Carr, A. J., Gibson, B., & Robinson, P. G. (2001). Measuring quality of life – Is quality of life determined by expectations or experience? *British Medical Journal, 322*(7296), 1240–1243.

Carr, A. J., & Higginson, I. J. (2001). Are quality of life measures patient centered? *British Medical Journal, 322*(7298), 1357–1360.

Center for Behavioral Health Statistics and Quality. (2016). Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health. Substance Abuse and Mental Health Services Administration, Rockville, MD.

Center for Substance Abuse Treatment. (2005). Medication-Assisted Treatment for Opioid Addiction in Opioid Treatment Programs. Treatment improvement protocol (TIP) series, No. 43. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Center for Substance Abuse Treatment. (2005). National Summit on Recovery: Conference Report. DHHS Publication No. (SMA) 07-4276. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Center for Substance Abuse Treatment. (2004). Clinical guidelines for the use of buprenorphine in the treatment of opioid addiction. Treatment improvement protocol (TIP) series, No. 40. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Choi, B.C.K., & Pak, A.W.P. (2005). A catalog of biases in questionnaires. *Preventing Chronic Disease, 2(1),* A13. Retrieved from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1323316.

Compton, W. M., Jones, C. M. & Baldwin, G. T., (2016). Nonmedical Prescription-Opioid Use and Heroin Use. *New England Journal of Medicine, 374,* 1296.

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

Connery, H. S., (2015). Review for clinicians on medication-assisted treatment options. *Harvard Review of Psychiatry, 23*(2), 63–75.

Connock, M., Juarez-Garcia, A., Jowett, S., Frew, E., Liu, Z., Taylor, R. J., . . . Taylor, R. S., (2007). Methadone and buprenorphine for the management of opioid dependence: A systematic review and economic evaluation. *Health Technology Assessment, 11*(9), 1–171.

Connor, J. P., Saunders, J. B., & Feeney, G. F. X. (2006). Quality of life in substance use disorders. In Katschnig, H., Freeman, H., & Sartorius, N. (Eds.), *Quality of Life in Mental Disorders* (2nd Ed.) (pp. 199–208). West Sussex: John Wiley & Sons Ltd.

Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods (4th ed.).* Thousand Oaks, CA: Sage.

Cummins, R. A. (2005). Moving from the quality of life concept to a theory. *Journal of Intellectual Disability Research, 49*(10), 699–706.

Cummins, R. A., Lau, A., & Stokes, M. (2004). HRQoL and subjective wellbeing: Noncomplementary forms of outcome measurement. *Expert Review of Pharmacoeconomics & Outcomes Research, 4*(4), 413–420.

Cummins, R. A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research, 38*(3), 303–328.

Darke, S., & Hall, W. (2003). Heroin overdose: Research and evidence-based intervention. *Journal of Urban Health-Bulletin on the New York Academy of Medicine, 80*(2), 189–200.

Dart, R. C., Surratt, H. L., Cicero, T. J., Parrino, M. W., Severtson, S. G., Bucher-Bartelson, B., Green, J. L., (2015). Trends in opioid analgesic abuse and mortality in the United States. *New England Journal of Medicine, 372*, 241–248.

Davidson, L., Shahar, G., Lawless, M. S., Sells, S., & Tondora, J. (2006). Play, pleasure, and other positive life events: "Non-specific" factors in recovery from mental illness? *Psychiatry, 69*(2), 151–163.

Dazord, A., Mino, A., Page, D., & Broers, B. (1998). Patients on methadone maintenance treatment in Geneva. *European Psychiatry, 13*(5), 235–241.

Deering, D. E., Frampton, M. A., Horn, J., Sellman, J. D., Adamson, S. J., & Potiki, T. L. (2004). Health status of clients receiving methadone maintenance treatment using the SF-36 health survey questionnaire. *Drug and Alcohol Review, 23*(3), 273–280.

De Jong, C. A. J., Roozen, H. G., van Rossum, L. G. M., Krabbe, P. F. M., & Kerkhof, A. J. F. M. (2007). High abstinence rates in heroin addicts by a new comprehensive treatment approach. *The American Journal on Addictions, 16*(2), 124–130.

De Leo, J. & Earleywine, M. (2013). Life, drugs, and the making of meaning. In Hicks and Routledge, Eds. The Experience of Meaning in Life: Classical Perspectives, Emerging Themes, and Controversies. New York: Springer-Science.

De Maeyer, J., Vanderplasschen, W., & Broekaert, E. (2010). Quality of life among opioid-dependent individuals: A review of the literature. *International Journal of Drug Policy, 21*(5), 364–380.

De Maeyer, J., Vanderplasschen, W., & Broekaert, E. (2009). Exploratory study on drug users' perspectives on quality of life: More than health-related quality of life? *Social Indicators Research, 90*(1), 107–126.

Denning, P. (2001). Strategies for implementation of harm reduction in treatment settings. *Journal of Psychoactive Drugs, 33*(1), 23–26.

Denzin, N. K, & Lincoln, Y. (2008). *Strategies of qualitative inquiry* (3rd ed.). Thousand Oaks, Sage.

Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social, and subjective indicators. *Social Indicators Research, 40*(1-2), 189–216.

Diez-Roux A.V. (1998). Bringing context back into epidemiology: variables and fallacies in multilevel analysis. *American Journal of Public Health, 88*(2), 216–222.

Dimitrov, D. M., & Rumrill, P.D. (2003). Pretest-posttest designs and measurement of change. *Work, 20,* 159–165.

Dole, V. P. (1988) Implications of methadone maintenance for treating addiction. *Journal of the American Medical Association,* 260, 3025–3029.

Dole, V. P., & Joseph, H., (1978). Long-term outcomes of patients treated with methadone maintenance treatment. *Annals of the New York Academy of Science, 311*(1), 181–196.

Dole, V. P., & Nyswander, M.E. (1965). A medical treatment for diacetylmorphine (heroin) addiction. *JAMA – Journal of the American Medical Association, 193*(8), 646–650.

Dole, V.P. & Nyswander, M.E. (1966). Rehabilitation of heroin addicts after blockade with methadone. *New York State Journal of Medicine, 66*, 2011–2016.

Dole, V.P. & Nyswander, M.E. (1976). Methadone Maintenance Treatment: A ten-year perspective. *Journal of the American Medical Association,* 235, 2117–2119.

Donovan, D., Mattson, M. E., Cisler, R. A., Longabaugh, R., & Zweben, A. (2005). Quality of life as an outcome measure in alcoholism treatment research. *Journal on Study of Alcohol: Supplement, 15*,119-139, (92–93).

Drugs, Inc. (2010–2016), USA: National Geographic. Retrieved at http://channel.nationalgeographic.com/drugs-inc/.

Ducharme, L. J. & Abraham, A. J. (2008). State policy influence on the early diffusion of buprenorphine in community treatment programs. *Substance Abuse Treatment and Prevention Policy, 3*, 17.

Eklund, C., Melin, L., Hiltunen, A., & Borg, S. (1994). Detoxification from methadone maintenance treatment in Sweden: Long-term outcome and effects on quality of life and life situation. *The International Journal of the Addictions, 29*(5), 627–645.

Eland-Goossensen, A., van de Goor, I. A. M., & Garretsen, H. F. L. (1997). Heroin addicts in the community and in treatment compared for severity of problems and need for help. *Substance Use & Misuse, 32*(10), 1313–1330.

El-Guebaly, N., Carra, G., & Galanter, M., (Eds). (2015). *Textbook of Addiction Treatment: International Perspectives, Volume 1.* Springer Publishing: New York.

Enos, G. (2015, April). New documentary assails questionable ethics in addiction treatment industry. *Behavioral Healthcare Executive*. Retrieved from https://www.behavioral.net/article/new-documentary-assails-questionable-ethics-addiction-treatment-industry.

Farquhar, M. (1995). Definitions of quality of life: A taxonomy. *Journal of Advanced Nursing, 22*(3), 502–508.

Farrell, M., Gowing, L., Marsden, J., Ling, W., & Ali, R. (2005). Effectiveness of drug dependence treatment in HIV prevention. *International Journal of Drug Policy, 16*(Suppl. 1), 67–75.

Farrell, M., Ward, J., Mattick, R., Hall, W., Stimson, G. V., Jarlais, D. D., … Strang, J. (1994). Methadone maintenance treatment in opioid dependence: A review. *British Medical Journal, 309*(6960), 997–1001.

Fassino, S., Abbate Daga, G., Delsedime, N., Rogna, L., & Boggio, S. (2004). Quality of life and personality disorders in heroin abusers. *Drug and Alcohol Dependence, 76*(1), 73–80.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39,* 175-191.

Feelemyer, J., Des Jarlais, D., Arasteh, K., Abdul-Quader, A. S. & Hagan, H. (2014). Retention of participants in medication-assisted programs in low- and middle-income countries: an international systematic review. *Addiction, 109*(1), 20–32.

Fei, J. T. B., Yee, A., Habil, M. H. B. & Danaee, M. (2016). Effectiveness of methadone maintenance therapy and improvement in quality of life following a decade of implementation. Journal of Substance Abuse Treatment, 69,50–56.

Fellinghauer, B., Reinhardt, J.D., Stucki, G., Bickenbach, J., (2012). Explaining the disability paradox: a cross-sectional analysis of the Swiss general population. *BMC Public Health, 12*:655.

Ferguson, C. F. (2009). An effect size primer: a guide for clinicians and researchers. *Professional Psychology: Research and Practice, 40*, 532–538.

Fernandez, H. & Libby, T.A. (2011). *Heroin: It's history, pharmacology, and treatment.* Minnesota: Hazelden.

Fernández-Ballesteros, R., Díez-Nicolás, J., Caprara, G. V., Barbaranelli, C., & Bandura, A. (2002). Determinants and Structural Relation of Personal Efficacy to Collective Efficacy. *Applied Psychology, 51*, 107–125.

Field, A. P. (2013). *Discovering statistics using SPSS.* (4th ed.). Thousand Oaks, CA: Sage.

Finney, J. W. & Monahan, S. C. (1996). The cost-effectiveness of treatment for alcoholism: a second approximation. *Journal Study of Alcohol, 57*(3), 229–43.

Fischer, B., Rehm, J., Brissette, S., Brochu, S., Bruneau, J., El-Guebaly, N., . . . Baliunas, D. (2005). Illicit opioid use in Canada: Comparing social, health, and drug use characteristics of untreated users in five cities (OPICAN study). *Journal of Urban Health-Bulletin of the New York Academy of Medicine, 82*(2), 250–266.

Fischer, B., Rehm, J., Kim, G., & Kirst, M. (2005). Eyes wide shut? – A conceptual and empirical critique of methadone maintenance treatment. *European Addiction Research, 11*(1), 1-9.

Fischer, B., Haydon, E., Rehm, J., Kraiden, M., & Reimer, J. (2004). Injection drug use and the hepatitis C virus: Considerations for a targeted treatment approach – The case of Canada. *Journal of Urban Health-Bulletin of the New York Academy of Medicine,81*(3), 428–447.

Fischer, B., Chin, A.T., Kuo, I., Kirst, M., & Vlahov, D. (2002). Canadian illicit opioid users' views on methadone and other opioid prescription treatment: An exploratory qualitative study. *Substance Use & Misuse, 37*(4), 495-522.

Fischer, B., Rehm, J., & Kim, G. (2001). Whose quality of life is it, really? *British Medical Journal, 322*, 1357–1360.

Fiske, A. P. (1991). *Structures of Social Life: The Four Elementary Forms of Human Relations*. New York: Free Press.

Fletcher, A.M., (2013*). Inside Rehab: The surprising truth about addiction-and how to get help that works.* New York: Penguin Books.

Florence, C. S., Zhou, C., Luo, F. & Xu, L., (2016). The Economic Burden of Prescription Opioid Overdose, Abuse, and Dependence in the United States, 2013. *Medical Care*, *54*, 901–906.

Foster, J. H., Powell, J. E., Marshall, E. J. & Peters, T. J. (1999). Quality of life in alcohol-dependent subjects—a review. *Quality of Life Research, 8*(3), 255–261.

Frane, A. (2015). Are per-family Type I error rates relevant in social and behavioral science? *Journal of Modern Applied Statistical Methods, 14*, 12–23.

Garner, B. R., Scott, C. K., Dennis, M. L., & Funk, R. R. (2014). The relationship between recovery and health-related quality of life. *Journal of Substance Abuse Treatment, 47*(4), 293-298.

Geldman, A., Hill, J., & Yajima, M. (2012) Why we (usually) don't have to worry about multiple comparisons. *Journal of Research on Educational Effectiveness, 5*,189–211.

Gerdner, A. & Holmberg, A. (2000). Factors affecting motivation to treatment in severely dependent alcoholics. *Journal of Studies on Alcohol, 61*, 548–560.

Gerstein, D. R., & Harwood, H. J. (Eds.), (1990). *Treating Drug Problems. Volume 1. A study of the evolution, effectiveness, and financing of public and private drug treatment systems.* Washington, D.C.: National Academy Press.

Giacomuzzi, S., Kemmler, G., Ertl, M., & Riemer, Y. (2006). Opioid addicts at admission vs. slow-release oral morphine, methadone, and sublingual buprenorphine maintenance treatment participants. *Substance Use & Misuse, 41*(2), 223–244.

Giacomuzzi, S. M., Riemer, Y., Ertl, M., Kemmler, G., Rössler, H., Hinterhuber, H., & Kurz, M. (2005). Gender differences in health-related quality of life on admission to a maintenance treatment program. *European Addiction Research, 11*(2), 69–75.

Giacomuzzi, S.M., Riemer, Y., Ertl, M., Kemmler, G., Rössler, H., Hinterhuber, H., & Kurz, M. (2003). Buprenorphine versus methadone maintenance treatment in an ambulant setting: A health-related quality of life assessment. *Addiction, 98*(5), 693–702.

Giacomuzzi, S. M., Riemer, Y., Kemmler, G., Ertl, M., Richter, R., Rössler, H., & Hinterhuber, H. (2001). Buprenorphine versus methadone maintenance treatment in an ambulant setting: a health-related quality of life assessment. *Addiction, 98*(5), 693–702.

Gill, T. M. & Feinstein, A. R. (1994). A critical appraisal of the quality of quality-of-life measurements. *JAMA, 272*(8),619–626.

Glaser, G. (2015, May). The billion-dollar rehab racket that drains family savings. *The Daily Beast.* Retrieved from http://www.thedailybeast.com/articles/2015/05/02/the-million-dollar-rehab-racket-that-drains-family-savings.html.

Glass, G.V., Peckham, P.D., Sanders, J.R., (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of Educational Research*, 42(3), pp. 237 – 288.

Gossop, M., Stewart, D., Browne, N. & Marsden, J. (2002). Factors associated with abstinence, lapse or relapse to heroin use after residential treatment: protective effect of coping responses. *Addiction, 97*(10), 1259–1267.

Graham, K. & Gillis, K. (1999). The relationship between psychosocial well-being and alcohol and drug use following substance misuse treatment. *Substance Use and Misuse, 34*(9), 1199–1222.

Granfield, R., & Cloud, W. (2001). Social context and "natural recovery": The role of social capital in the resolution of drug-associated problems. *Substance Use & Misuse, 36*(11), 1543–1570.

Greenstein, R. A., Fudala, P. J., O'Brien, C. P. (1997). Alternative pharmacotherapies for opioid addiction. In J. H. Lowinson, P. Ruiz, R.B. Millman, J. G. Langrod (Eds.) *Substance Abuse: A Comprehensive Textbook* (pp. 415–425). Williams and Wilkins, Baltimore.

Grönbladh, L., Ohlund, L. S., Gunne, L. M. (1990). Mortality in heroin addiction: impact of methadone treatment. *Acta Psychiatrica Scandinavica,82*(3), 223–227.

Habrat, B., Chmielewska, K., Baran-Furga, H., Keszycka, B., & Taracha, E. (2002). Subjective quality of life in opioid-dependent patients before admission after six months and one-year participation in methadone program. *Przeglad Lekarski, 59*(4–5), 351–354.

Haslauer, E., Delmell, E.C., Keul, A., Blaschkyl, T., Prinz, T., (2015). Comparing subjective and objective quality of life criteria: a case study of green space and public transportation in Vienna Austria. *Social Indicators Research, 124*(3) 911-927.

Haug, N. A., Sorensen, J. L., Lollo, N. D., Gruber, V. A., Delucchi, K. L., & Hall, S. M. (2005). Gender differences among HIV-positive methadone maintenance patients enrolled in a medication adherence trial. *AIDS Care, 17*(8), 1022–1029.

Hawk, K. F., Vaca, F. E., & D'Onofrio, G. (2015). Reducing fatal opioid overdose: Prevention, treatment and harm reduction strategies. *The Yale Journal of Biology and Medicine, 88*(3), 235–245.

Hayhurst KP, Massie JA, Dunn G, Lewis SW, Drake RJ. (2014). Validity of subjective versus objective quality of life assessment in people with schizophrenia. *BMC Psychiatry,* 14:365.

Hegegaard, H., Chen, L.H., Warner, M., (2015). Drug poisoning involving heroin: United States 2000-2013. *NCHS Data Brief, 190*, 1-8.

Hedrich, D., Pirona, A., & Wiessing, L. (2008). From margin to mainstream: The evolution of harm reduction responses to problem drug use in Europe. *Drugs – Education Prevention and Policy, 15*(6), 503–517.

Heinz, A. J., Wu, J., Witkiewitz, K., Epstein, D. H., & Preston, K. L. (2009). Marriage and relationship closeness as predictors of cocaine and heroin use. *Addictive Behaviors, 34*(3), 258–263.

Higginson, I. J., & Carr, A. J. (2001). Measuring quality of life – Using quality of life measures in the clinical setting. *British Medical Journal, 322*(7297), 1297–1300.

Horvath, G. (Producer), Finberg, A. (Director). (2015). *The Business of Recovery*. USA: Spot Forty-Nine.

Hubbard, R., & Lindsay, R.M. (2008). Why p values are not a useful measure of evidence in statistical significance testing. *Theory & Psychology, 18*, 69-88.

Hser, Y., Saxon, A., Huang, D., Hasson, A., Thomas, C., Hillhouse, M., … Ling, W. (2014), Treatment retention among patients randomized to buprenorphine/naloxone compared to methadone in a multi-site trial. Addiction, 109: 79–87.

Hser, Y.I. (2007). Predicting long-term stable recovery from heroin addiction: Findings from a 33-year follow-up study. *Journal of Addictive Diseases, 26*(1), 51–60.

Hser, Y., Hoffman, V., Grella, C. E., & Anglin, M.D. (2001). A 33-year follow-up of narcotics addicts. *Archives of General Psychiatry, 58*(5), 503–508.

Hser, Y. (1988). Evaluation of drug abuse treatment. A repeated measures design assessing methadone maintenance. *Evaluation Review, 12*(5), 547–570.

Hubbard, R. L., Marsden, M. E., Rachel, J.V. & Harwood, H. J. (1990). *Drug abuse treatment: A national study of effectiveness.* Chapel Hill: University of North Carolina Press.

Hubbard, R. L., Craddock, S. G., & Anderson, J. (2003). Overview of 5-year follow-up outcomes in the drug abuse treatment outcome studies (DATOS). *Journal of Substance Abuse Treatment, 25*(3), 125–134.

Hunt, W. A., Barnett, L. W., Branch, L. G. (1971). Relapse rates in addiction programs. *Journal of Clinical Psychology, 27*(4), 455–456.

Hyland, M. E. (1998). Defining and measuring quality of life in medicine. *JAMA, 279*(6),429–431.

Idrovo, A. J. (2011). Three criteria for ecological fallacy. *Environmental Health Perspectives, 119 (8),* a332.

Institute of Medicine (US) Committee for the Substance Abuse Coverage Study; Gerstein DR, Harwood HJ, editors. Treating Drug Problems: Volume 1: A Study of the Evolution, Effectiveness, and Financing of Public and Private Drug Treatment Systems. Washington (DC): National Academies Press (US); 1990. PubMed PMID: 25144071.

Institute of Medicine (US) Committee on Federal Regulation of Methadone Treatment; Rettig RA, Yarmolinsky A, editors. Federal Regulation of Methadone Treatment. Washington (DC): National Academies Press (US); 1995. Available from: https://www.ncbi.nlm.nih.gov/books/NBK232108/ doi: 10.17226/4899.

Jacobs, P., Ang, A., Hillhouse, M. P., Saxon, A. J., Nielsen, S., Wakim, P. G., … Blaine, J. D., (2015). Treatment outcomes in opioid dependent patients with different buprenorphine/naloxone induction dosing patterns and trajectories. *The American Journal on Addictions, 24*(7), 667–675.

Jaffe, J. H. (1992). Current concepts of addiction. In C. P. O'Brien & J. H. Jaffe (Eds.), Research publications: Association for Research in Nervous and Mental Disease, Vol. 70. Addictive states (pp. 1–21). New York: Raven Press.

Janes, R. (2010). *Methadone: Bad boy of drug treatment: What works & want doesn't.* Parker, Colorado: Outskirts Press.

Järvinen, M. (2008). Approaches to methadone treatment: Harm reduction in theory and practice. *Sociology of Health Illness, 30*(7), 975–991.

Joe, G., Simpson, D. & Broome, K. (1999). Retention and patient engagement models of different treatment modalities in DATOS. *Drug and Alcohol Dependence, 57*, 113–125.

Jones, C. M., Paulozzi, L. J., Mack, K. A., & Centers for Disease Control and Prevention, (2014). Alcohol involvement in opioid pain reliever and benzodiazepine drug abuse-related emergency department visits and drug-related deaths - United States, 2010. *MMWR Morbidity and Mortality Weekly Report 63*, 881–885.

Jones, H. E., Arria, A. M., Baewert, A., Heil, S. H., Kaltenbach, K., Martin, P. R., … Fischer, G. (2012). Buprenorphine Treatment of Opioid-Dependent Pregnant Women: A Comprehensive Review. *Addiction, 107*(1), 5–27.

Jones, J. D., Mogali, S., & Comer, S.D., (2012). Polydrug abuse: A review of opioid and benzodiazepine combination use. *Drug Alcohol Dependence, 125*(1–2), 8–18.

Joseph, H., Stancliff, S., & Langrod, J. (2000). Methadone maintenance treatment (MMT): A review of historical and clinical issues. *Mount Sinai Journal of Medicine, 67*(5–6), 347–364.

Kandall, S. R., Doberczak, T. M., Jantunen, M., & Stein, J. (1999). The methadone-maintained pregnancy. *Clinical Perinatology, 26*(1), 173–83.

Karow, A., Verthein, U., Pukrop, R., Reimer, J., Haasen, C., Krausz, M., & Schäfer, I., (2011). Quality of life profiles and changes in the course of maintenance treatment among 1,015 patients with severe opioid dependence. Substance Use & Misuse, 46(6), 705–715.

Karow, A., Verthein, U., Krausz, M., & Schäfer, I. (2008). Association of personality disorders, family conflicts and treatment with quality of life in opioid addiction. *European Addiction Research, 14*(1), 38–46.

Kassel, J. D., Stroud, L. R., & Paronis, C. A. (2003). Smoking, Stress, and Negative Affect: Correlation, Causation, and Context Across Stages of Smoking. *Psychological Bulletin, 129*(2), 270–304.

Katschnig, H. (2006). How useful is the concept of quality of life in psychiatry? In Katschnig, H., Freeman, H., & Sartorius, N. (Eds.), *Quality of Life in Mental Disorders* (2nd Ed.) (pp. 3–17). West Sussex: John Wiley & Sons Ltd.

Katschnig, H., & Angermeyer, M. (1997). Quality of life in depression. *In Quality of Life in Mental Disorders* (eds. H. Katschnig, H. Freeman, & N. Sartorius), pp. 137–147. Chrichester: Wiley & Sons.

King, L. A., & Napa, C. K. (1998). What makes a life good? *Journal of Personality and Social Psychology, 75*(1), 156–165.

Knudsen, H. K., Abraham, A. J., & Oser, C. B. (2011). Barriers to the implementation of medication-assisted treatment for substance use disorders: the importance of funding policies and medical infrastructure. *Evaluation and Program Planning, 34*(4), 375–381.

Kobra, L., Maohammad, N., & Alireza, S. S. (2012). Quality of life in patients on methadone maintenance treatment: A three-month assessment. *Journal of the Pakistan Medical Association, 62* (10), 1003–1007.

Korcha, R.A., Polcin, D.L., Greenfield, T.K., Kerr, W.C., Bond, J., (2014). Pressure to Change Drinking Behavior: An Exploratory Analysis of U.S. General Population Subgroups. *Journal of Drug Issues, 44*(4), pp. 457 – 465.

Kreek, M. J., Borg, L., Ducat, E., & Ray, B. (2010). Pharmacotherapy in the treatment of addiction: Methadone. *Journal of Addictive Diseases, 29*(2), 200–216.

Kresina, T. F., Melinda, C., Lee, J., Ahadpour, M., & Robert, L. (2015). Reducing mortality of people who use opioids through medication-assisted treatment for opioid dependence. *Journal of HIV & Retro Virus, 1*(1).

Laudet, A. B. (2011). The Case for Considering Quality of Life in Addiction Research and Clinical Practice. *Addiction Science & Clinical Practice, 6*(1), 44–55.

Laudet, A.B. (2007). What does recovery mean to you? Lessons from the recovery experience for research and practice. *Journal of Substance Abuse Treatment, 33*(3), 243-256.

Laudet, A. B., Becker, J. B., & White, W.L. (2009). Don't wanna go through that madness no more: Quality of life satisfaction as predictor of sustained remission from illicit drug misuse. *Substance Use & Misuse, 44*(2), 227–252.

Laudet, A. B., Morgen, K., & White, W. L. (2006). The role of social supports, spirituality, religiousness, life meaning and affiliation with 12-step fellowships in quality of life satisfaction among individuals in recovery from alcohol and drug problems. *Alcoholism Treatment Quarterly, 24*(1-2), 33–73.

Laudet, A., Stanick, V. & Sands, B. (2007). The effect of onsite 12-step meetings on post-treatment outcomes among polysubstance-dependent outpatient clients. *Evaluation Review, 31*(6), 613–46.

Laudet, A. & White, W. (2008). Recovery capital as prospective predictor of sustained recovery, life satisfaction and stress among former poly-substance users. *Substance Use and Misuse, 43(1),* 27–54.

Lawrinson, P., Ali, R., Buavirat, A., Chiamwongpaet, S., Dvoryak, S., Habrat, B., … Zhao, C., (2008). Key findings from the WHO collaborative study on substitution therapy for opioid dependence and HIV/AIDS. *Addiction, 103*(9), 1484–1492.

Lehman, A. F. (1996). Measures of quality of life among persons with severe and persistent mental disorder. In *Mental Health Outcome Measures* (eds. G. Thornicroft & M. Tansella), pp. 75–92. Berlin: Springer.

Lenton, S., & Single, E. (1998). The definition of harm reduction. *Drug and Alcohol Review, 17*(2), 213–219.

Leri, F., Bruneau, J., & Stewart, J. (2003). Understanding polydrug use: Review of heroin and cocaine co-use. *Addiction, 98*(1), 7–22.

Linden, A. (2013). Assessing regression to the mean effects in health care initiatives. *BMC Medical Research Methodology,* 13, 119. Retrieved from: https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/1471-2288-13-119 doi: 10.1186/1471-2288-13-119

Lix, L. M., Keselman, J. C., & Keselman, H. J. (1996). Consequences of assumption violations revisited: A quantitative review of alternatives to the one-way analysis of variance F-test. Review of Educational Research, 66, 579–619.

Lofwall, M. R., Brooner, R. K., Bigelow, G. E., Kindbom, K., & Strain, E. C. (2005). Characteristics of older opioid maintenance patients. *Journal of Substance Abuse Treatment, 28*(3), 265-272.

Lowinson, J., Marion, I., Joseph, H., & Dole, V. (1992). Methadone maintenance. In J. Lowinson, P. Ruiz, R. Millman, & J. Langrod (Eds.), Substance abuse: A comprehensive textbook (pp. 550–561). Baltimore: Williams & Wilkins.

Magura, S., Laudet, A., Kang, S. Y., & Whitney, S. A. (1999). Effectiveness of comprehensive services for crack-dependent mothers with newborns and young children. *Journal of Psychoactive Drugs, 31*(4), 321–338.

March, J. C., Ovieda-Joeles, E., Perea-Milla, E. & Carraro, F. (2006). Controlled trial of prescribed heroin in the treatment of opioid dependence. *Journal of Substance Abuse Treatment, 31*, 2003–2011.

Maremmani, I., Pani, P. P., Pacini, M., & Perugi, G. (2007). Substance use and quality of life over 12 months among buprenorphine maintenance-treated and methadone maintenance-treated heroin-addicted patients. *Journal of Substance Abuse Treatment, 33*(1), 91–98.

Mark, T. L., Levit, K. R., Vandivort-Warren, R., Buck, J. A., & Coffey, R. M. (2011). Changes in U.S. Spending on Mental Health and Substance Abuse Treatment, 1986–2005, and Implications for Policy. *Health Affairs, 30*(2), 284–292.

Marketdata Enterprises, Inc. (August 2014). *U.S. Addiction Rehab Industry*. Retrieved from https://www.marketdataenterprises.com/wp-content/uploads/2014/01/Rehab-Industry-2014-TOC.pdf.

Marlatt, G. A., Blume, A. W., & Parks, G. A. (2001). Integrating harm reduction therapy and traditional substance abuse treatment. *Journal of Psychoactive Drugs, 33*(1), 13–21.

Marsch, L. A., Bickel, W. K., Badger, G. J., & Jacobs, E. A. (2005). Buprenorphine treatment for opioid dependence: The relative efficacy of daily, twice and thrice weekly dosing. *Drug and Alcohol Dependence, 77*(2), 195–204.

Marsden, E., & Torgerson, C. J. (2012). Single group, pre- and posttest research designs: Some methodological concerns. *Oxford Review of Education, 38(5),* 583–616.

Massam, B.H., (2002). Quality of life: public planning and private living. *Progress in Planning, 58,* 141–227.

Mattick, R. P., Breen, C., Kimber, J., & Davoli, M. (2014). Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence (Review). *Cochrane Database System Review, 2.*

Mattick, R. P., Breen, C., Kimber, J., & Davoli, M. (2009). Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence (Review). *Cochrane Database of Systematic Reviews, 3*.

May, H., Boe, E., & Boruch, R. F. (2003). The ecological fallacy in comparative and international educational research. *CRESP Research Report*. Retrieved from: https://repository.upenn.edu/gse_pubs/410.

Maxwell, J. (2015). Substance Abuse Trends in Texas: June 2015. *University of Texas at Austin School of Social Work.* Retrieved from: https://socialwork.utexas.edu/dl/files/cswr/institutes/ari/pdf/trends/trends615.pdf.

McHugh, R. K., Hearon, B. A., & Otto, M. W. (2010). Cognitive-Behavioral Therapy for substance use disorders. *Psychiatric Clinics North America 33(3),* 511–525.

McKay, J. R. & Hiller-Sturmhöfel, S. (2005). Treating alcoholism as a chronic disease: Approaches to long-term continuing care. Alcohol Research and Health, 33(4), 356–370.

McKeganey, N. (2005). Abstinence and harm reduction: Two roads to one destination? *Drugs – Education Prevention and Policy, 12*(4), 251–253.

McLellan, A.T. (2002). Have we evaluated addiction treatment correctly? Implications from a chronic care perspective. *Addiction, 97*(3), 249–252.

McLellan, A. T., Luborsky, L., Woody, G. E., & O'Brien, C. P., (1980). An improved diagnostic instrument for substance abuse patients: The Addiction Severity Index. *Journal of Nervous & Mental Diseases,* 168, 26–33.

McLellan, A.T., McKay, J.R., Forman, R., Cacciola, J. & Kemp, J. (2005). Reconsidering the evaluation of addiction treatment: from retrospective follow-up to concurrent recovery monitoring. Review. *Addiction, 100*(4), 447–458.

McLellan, A.T., Lewis, D.C., O'Brien, C.P., & Kleber, H.D. (2000). Drug dependence, a chronic medical illness. Implications for treatment, insurance, and outcomes evaluation. *JAMA – Journal of the American Medical Association, 284*(13), 1689-1695.

McLellan, A. T., Arndt, I. O., Metzger, D. S., Woody, G. E., & O'Brien, C. P. (1993). The effects of psychosocial services in substance-abuse treatment. *JAMA – Journal of the American Medical Association, 269*(15), 1953–1959.

Melnick, G., Hawke, J., & De Leon, G. (2014). Motivation and readiness for drug treatment: differences by modality and special populations. *Journal of Addictive Diseases, 33*(2), 134–147.

Merriam, S. (2014). *Qualitative research: A guide to design and implementation.* San Francisco, CA: Jossey-Bass.

Meyer, R., Patel, A. M., Rattana, S. K., Quock, T. P., & Mody, S. H. (2014). Prescription Opioid Abuse: A Literature Review of the Clinical and Economic Burden in the United States. *Population Health Management, 17*(6), 372–387.

Michie, S., Van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science,* 6, 42. doi: 10.1186/1748-5908-6-42.

Miller, R. J., & Tran, P. B. (2000). More mysteries of opium revealed: 300 years of opioids. *Trends in Pharmacological Sciences, 21*(8), 299–304.

Millson, P. E., Challacombe, L., Villeneuve, P. J., Strike, C. J., Fischer, B., Myers, T., … Hopkins, S. (2006). Determinants of health-related quality of life of opioid users at entry to low-threshold methadone programs. *European Addiction Research, 12*(2), 74–82.

Millson, P. E., Challacombe, L., Villeneuve, P. J., Fischer, B., Strike, C. J., Myers, T., … Pearson, M. (2004). Self-perceived health among Canadian opioid users. A comparison to the general population and to other chronic disease populations. *Canadian Journal of Public Health,95*(2), 99–103.

Mitchell, S. G., Gryczynski, J., Kelly, S. M., O'Grady, K. E., Jaffe, J. H., Olsen, Y. K., & Schwartz, R. P. (2015). Treatment Outcomes of African American Buprenorphine Patients by Parole and Probation Status. *Journal of Drug Issues, 44*(1), 69–82.

Mojtabai, R. & Zivin, J.G. (2003). Effectiveness and cost-effectiveness of four treatment modalities for substance disorders: A propensity score analysis. *Health Services Research, 38*(1), 233–259.

Mooney, A. (2006). Quality of life: Questionnaires and questions. *Journal of Health Communication, 11*(3), 327–341.

Moons, P., Budts, W., & De Geest, S. (2006). Critique on the conceptualization of quality of life: A review and evaluation of different conceptual approaches. *International Journal of Nursing Studies, 43*(7), 891–901.

Morton, V., & Torgerson, D. J. (2003). Effect of regression to the mean on decision making in health care. *British Medical Journal*, 326, 1083–1084.

Muldoon M., Barger S., Flory J., & Manuck S. (1998). What are quality of life measurements measuring? *British Medical Journal*, 316, 542–545.

Muller, A. E., Skurtveit, S. & Clausen, T. (2016). Many correlates of poor quality of life among substance users entering treatment are not addiction specific. Health and Quality of Life Outcomes, 14, 39.

Munro, D. (2015, April 27). Inside the $35 billion addiction treatment industry. *Forbes*. Retrieved from https://www.forbes.com/forbes/welcome/?toURL=https://www.forbes.com/sites/danmunro/2015/04/27/inside-the-35-billion-addiction-treatment-industry/&refURL=https://www.google.com/&referrer=https://www.google.com/.

Musto, D., (1999). *The American Disease: The Origins of Narcotic Control. 3rd Edition*. New York: Oxford University Press.

Nakagawa, S. (2004). A farewell to Bonferroni: the problems of low statistical power and publication bias. *Behavioral Ecology, 15 (6),*1044–1045.

National Center on Addiction and Substance Abuse at Columbia University (CASA), (2012). Addiction Medicine—Closing the gap between science and medicine.

National Institute on Drug Abuse (NIDA). (2016). DrugFacts: Treatment approaches for drug addiction. Retrieved from http://www.drugabuse.gov/publications/drugfacts/treatment-approachesdrug-addiction.

National Institute on Drug Abuse (NIDA). (2015). Overdose death rates. Retrieved from http://www. drugabuse.gov/related-topics/trends-statistics/overdose-death-rates.

National Institute on Drug Abuse (NIDA). (2012a). Principles of Drug Addiction Treatment: A research-based guide (Third Edition). https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition.

National Institute on Drug Abuse (2012b). Evidence Based Treatment in Real World Setting: A National Advisory Council on Drug Abuse Report. Retrieved from: https://www.drugabuse.gov/sites/default/files/files/evidence-based_treatments_in_real_world_settings_workgroup_report.pdf.

National Institute on Drug Abuse (NIDA). (1999; reprinted 2000). Principles of drug addiction treatment: A research-based guide (NIH Publication No. 00–4180). Bethesda, MD: National Institutes of Health.

National Institutes of Health (1995). Medications Development for the Treatment of Pregnant Addicts and Their Infants. National Institute on Drug Abuse Research Monograph Series, No.149.

Neale, J., Sheard, L., & Tompkins, C. (2007). Factors that help injecting drug users to access and benefit from services: A qualitative study. *Substance Abuse Treatment, Prevention, and Policy, 2*(31).

Neale, J., Allen, D., & Coombes, L. (2005). Qualitative research methods within the addictions. *Addiction, 100*(11), 1584-1593.

Neaigus, A., Miller, M., Friedman, S. R., Hagen, D.L., Sifaneck, S. J., Ildefonso, G., des Jarlais, D.C., (2001). Potential risk factors for the transition to injecting among non-injecting heroin users: a comparison of former injectors and never injectors. *Addiction, 96*(6), 847–860.

Nuzzo, R. (2014). Scientific method: statistical errors. P values, the 'gold standard' of statistical validity, are not as reliable as many scientists assume. *Nature*, 506, 150-152.

O'Brien, S., Mattick, R. P., White, J., Breen, C., Kimber, J., Ritter, A., & Lintzeris, N. (2006). Maintenance pharmacotherapy for opioid dependence and SF-36 health status: A comparison with general population norms and other chronic disorders. *Addictive Disorders & Their Treatment, 5*(4), 155–164.

O'Brien, C. P., & McLellan, A.T. (1996). Myths about the treatment of addiction. *Lancet, 347*(8996), 237–240.

O'Keefe, D. (2003). Should familywise alpha be adjusted? *Human Communication Research, 29*(3), 431–447.

Ouellet, L. J., Wiebel, W. W., & Jimenez, A. D., (1995). Team research methods for studying intranasal heroin use and its HIV risks. *NIDA Research Monogram, 157*, 182–211.

Padaiga, Z., Subata, E., & Vanagas, G. (2007). Outpatient methadone maintenance treatment program quality of life and health of opioid dependent persons in Lithuania. *Medicina (Kaunas), 43*(3), 235–241.

Pan, S., Jiang, H., Du, J., Chen, H., Li, Z., Ling, W., & Zao, M. (2015). Efficacy of cognitive behavioral therapy on opiate use and retention in methadone maintenance treatment in China: a randomised trial. *PLoS ONE 10(6).*

Pathan, H., & Williams, J. (2012). Basic opioid pharmacology: An update. *British Journal of Pain, 6*(1), 11–16.

Patrick, D. L., and Erickson, P. (1993). Assessing health related quality of life for clinical decision making. In Walker, S. R., and Rosser, R. M. (Eds.) *Quality of life assessment: Key issues in the 1990s.* Dordrecht: Kluwer Academic Publishers.

Perneger, T. V. (1998). What's wrong with Bonferroni adjustments. *British Medical Journal, 316*, 1236–1238.

Pew Research Center (2015). *Substance Use Disorder and the Role of the States.* Washington, D.C. Retrieved from: http://www.pewtrusts.org/~/media/assets/2015/03/substanceusedisordersandtheroleofthestates.pdf

Polcin, D. & Weisner, C. (1999). Factors associated with coercion in entering treatment for alcohol problems. *Drug and Alcohol Dependence, 54*, 63–68.

Pollini, R. A., Banta-Green, C. J., Cuevas-Mota, J., Metzner, M., Teshale, E., & Garfein, R. S., (2011). Problematic use of prescription-type opioids prior to heroin use among young heroin injectors. *Substance Abuse Rehabilitation, 2*(1),173–180.

Ponizovsky, A. M., & Grinshpoon, A. (2007). Quality of life among heroin users on buprenorphine versus methadone maintenance. *The American Journal of Drug and Alcohol Abuse, 33*(5), 631–642.

Potik, D., Adelson, M., & Schreiber, S., (2007). Drug addiction from a psychodynamic perspective: methadone maintenance treatment (MMT) as transitional phenomena. *Psychological Psychotherapy, 80*(2)3, 11–25.

Préau, M., Protopopescu, C., Spire, B., Sobel, A., Dellamonica, P., Moatti, J.P., Carrieri, M.P., (2007). Health related quality of life among both current and former injection drug users who are HIV-infected. *Drug and Alcohol Dependence, 86*(2-3), 175–182.

Puigdollers, E., Domingo-Salvany, A., Brugal, M. T., Torrens, M., Alvarós, J., Castillo, C., … Vazquez, J. M. (2004). Characteristics of heroin addicts entering methadone maintenance treatment: Quality of life and gender. *Substance Use & Misuse, 39*(9), 1353–1368.

Radcliffe, P., & Stevens, A. (2008). Are drug treatment services only for 'thieving junkie scumbags'? Drug users and the management of stigmatized identities. *Social Science & Medicine, 67*(7), 1065–1073.

Rahman, S., & Majumber, A. Z. (2013). Qualitative research in medicine and healthcare. *South East Asia Journal of Public Health, 3*, 69–71.

Rapley, M. (2003). *Quality of life research: A critical introduction.* London: Sage Publications.

Reno, R. R., & Aiken, L. S. (1993). Life activities and life quality of heroin addicts in and out of methadone treatment. *The International Journal of the Addictions, 28*(3), 211–232.

Rettig, R.A., & Yarmolinsky, A., (eds.). (1995). Federal Regulation of Methadone treatment. Institute of Medicine: Washington D.C.

Ries, R. K., Fiellin, D. A., Miller, S. C., & Saitz, R. (2014). *The ASAM principles of addiction medicine: Fifth edition*. Wolters Kluwer Health Adis (ESP).

Roback, J. (1982). Wages, rents, and the quality of life. *The Journal of Political Economy, 90*(6), 1257–1278.

Roe, G. (2005). Harm reduction as paradigm: Is better than bad good enough? The origins of harm reduction. *Critical Public Health, 15(3*), 243–250.

Rooney, S., Freyne, A., Kelly, G., & O'Connor, J. (2002). Differences in the quality of life of two groups of drug users. *Irish Journal of Psychological ,19,* 55–59.

Rosen, D., Smith, M. & Reynolds, C.F. (2007). The prevalence of mental and physical health disorders among older methadone patients. *American Journal of Geriatric Psychiatry, 16*(6), 488–492.

Rosenbaum, M., Washburn, A., Knight, K., Kelley, M., & Irwin, J. (1996). Treatment as harm reduction, defunding as harm maximization: The case of methadone maintenance. *Journal of Psychoactive Drugs, 28*(3), 241–249.

Rosenberg, L. (2014, October 17). Addictions emerge as the nation's #1 public health crisis [Web log post]. Retrieved from https://www.behavioral.net/article/addictions-emerge-nations-1-public-health-crisis.

Rounsaville, B. J., & Kleber, H. D. (1985). Untreated opioid addicts. How do they differ from those seeking treatment? *Archives of General Psychiatry, 42*(11), 1072–1077.

Rudd, R. A., Seth, P., David, F. & Scholl, L. (2016). Increases in Drug and Opioid-Involved Overdose Deaths — United States, 2010–2015. *MMWR Morbidity Mortality Weekly Report. 65*, 1445–1452.

Rudolf, H., & Watts, J. (2002). Quality of life in substance abuse and dependency. *International Review of Psychiatry, 14*(3), 190–197.

Ruefli, T., & Rogers, S. J. (2004). How do drug users define their progress in harm reduction programs? Qualitative research to develop user-generated outcomes. *Harm Reduction Journal, 1*, 1–8.

Rush, B. R. & Wild, T. C. (2003). Substance abuse treatment and pressures from the criminal justice system: Data from a provincial client monitoring system. *Addiction, 98*, 1119–1128.

Ryan, C. F., & White, J. M. (1996). Health status at entry to methadone maintenance treatment using the SF-36 health survey questionnaire. *Addiction, 91*(1), 39–45.

Ryan, R.M., & Deci, E.L., (2001). On happiness and human potentials: a review of the research on hedonic and eudemonic well-being. *Annual Review of Psychology, 52* 141-163.

Saunders, K. W., Von Korff, M., Campbell, C. I., Banta-Green, C. J., Sullivan, M. D., Merrill, J. O., & Weisner, C., (2012). Concurrent use of alcohol and sedatives among persons prescribed chronic opioid therapy: prevalence and risk factors. *Journal of Pain,13*(3), 266–275.

Saxon, A. J., Hser, Y. I., Woody, G., & Ling, W. (2013). Medication-assisted treatment for opioid addiction: methadone and buprenorphine. *Journal of Food and Drug Analysis*, *21*(4), 569–572.

Schalock, R. (2005). Quality of life: Introduction and overview. *Journal of Intellectual Disability Research, 49*(10), 695–698.

Schalock, R., & Verdugo, M.A. (2002). *Handbook on quality of life for human service practitioners.* Washington: American Association on Mental Retardation.

Schalock, R. L, Brown, I., Brown, R., Cummins, R. A., Felce, D., Matikka, L., Keith, K. D., Parmenter, T., (2002). Conceptualization, measurement, and application of quality of life for persons with intellectual disabilities: Report of an international panel of experts. *Mental Retardation, 40*(6), 457–470.

Schalock, R. (1996). *Quality of life. Volume 1: Conceptualization and measurement.* Washington: American Association on Mental Retardation.

Schildhaus, S. (2015). The evaluation of substance user treatment—A jubilee proposal for the 21st century. *Substance Use and Misuse, 50*(8-9), 1055–1057.

Sederer, L. (2015, June 1). A blind eye to addiction. *U.S. News*. Retrieved from https://www.usnews.com/opinion/blogs/policy-dose/2015/06/01/america-is-neglecting-its-addiction-problem.

Seligman, M. E. P. (2008). Positive Health. *Applied Psychology, 57,* 3–18.

Senbanjo, R., Wolff, K., & Marshall, J. (2006). Excessive alcohol consumption is associated with reduced quality of life among methadone patients. *Addiction, 102*(2), 257-263.

Sheedy, C. K. & Whitter, M. (2009). Guiding Principles and Elements of Recovery-Oriented Systems of Care: What Do We Know from the Research? HHS Publication No. (SMA) 09-4439. Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.

Simpson, D. D. (1997). Effectiveness of drug-abuse treatment: A review of research from field settings. In Egertson, J. A., Fox, D. M., & Leshner, A. I. (Eds.), *Treating drug abusers effectively*. Cambridge, MA: Blackwell Publishers of North America.

Skantze, K., Wanke, M., & Bless, H. (1994). Subjective assessment and evaluations of time: some lessons from social cognitive research. In *European Review of Social Psychology* (eds W. Stroebe & M. Hewstone), pp. 181–210. New York: John Wiley & Sons.

Smith, E. (March 2016). Greek Mythology is a Big Supporter of your pain med addiction. Retrieved from: http://factorialist.com/greek-mythology-pain-meds/.

Stajduhar, K. I., Funk, L., Shaw, A. L., Bottorff, J. L., & Johnson, J. (2009). Resilience from the perspective of the illicit injection drug user: An exploratory descriptive study. *International Journal of Drug Policy, 20*(4), 309–316.

Stark, M. J. and Campbell, B. K., (1991). A psychoeducational approach to methadone maintenance treatment: A survey of client reactions. *Journal of Substance Abuse Treatment, 8*(3), 125–131.

Stein, B.D., (2011). The impact of buprenorphine on treatment of opioid dependence in a Medicaid population: recent service utilization trends in the use of buprenorphine and methadone. *Drug Alcohol Dependence, 123*(1-3), 72–88.

Stiglitz, J. E., Sen, A. & Fitoussi, J. P. (2010). *Mismeasuring our lives: Why GDP doesn't add up.* New York: The New Press.

Strain, E. C. & Stilzer, M. L. (Eds). (2005). *The Treatment of Opioid Dependence.* Baltrum, Maryland: John Hopkins University Press.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.

Substance Abuse and Mental Health Services Administration. (2017). *Key substance use and mental health indicators in the United States: Results from the 2016 National Survey on Drug Use and Health* (HHS Publication No. SMA 17-5044, NSDUH Series H-52). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from https://www. samhsa.gov/data/

Substance Abuse and Mental Health Services Administration, National Survey of Substance Abuse Treatment Services (N-SSATS). (2015a). *Data on Substance Abuse Treatment Facilities*. (BHSIS Series S-88, HHS Publication No. (SMA) 17-5031). Rockville, MD: Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. (2015b). Treatment Episode Data Set (TEDS): 2004-2014. National Admissions to Substance Abuse Treatment Services. BHSIS Series S-84, HHS Publication No. (SMA) 16-4986. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2015c). *Federal Guidelines for Opioid Treatment Programs*. (HHS Publication No. (SMA) PEP15-FEDGUIDEOTP). Rockville, MD: Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2015d). Clinical Use of Extended-Release Injectable Naltrexone in the Treatment of Opioid Use Disorder: A Brief Guide. HHS Publication No. (SMA) 14-4892R. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2014a). Projections of National Expenditures for Treatment of Mental and Substance Use Disorders, 2010–2020. HHS Publication No. SMA-14-4883. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2014b). Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings, NSDUH Series H-48, HHS Publication No. (SMA) 14-4863. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2014c). Medicaid Coverage and Financing of Medications to Treat Alcohol and Opioid Use Disorders. Retrieved from: http://store.samhsa.gov/shin/content//SMA14-4854/SMA14-4854.pdf

Substance Abuse and Mental Health Services Administration. (2014d) “Treatment Episode Data Set (TEDS), 2002-2012: National Admissions to Substance Abuse Treatment Services. Retrieved from: http://archive.samhsa.gov/data/2k14/TEDS2012NA/TEDS2012N_Web.pdf.

Substance Abuse and Mental Health Services Administration. (2013). National Expenditures for Mental Health Services & Substance Abuse Treatment 1986–2009. Retrieved from: http://store.samhsa.gov/shin/content/SMA13-4740/SMA13-4740.pdf.

Substance Abuse and Mental Health Services Administration. (2013). 2011 Opioid Treatment Program Survey: Data on Substance Abuse Treatment Facilities with OTPs. BHSIS Series S-

65, HHS Publication No. (SMA) 14-4807. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2008). Results from the 2007 National Survey on Drug Use and Health: National Findings (Office of Applied Studies, NSDUH Series H-34, DHHS Publication No. SMA 08-4343). Rockville, MD.

Tavakol, M., & Dennick, R. (2011). *Making sense of Cronbach's alpha*. *International Journal of Medical Education, 2,* 53–55.

Testa, M. A., & Simonson, D. C., (1996). Assessment of quality-of-life outcomes. *New England Journal of Medicine, 334*(13), 835–840.

Tiffany, S. T., Friedman, L., Greenfield, S. F., Hasin, D. S., & Jackson, R. (2012). Beyond drug use: a systematic consideration of other outcomes in evaluations of treatments for substance use disorders. Addiction, 107(4), 709–718.

Torrens, M., San, L., Martinez, A., Castillo, C., Domingo-Salvany, A., & Alonso, J. (1997). Use of the Nottingham health profile for measuring health status of patients in methadone maintenance treatment. *Addiction, 92*(6), 707–716.

Uchino, B. (2004). *Social Support and physical health: Understanding the health consequences of relationships.* New Haven: Yale University Press.

U.S. Department of Health and Human Services (HHS), Office of the Surgeon General, (2016). Facing Addiction in America: The Surgeon General’s Report on Alcohol, Drugs, and Health. Washington, D.C.: HHS.

Vacha-Haase, T. (2001). Statistical significance should not be considered as one of life's guarantees. Effect sizes are needed. Educational and Psychological Measurement, 61, 219-224.

Valderas, J. M., Kotzeva, A., Espallargues, M., Guyatt, G., Ferrans, C.E., Haylard, M.Y., … Alonso, J. (2008). The impact of measuring patient reported outcomes in clinical practice: A systematic review of the literature. *Quality of Life Research, 17*(10), 179–193.

van den Bos, G.A.M., & Triemstra, A.H.M. (1999). Quality of life as an instrument for need assessment and outcome assessment of health care in chronic patients. *Quality in Health Care, 8*(4), 247–252.

van den Brink, W., & Haasen, C. (2006). Evidenced-based treatment of opioid dependent patients. *Canadian Journal of Psychiatry, 51*(10), 635–646.

van den Brink, W., Goppel, M., & van Ree, J.M. (2003). Management of opioid dependence. *Current Opinion in Psychiatry, 16*(3), 297–304.

van Gennep, A., (1997). Quality of Community Living in the Netherlands. *The British Journal of Development Disabilities, 62*(1), 1–14.

Vanderplasschen, W., Rapp, R. C., Wolf, J., & Broekaert, E. (2004). The development and implementation of case management for substance use disorders in North America and Europe. *Psychiatric Services, 55*(8), 913–922.

Verrando, R., Robaeys, G., Mathei, C., & Buntinx, F. (2005). Methadone and buprenorphine maintenance therapies for patients with hepatitis C virus infected after intravenous drug use. *Acta Gastro-Enterologica Belgica, 68*(1), 81–85.

Vignau, J., & Brunelle, E. (1998). Differences between general practitioner and addiction centre-prescribed buprenorphine substitution therapy in France. *European Addiction Research, 4*(1), 24–28.

Villeneuve, P. J., Challacombe, L., Strike, C. J., Myers, T., Fischer, B., Shore, R., … Millson, P. E. (2006). Change in health-related quality of life of opioid users in low-threshold methadone programs. *Journal of Substance Use, 11*(2), 137–149.

Volkow, N., (2015, January 27). Why do our brains become addicted? Retrieved from https://www.youtube.com/watch?v=Mnd2-al4LCU

Volkow, N. D., Frieden, T. R., Hyde, P. S., & Cha, S. S. (2014). Medication-assisted therapies—tackling the opioid-overdose epidemic. *New England Journal of Medicine, 370*(22), 2063-2066.

Volkow, N. D., & Morales, M. (2015). The Brain on Drugs: From Reward to Addiction. *Cell, 162*(4), 712–725.

Walsh, S. L. & Eissenberg, T. (2003). The clinical pharmacology of buprenorphine: extrapolating from the laboratory to the clinic. *Drug Alcohol Dependence,70,* 513–527.

Ward, J., Hall, W., & Mattick, R.P. (1999). Role of maintenance treatment in opioid dependence. *The Lancet, 353*(9148), 221–226.

Weeks, D. L. (2007). The regression effect as a neglected source of bias in nonrandomized intervention trials and systematic reviews of observational studies. *Evaluation and the Health Professions, 30,* 254–265.

Whelan, P. J. & Remski, K. (2012). Buprenorphine vs methadone treatment: A review of evidence in both developed and developing worlds. *Journal of Neuroscience Rural Practice, 3*(1), 45–50.

White, W. (2015a). Recovery Monographs, Volume I. Bloomington, IN: Author House.

White, W. (2015b). Recovery Monographs, Volume II. Bloomington, IN: Author House.

White, W. (2015c). Toward a recovery research agenda: An interview with Dr. Alexandre Laudet. Posted at www.williamwhitepapers.com.

White, W. (2011). Narcotics Anonymous and the pharmacotherapeutic treatment of opioid addiction. Chicago, IL: Great Lakes Addiction Technology Transfer Center, Philadelphia Department of Behavioral Health and Intellectual Disability Services.

White, W. (1999). A lost world of addiction treatment. *Counselor, 17*(2), 8–11.

White, W. (1998, 2014). *Slaying the dragon: The history of addiction treatment and recovery in America (2nd ed.).* Bloomington, IL: Chestnut Health Systems/Lighthouse Institute.

Wiklund, I. (2004). Assessment of patient-reported outcomes in clinical trials: The example of health-related quality of life. *Fundamental & Clinical Pharmacology, 18*(3), 351–363.

Winklbaur, B., Jagsch, R., Ebner, N., Thau, K., & Fischer, G. (2008). Quality of life in patients receiving opioid maintenance therapy. *European Addiction Research, 14*(2), 99–105.

Woody, G.E., Bruce, D., Korthuis, P.T.,Chhatre, S., Poole, S., Hillhouse, M.,…Ling, W., (2014). HIV risk reduction with buprenorphine-naloxone or methadone: findings from a randomized trial. *Journal Acquired Immune Deficiency Syndrome, 66*(3), 288–293.

World Health Organization (2009). *Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence.* Geneva: World Health Organization.

World Health Organization (WHO/UNODC/UNAIDS) (2004). *Position paper. Substitution maintenance therapy in the management of opioid dependence and HIV/AIDS prevention.* Geneva: World Health Organization.

World Health Organization. (2017). WHOQoL: Measuring Quality of Life. Retrieved from: http://www.who.int/healthinfo/survey/whoqol-qualityoflife/en/.

Young, J. (2007). Statistical errors in medical research - a chronic disease. *Swiss Medical Weekly, 137, 41-43.*

Zodpey, S. P. (2004). Sample size and power analysis in medical research. *Research Methodology, 70*, 123–128.

Zubaran, C., & Foresti, K. (2009). Quality of life and substance use: Concepts and recent tendencies. *Current Opinion in Psychiatry*, *22*(3), 281–286.

Appendix A

Health, Wellness & Quality of Life Questionnaire

Answer each of the questions below by putting a circle around the number that best represents you at this time.

Case Number: _____

I. Physical State

Date: _____

Rate the following questions with respect to frequency:

	Never	Rarely	Occasionally	Regularly	Constantly
1. Presence of physical pain (neck/back ache, sore arms/legs, etc.).	1	2	3	4	5
2. Feeling of tension or stiffness or lack of flexibility in your spine.	1	2	3	4	5
3. Incidence of fatigue or low energy.	1	2	3	4	5
4. Incidence of colds and flu.	1	2	3	4	5
5. Incidence of headaches (of any kind).	1	2	3	4	5
6. Incidence of nausea or constipation.	1	2	3	4	5
7. Incidence of menstrual discomfort.	1	2	3	4	5
8. Incidence of allergies or skin rashes.	1	2	3	4	5
9. Incidence of dizziness or light-headedness.	1	2	3	4	5
10. Incidence of accidents or near accidents or falling or tripping.	1	2	3	4	5

II. Mental/Emotional State

Rate the following questions with respect to frequency:

	Never	Rarely	Occasionally	Regularly	Constantly
1. If pain is present, how distressed are you about it?	1	2	3	4	5
2. Presence of negative or critical feelings about your self.	1	2	3	4	5
3. Experience of moodiness or temper or angry outbursts.	1	2	3	4	5
4. Experience of depression or lack of interest.	1	2	3	4	5
5. Being overly worried about small things.	1	2	3	4	5
6. Difficulty thinking or concentrating or indecisiveness.	1	2	3	4	5
7. Experience of vague fears or anxiety.	1	2	3	4	5
8. Being fidgety or restless; difficulty sitting still.	1	2	3	4	5
9. Difficulty falling or staying asleep.	1	2	3	4	5
10. Experience of recurring thoughts or dreams.	1	2	3	4	5

III. Stress Evaluation

Evaluate your stress relative to the following:

	None	Slight	Moderate	Pronounced	Extensive
1. Family.	1	2	3	4	5
2. Significant Relationship.	1	2	3	4	5
3. Health.	1	2	3	4	5
4. Finances.	1	2	3	4	5
5. Sex Life.	1	2	3	4	5
6. Work.	1	2	3	4	5
7. School.	1	2	3	4	5
8. General well-being.	1	2	3	4	5
9. Emotional well-being.	1	2	3	4	5
10. Coping with daily problems.	1	2	3	4	5

IV. Life Enjoyment

Rate the following on a degree scale of 1-5:

	Not at all	Slight	Moderate	Considerable	Extensive
1. Openness to guidance to your "inner voice/feelings."	1	2	3	4	5
2. Experience of relaxation or ease or well-being.	1	2	3	4	5
3. Presence of positive feelings about yourself.	1	2	3	4	5
4. Interest in maintaining a healthy lifestyle (e.g., diet, fitness, etc).	1	2	3	4	5
5. Feeling of being open and aware/connected when relating to others.	1	2	3	4	5
6. Level of confidence in your ability to deal with adversity.	1	2	3	4	5
7. Level of compassion for, and acceptance of, others.	1	2	3	4	5
8. Satisfaction with the level of recreation in your life.	1	2	3	4	5
9. Incidence of feelings of joy or happiness.	1	2	3	4	5
10. Level of satisfaction with your sex life.	1	2	3	4	5
11. Time devoted to things you enjoy.	1	2	3	4	5

V. Overall Quality of Life

Evaluate your feelings relative to the quality of life:

	Terrible	Unhappy	Mostly Dissatisfied	Mixed	Mostly Satisfied	Pleased	Delighted
1. Your personal life.	1	2	3	4	5	6	7
2. Your wife/husband or "significant other".	1	2	3	4	5	6	7
3. Your romantic life.	1	2	3	4	5	6	7
4. Your job.	1	2	3	4	5	6	7
5. Your co-workers.	1	2	3	4	5	6	7
6. The actual work you do.	1	2	3	4	5	6	7
7. The handling of problems in your life.	1	2	3	4	5	6	7
8. What you are actually accomplishing in your life.	1	2	3	4	5	6	7
9. Your physical appearance - the way you look to others.	1	2	3	4	5	6	7
10. Your self.	1	2	3	4	5	6	7
11. Your ability to adjust to change in your life.	1	2	3	4	5	6	7
12. Your life as a whole.	1	2	3	4	5	6	7
13. Overall contentment with your life.	1	2	3	4	5	6	7
14. The extent to which your life has been as you want it.	1	2	3	4	5	6	7

VI. Overall Impressions

Answer each of the questions with respect to when you first came to this office:

	Better	Same	Worse
1. Overall my physical well-being is:	1	2	3
2. Overall my mental/emotional state is:	1	2	3
3. Overall my ability to handle stress is:	1	2	3
4. Overall my enjoyment of life is:	1	2	3
5. Overall my quality of life is:	1	2	3

CMBHS
Clinical Management for Behavioral Health Services

Substance Abuse Adult Assessment AST022

Assessment Information

Assessment Number

Assessment Date

Assessment Type

Contact Type

Assessment Site

Referred by

Comments

Client Issue

Presenting Problem

Expectations

Service Preferences or Objections to Treatment Interventions

Literacy or language barriers? ○ Yes ○ No

Comments

Other Current Service Providers

Provider Type	Provider Name	Phone	Ext

Comments

Staff Info

Interviewer

Primary Counselor

Comments

General Education Information

Is the client enrolled in School? ◯ Yes ◯ No

What type of School

What type of attendance has the client had in the last 90 days?

Current GPA?

What grades has the client completed?

Has the client received special education services?

How many months has the client completed in training or technical education?

Comments

Employment Information

What is the client's employment status?

What is the name of the clients current employer?

What is the reason the client is not in the labor force?

name of the client's current employer?

How many months has the client been employed by current employer?

How many months was the client employed during the last 12 months?

How many days was the client paid for working in the last 30 days?

What is the longest time the client has held a full-time job?

Usual or last occupation?

What is the client's usual employment pattern for the past 3 years?

Is the client a veteran? ◯ Yes ◯ No

Millitary discharge status?

Does the client have a valid driver's license? ◯ Yes ◯ No

Does the client have reliable transportation available? ◯ Yes ◯ No

What is the client's source of income/support?

How many people are dependent on client for the majority of their food, shelter, etc.?

Comments

Client Rating

How many days has the client experienced employment or school problems in the past 30 days?

How troubled or bothered has the client been by these employment or school problems in the past 30 days?

How important to the client now is treatment for these employment or school problems?

Comments

Interviewer Impressions

Is the above information significantly distorted by the client's misrepresentation? ◯ Yes ◯ No

Employment Status Severity

Is the above information significantly distorted by the client's difficulty understanding? ◯ Yes ◯ No

Comments

Living Situation

What is the client's current living situation?

What is the client's usual living arrangements (for past 3 years)?

How many years has the client lived at the current address?

Is the client a resident of the Colonias? ◯ Yes ◯ No

Is the client satisfied with these living arrangements? ◯ Yes ◯ No ◯ Indifferent

Comments

Family Profile

Are there people in your life that significantly influence the way you think, feel or behave?

Adult Profile (18 and above)

Relation	Name	Age	Gender	Race	Ethnicity	Caregiver	Employed	Household Member	Rate Quality Of Relationship	Problematic Substance Use	Mental Health Problem	Abuser	Legal Problems	Medical Problems

Youth Profile (Below 18)

Relation	Name	Age	Gender	Race	Ethnicity	Grade in School	Residence	Caregiver	Rate Quality Of Relationship	Problematic Substance Use	Mental Health Problem	Abuser	Legal Problems	Medical Problems

Comments

Support System

What is the client's marital status?

Is the client satisfied with these living arrangements? ◯ Yes ◯ No ◯ Indifferent

In what social, community and/or leisure activities does the client participate?

What are the client's and/or the client's family's religious and/or spiritual beliefs?

How often does the client practice or participate in the rituals of religion or spiritual beliefs?

With whom does the client spend most of their free time?

Is the client satisfied spending their free time this way? ◯ Yes ◯ No ◯ Indifferent

Comments

Children

Does the client need childcare services in order to participate in services? ◯ Yes ◯ No

Is the client formally seeking to regain custody of children? ◯ Yes ◯ No

Comments

Client Rating

How troubled or bothered has the client been in the past 30 days by the family problems?

How troubled or bothered the client been in the past 30 days by social problems?

How important to the client now is treatment or counseling for these family problems?

How important to the client now is treatment or counseling for these social problems?

Comments

Interviewer Impressions

Is the above information significantly distorted by the client's misrepresentation? ○ Yes ○ No

Is the above information significantly distorted by the client's difficulty understanding? ○ Yes ○ No

Family/Social Status Severity

Comments

General Legal Information

Was this assessment prompted or suggested by the criminal justice system? ○Yes ○No

What is the client's legal status?

Has client ever been arrested? ○Yes ○No

Has client ever engaged in illegal activities for profit? ○Yes ○No

Comments

Civil

Is the client involved in any civil action? ○Yes ○No

Comments

Client Rating

How serious does the client feel the present legal problems are?

How important to the client now is counseling or referral for these legal problems?

Comments

Interviewer Impressions

Is the above information significantly distorted by the client's misrepresentation? ○Yes ○No

Is the above information significantly distorted by the client's difficulty understanding? ○Yes ○No

Legal Status Severity

Comments

General Health

Does the client suffer from a chronic painful condition? ○Yes ○No

Sleep Pattern?

How many meals does the client eat each day?

Does the client have any difficulty eating? ○Yes ○No

Explanation

Does the client use emetics, diuretics or laxatives for the purpose of losing weight? ○Yes ○No

Has the client experienced a significant change in weight during the: Last 30 days? Last 3 months?

Describe the client's medical conditions ☐ None

Comments

Allergies and Adverse Drug Reactions

☐ None

Substance	Description of reaction

Comments

Current Medications

☐ None

Medication	Form	Type	Strength	Route	Frequency

Comments

Medical Treatment History

How many times in the past 12 months has the client been in a general hospital including the emergency room? ☐ Number of times

How many times in the client's life have they been in a general hospital including the emergency room? ☐ Number of times

Briefly describe the reason for each hospitalization and the length of stay

How many days in the past 30 days was the client in an environment supervised by a doctor, physician's assistant or nurse? ☐ Number of days

Type of Medically Controlled Environment?

Comments

Disability

Does the client receive financial support for a disability? ○Yes ○No

What is the disability?

How does the disability interfere with the activities of daily living (ACL)?

Comments

Risk Assessment for Communicable Diseases

Hepatitis-B/C and or Human Immunodeficiency Virus(HIV)

Has the client ever injected drugs?	○Yes ○No
Has the client ever shared injecting equipment?	○Yes ○No
Has the client ever shared equipment for snorting drugs?	○Yes ○No
Does the client have tattoos and/or piercings?	○Yes ○No
Has the client ever had unprotected sex (vaginal/oral/anal penetration) without condoms or latex barrier?	○Yes ○No
Has the client ever had unprotected sex with someone known to inject drugs?	○Yes ○No

Comments

Tuberculosis (TB)

Has the client had a persistent cough (longer than three months) for which they have not seen a physician?	○Yes ○No
Has the client been tested (screened for TB) within the past year?	○Yes ○No

Comments

Client Rating

How many days has the client experienced medical problems in the past 30 days?	☐
How troubled or bothered has the client been by medical problems in the past 30 days?	
How important to the client now is treatment or counseling for medical problems?	

Comments

Interviewer Impressions

Is the above information significantly misrepresentation?	○Yes ○No	Medical Status Severity
Is the above information significantly distorted by the client's difficulty understanding?	○Yes ○No	

Comments

Psychiatric Treatment History

How many times has the client has been treated for psychological problems in a hospital/residential environment? ☐

Has the client ever been treated for psychological problems in an outpatient setting? ○Yes ○No

Please provide the following information for each outpatient treatment:

1) Name/location of treatment facility?
2) Reason for treatment?
3) Diagnosis given?
4) Diagnosing professional?

Comments

Current and Historical Symptoms

Unrelated to substance use, has the client ever:

Symptom	Never	Last 30 Days	Last 6 Months	Last 12 Months	Lifetime
Experienced feelings of sadness that were unbearable	☐	☐	☐	☐	☐
Lost pleasure in all or almost all activities	☐	☐	☐	☐	☐
Felt worthless or have excessive or inappropriate guilt	☐	☐	☐	☐	☐
Been unable to make decisions, concentrate, or think	☐	☐	☐	☐	☐
Had difficulty managing anger	☐	☐	☐	☐	☐
Feel full of energy and ideas come rapidly	☐	☐	☐	☐	☐
Talked nearly non-stop	☐	☐	☐	☐	☐
Engaged in pleasurable activities with high potential for painful consequences	☐	☐	☐	☐	☐
Experienced preoccupation with sex	☐	☐	☐	☐	☐
Engaged in uncontrollable or compulsive behaviors	☐	☐	☐	☐	☐
Experienced excessive anxiety and worry	☐	☐	☐	☐	☐
Had difficulty managing day to day life	☐	☐	☐	☐	☐
Believed that almost anything is doable	☐	☐	☐	☐	☐
Heard voices that no one else hears	☐	☐	☐	☐	☐
Seen objects or things no one else sees	☐	☐	☐	☐	☐
Felt that people had something against the client without them necessarily saying so	☐	☐	☐	☐	☐
Believed that some group or individual may be trying to influence the client's thoughts or behaviors	☐	☐	☐	☐	☐
Experienced serious thoughts of harming behavior such as burning, cutting, or carving	☐	☐	☐	☐	☐

Experienced self harming behavior such as burning, cutting or carving	☐	☐	☐	☐	☐

Comments

Risk of Harm

Has the client ever:

Item	Response	Comment
Had recurrent thoughts of killing self		
Made plans for killing self		
Attempted to kill self		
Had recurrent thoughts of killing someone		
Made specific plans with intent to kill someone		
Attempted to kill someone		

Has the client ever had friends, family or significant others who have committed suicide? ○Yes ○No

Risk of Harm Comment

Current Affect

Clinical Observations

Abnormal Affect	○None	○Slight	○Moderate	○Considerable	○Extreme
Abnormal Appearance	○None	○Slight	○Moderate	○Considerable	○Extreme
Abnormal Behavior	○None	○Slight	○Moderate	○Considerable	○Extreme
Abnormal Speech/Language	○None	○Slight	○Moderate	○Considerable	○Extreme
Abnormal Thought Processes and/or Content	○None	○Slight	○Moderate	○Considerable	○Extreme
Anxiety	○None	○Slight	○Moderate	○Considerable	○Extreme
Delusional Symptomology	○None	○Slight	○Moderate	○Considerable	○Extreme
Depressed Mood	○None	○Slight	○Moderate	○Considerable	○Extreme
Difficulty With Alertness	○None	○Slight	○Moderate	○Considerable	○Extreme
Dissociative Symptomology	○None	○Slight	○Moderate	○Considerable	○Extreme

Elevated Mood	○None ○Slight ○Moderate ○Considerable ○Extreme
Hallucinations	○None ○Slight ○Moderate ○Considerable ○Extreme
Hostility	○None ○Slight ○Moderate ○Considerable ○Extreme
Hyperactivity/Distractibility	○None ○Slight ○Moderate ○Considerable ○Extreme
Impaired Insight	○None ○Slight ○Moderate ○Considerable ○Extreme
Impaired Judgment	○None ○Slight ○Moderate ○Considerable ○Extreme
Interpersonal Isolation	○None ○Slight ○Moderate ○Considerable ○Extreme
Impulsiveness	○None ○Slight ○Moderate ○Considerable ○Extreme
Intoxicated	○None ○Slight ○Moderate ○Considerable ○Extreme
Poor Eye Contact	○None ○Slight ○Moderate ○Considerable ○Extreme
Poor Grooming	○None ○Slight ○Moderate ○Considerable ○Extreme
Shame and/or Guilt	○None ○Slight ○Moderate ○Considerable ○Extreme
Uncooperativeness	○None ○Slight ○Moderate ○Considerable ○Extreme

Comments

Client Rating

How much has the client been troubled by these psychological or emotional problems in the past 30 days?

How important to the client now is treatment for these psychological or emotional problems?

Comments

Interviewer Impressions

Is the above information significantly distorted by the client's misrepresentation? ○Yes ○No

Is the above information significantly distorted by the client's difficulty understanding? ○Yes ○No

Mental Health Status Severity

Suicidality

Homicidality

Comments

Substance Use History

Has the client ever used alcohol and/or other drugs? ○Yes ○No

Primary Use

Substance Used

Route of Administration

Frequency of Use

Age at First Use

Last Date Used

How many years (any use at all)

Secondary Use

Substance Used

Route of Administration

Frequency of Use

Age at First Use

Last Date Used

How many years (any use at all)

Tertiary Use

Substance Used

Route of Administration

Frequency of Use

Age at First Use

Last Date Used

How many years (any use at all)

How much money did the client spend in the past 30 days on alcohol and/or other drugs?

Has the client had any physical consequences because of alcohol and/or other drug use? ○Yes ○No

Does the client frequently use more than one substance at a time? ○Yes ○No

In the past 30 days, how many days has the client been abstinent from all substances? Number of days

Comments

Current and Historical Symptoms

Due to their substance use, has the client ever experienced:

Symptom	Never	Last 30 Days	Last 6 Months	Last 12 Months	Lifetime
Shakes/Tremors	☐	☐	☐	☐	☐
Blackouts	☐	☐	☐	☐	☐
Memory lapses	☐	☐	☐	☐	☐
Cravings	☐	☐	☐	☐	☐
Vomiting	☐	☐	☐	☐	☐
Nausea	☐	☐	☐	☐	☐
Profuse sweating	☐	☐	☐	☐	☐
Hallucinations (Visual, Tactile, Auditory)	☐	☐	☐	☐	☐
Seizures	☐	☐	☐	☐	☐
DT's	☐	☐	☐	☐	☐
Anxiety	☐	☐	☐	☐	☐
Headaches	☐	☐	☐	☐	☐

Comments

Substance Treatment History

How many times has the client been treated for a substance use disorder? ☐ Number of times

How many of these were detox only? ☐ Number of times

How many days has the client been treated in an outpatient setting for alcohol and/or other drugs in the past 30 days? ☐

How many days has the client been treated in a residential or hospital setting for alcohol or drugs in the past 30 days? ☐ Number of days

How many months has it been since the last discharge from any substance treatment program? ☐

How many days has the client attended community-based mutual help groups for alcohol and/or other drugs in the past 30 days? ☐ Number of days

Does the client use tobacco on a daily basis? ○Yes ○No

Comments

Client Rating

How troubled or bothered has the client been in the past 30 days by Drug and/or Alcohol Problems?

How important to the client now is treatment for Drug and/or Alcohol Problems?

Comments

Interviewer Impressions

Is the above information significantly distorted by the client's misrepresentation? ○Yes ○No

Is the above information significantly distorted by the client's difficulty understanding? ○Yes ○No

Substance Status Severity

Comments

Strengths and Limitations

Client's Strengths	
Client's Limitations	
Comments	

AXIS I

#	Axis I Diagnosis	Justification

Comments	

AXIS II

#	Axis II Diagnosis	Justification

Comments	

AXIS III

#	Axis III Diagnosis	Justification

Comments

AXIS IV

Diagnosis

- ☐ Problems with primary support group
- ☐ Social environment
- ☐ Educational problems
- ☐ Occupational problems
- ☐ Housing problems
- ☐ Economic problems
- ☐ Problems with access to health care
- ☐ Problems in interaction with legal services
- ☐ None
- ☐ Other Psychosocial and Environmental Problems

Other Diagnosis

Comments

AXIS V

Diagnosis ☐ Numeric only

Comments

Summary and Recommendations

Stages of Change	
Priority Population Status	

Summary of Severity Scores

Employment Status Severity	
Family/Social Status Severity	
Legal Status Severity	
Medical Status Severity	
Substance Status Severity	
Mental Health Status Severity	
Substance Abuse Calculated Severity Score	
Substance Abuse Calculated Level of Care	
Client Refused to Receive Services	☐
Client Not Eligible for Treatment	☐
Substance Abuse Recommended Level Of Care	
Date of Substance Abuse Calculation	

Recommendation Comments

Comments	

Document Status	
Document Status Date	