

**Psychotropic Medication Adherence and Associated Issues in the Adult Forensic
Population: A Rapid Scoping Review**

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ABSTRACT

PSYCHOTROPIC MEDICATION ADHERENCE AND ASSOCIATED ISSUES IN THE ADULT FORENSIC POPULATION: A RAPID SCOPING REVIEW

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Objective: This rapid scoping review was designed to identify the prevalence, methods of measurement, contributing factors, and interventions related to psychotropic medication adherence with the adult forensic population in institutional and community settings. **Methods:** Articles were retrieved from PubMed, PsycINFO, Criminal Justice Abstracts with Full Text, and the Dissertation and Thesis Full Text data base. Literature was searched for studies written in English discussing psychotropic medication adherence for adult offenders in institutional or community settings. Title/abstract were reviewed to determine eligibility for inclusion and, if met, the full text article was reviewed. Data were extracted, charted, and analyzed for studies meeting inclusion criteria. **Results:** Eleven articles met inclusion criteria with varied results. Factors positively associated with adherence included provider empathy, guardian supervision and older age. Factors negatively associated with adherence included younger age and substance abuse. Results were mixed regarding race, gender, therapeutic alliance, and coercion. Structured adherence programs, substance use treatment, medication algorithms and therapeutic modalities like Cognitive Behavioral Therapy and Motivational Interviewing had positive impacts on medication adherence. **Conclusion:** Variance in adherence definitions and measurements did not allow for meaningful cross comparisons between studies. More research on medication adherence is needed, particularly with offenders with serious mental illness transitioning from jail to the community.

Keywords: forensic, psychotropic medication, adherence, compliance, offender, inmate, correctional facility, jail, prison, secure forensic hospital, serious mental illness

Dedication

To Rick, in loving memory.

“There are no goodbyes for us. Wherever you are, you will always be in my heart.”

— Mahatma Gandhi

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CHAPTER 1: BACKGROUND AND SIGNIFICANCE

Introduction

The importance of psychotropic medication adherence for individuals with serious mental illness is well researched in the literature. Poor medication adherence may lead to psychiatric decompensation and suboptimal treatment results, in addition to other undesirable health, social, and legal consequences. For individuals with serious mental illness—and for the forensic population in particular—psychotropic medication adherence has been posited to improve health outcomes, social functioning, and overall quality of life, as well as reduce rates of inpatient psychiatric hospitalization, incidents of violence, legal system involvement, and criminal justice recidivism (Thieda & Beard, 2003 as cited in Angell, 2006; White et al., 2006 as cited in Van Dorn et al., 2013; Constantine et al., 2010; Robertson et al., 2014; Lamberti et al., 2020).

The forensic population has complex treatment and psychosocial needs, in addition to other challenges. Those incarcerated in jails and prisons live in oppressive, violent, and inflexible environments that are often not conducive to therapeutic treatment (Jacobs & Giordano, 2018; Segal et al., 2018). Similarly, those on probation or parole may be subject to legal mandates that are antithetical to person-centered care. In addition, offenders with mental illness are often subject to coercive strategies, similar to their non-offending counterparts in the community but, perhaps with more serious and immediate consequences to their freedom. Leverage, threats, and compulsory mandates (including the use of involuntary medication) may be employed in an effort to address psychiatric instability, risk management concerns, and ensure public safety (Steadman et al., 2005 as cited by Szmukler & Applebaum, 2008; Skeem et al., 2006 as cited by Szmukler &

Applebaum, 2008; Trotter, 2018; Hachtel et al., 2019). These strategies, unfortunately, can adversely impact the offender's beliefs about treatment, relationships with treatment providers, and medication compliance. This, in turn, can result in the offender's diminishing medication compliance once those treatment pressures or mandates are removed leading to potential psychiatric decompensation and other adverse outcomes.

Literature on correctional social work from more than 40 years ago posits that offender treatment might be more effective if there were a more heightened awareness of coercive practices and an increased focus on person-centered approaches (Raynor, 1978). More recent literature on improving medication adherence strategies for individuals with serious mental illness further suggests that decreasing coercive practices reduces the risk of relapse and increases quality of life (Danzer & Rieger, 2016). Other related research determined that a lack of perceived choice and control contributes, in part, to poor treatment engagement with offenders (Sturges et al., 2016). Finally, more recent research with non-forensic individuals with serious mental illness affirmed that therapeutic alliance and therapist empathy have a positive impact on treatment engagement (Mallonee et al., 2022).

Despite the current political and public interest in treatment for offenders with serious mental illness, a preliminary review of the existing literature—including systematic and literature reviews—revealed a dearth of research on clinical practices with the forensic population in general (Howner et al., 2018) and on factors, for example, that influence medication taking behavior in a correctional setting (Shelton et al., 2010), often with contradictory findings (Cuthbertson et al., 2018). With increased desire to improve treatment strategies and interventions for criminal offenders with serious mental illness, it

is important to understand psychotropic medication adherence and its associated factors and to identify adherence strategies that are effective. Thus, in an effort to better understand the current treatment landscape of the adult criminal justice population, this rapid scoping review seeks to systematically map the research conducted on psychotropic medication adherence to identify the prevalence, methods of measurement, influencing factors, and interventions used with the adult forensic population in institutional and community settings so as to identify the types of available evidence, clarify key concepts, and identify gaps in knowledge.

Objectives

This rapid scoping review addressed the following questions—

1. What is the prevalence of psychotropic medication adherence among the adult forensic population in institutional and community settings?
2. How is medication adherence among this population measured?
3. What factors affect psychotropic medication adherence among this population?
4. What are the interventions and strategies used to enhance psychotropic medication adherence?

Rates of Incarceration in Jails, Prisons, and Forensic Hospitals

There are more than 10.35 million people incarcerated worldwide and, the United States, with more than 2.2 million of its citizens in jails and prisons, has the highest rate of incarceration in the world (Fazel & Seewald, 2012; Walmsley, 2015; Carson, 2020; Kaeble & Alper, 2020; Zeng & Minton, 2021). The numbers of individuals on probation and parole are similarly high. Recent reports from the U.S. Department of Justice (DOJ) show that there were more than 4 million adults on probation or parole in 2017-2018 (Kaeble & Alper, 2020). Furthermore, according to a 2017 report by the National Association of State Mental Health Program Directors (NASMHPD) on forensic patients in state hospitals in the United States, the total number of individuals in forensic state hospital beds—regardless of forensic status or category—was, on average, 24,540 on any given day in 2014 (Wik & Fisher, 2017, p. 76). In aggregate, these numbers are staggering and, over the past 30 years, as the census of the nation’s prisons and jails has grown, so have the number of individuals with serious mental illness in (and out) of these facilities. As a result, there is a well-founded belief that our correctional institutions have become *de facto* psychiatric hospitals (Felthous, 2015; Roth, 2018; Segal et al., 2018; Dvoskin et al., 2020).

Prevalence of Mental Illness in Prisons and Jails

The number of individuals in the criminal justice system who suffer from a mental illness has been well researched but with some degree of variance in data, due, in part, to discrepancies in definition, survey method, facility type, and locality. An initial study by the Department of Justice, Bureau of Justice Statistics (BJS) division (James & Glaze, 2006), for example, reported that the percentage of individuals in state prison,

federal prison, and jails who had experienced any mental health problem was 56%, 45%, and 64%, respectively.

Using slightly different measures, a subsequent BJS report released in 2017 found that as many as 37% of prisoners and 44% of jail inmates in the United States have, at one time, suffered from some form of serious psychological distress (Bronson & Berzofsky, 2017). This BJS study also found that approximately 14% of state and federal prisoners and approximately 25% of jail inmates met criteria for serious psychological distress in the 30 days prior to the survey as compared to 5% of the general population in the U.S. (Bronson & Berzofsky, 2017).

Additionally, the findings of a systematic review conducted on the lifetime prevalence of mental illness in a select group of American prisons confirmed what has already been suspected by various stakeholders in the public policy and mental health arenas—that the current and lifetime prevalence of mental illness is often substantially higher in correctional institutions than in the community (Prins, 2014). Similarly, two systematic reviews on severe mental illness in prisoners worldwide (Fazel & Danesh, 2002; Fazel & Seewald, 2012) confirmed higher rates of mental illness—especially psychosis, depression, and personality disorders—in prisoners than in the general population. Antisocial personality disorder, for example, is 10 times more likely to be diagnosed in prisoners than among private citizens (Fazel & Danesh, 2002). Despite the variance in the study data, there is a general consensus that the prevalence of mental health conditions of individuals in jails and prisons both in the United States and worldwide is strikingly higher in these institutions than in the general population.

Criminalization of Mental Illness

These data raise a question about the reasons for high numbers of individuals with serious mental illness in the criminal justice system, particularly as the population in the nation's jail and prison systems is increasing at alarming rates. And, given the high prevalence of mental health problems among the incarcerated, it may be tempting to theorize that there is a causal relationship between the presence of mental illness and an individual's potential for criminal behavior. However, the criminalization of mental illness is a multifaceted and complex social—as well as political—issue (Draine, 2003; Peterson et al., 2010; Raphael & Stoll, 2013; Dvoskin et al., 2020).

The “criminalization hypothesis,” or the theory that untreated mental health symptoms are a cause of criminal behavior—and, hence, criminal justice involvement—has been debated in the literature (Draine, 2003; Peterson et al., 2010). Draine (2003) suggests instead that, when exploring the reasons why people are arrested or recidivate, the more constructive exercise is to examine the psychosocial problems complicated—but not caused—by mental illness. Others posit that the criminalization of individuals with mental illness has been, in part, an unintended consequence of the deinstitutionalization of psychiatric hospitals in the United States that began in the 1950s which resulted in the release of formerly institutionalized individuals into the community with limited access to housing and treatment services (Harcourt, 2005; Raphael & Stoll, 2013; Sisti et al., 2015; Dvoskin et al., 2020).

However, the reasons for the increasing numbers of individuals with serious mental illness in the criminal justice system are far more nuanced and complex, and have deep roots in the history of the asylum as far back as ancient Greece when mental illness

was viewed as demonic possession rather than as a disease process (Felthous, 2015; Dvoskin et al., 2020). In fact, historians report that from the middle ages to the Renaissance and beyond, mental illness was often associated with evil spirits, moral depravity, and a proclivity for violence which are social prejudices that continues to exist to this day (Felthous, 2015; Dvoskin et al., 2020).

Deinstitutionalization and Mass Incarceration

Modern day criminalization of mental illness in this country has resulted, in part, from a combination of the “get tough on crime” era and the increasing public support of a punitive, rather than rehabilitative, model of correction that began in the 1980s and was the beginning of the era of mass incarceration (Cole, 2011; Lamb & Weinberger, 2017; Dvoskin et al., 2020). However, the foundation for the deinstitutionalization movement was laid much earlier starting in the 1950s with the introduction of psychoactive medication that allowed patients to be treated in an outpatient rather than hospital setting and the creation of federal programs in the 1960s—such as Supplemental Security Income, Social Security Disability Insurance, Medicaid, and Medicare—that paid for community-based treatment programs and supportive resources (Aderibigbe, 1997; Raphael & Stoll, 2013; Lamb & Weinberger, 2017). In addition, the influence of the civil rights era prompted a closer examination of patients’ rights that resulted in the implementation of due process protocols and limitations on civil commitment (Lamb & Weinberger, 2017). Finally, the high cost of institutionalization in combination with overcrowding in the state hospitals and the rising discomfort of the medical profession in treating the involuntary patient set the stage for a mass deinstitutionalization of state

hospitals across the United States (Mechanic & Rochefort, 1990 as cited by Raphael & Stoll, 2013; Lamb & Weinberger, 2017).

An unintended consequence of the deinstitutionalization movement that started in the 1950s and 1960s was the lack of funding for and availability of appropriate treatment and accessible housing services at the community level (Aderibigbe, 1997; Raphael & Stoll, 2013). Without access to adequate mental health treatment and housing, some of the individuals released from the state hospitals came to the attention of law enforcement and were subsequently arrested and incarcerated, often for petty crimes (Lamb & Weinberger, 2017). While experts posit that many of these individuals could have benefited from a structured, inpatient setting to stabilize their symptoms, the only means to provide this kind of housing and support was now available in jails and prisons (Lamb & Weinberger, 2017). Over the next several decades, it became clear that correctional institutions were the only facilities that had to accept these types of individuals and other offenders, regardless of mental health status and bed capacity limitations (Lamb & Weinberger, 2017).

Criminal Justice Diversion and Related Trends

In the latter part of the 20th century in the United States, as a result of constitutionally inadequate medical and mental health treatment and, later, chronic prison overcrowding, there was a rise in federal lawsuits on behalf of prisoners to improve the access to quality healthcare (Rold, 2008; Yanofski, 2010; Lamb & Weinberger, 2017). There was also a growing sentiment that the “tough on crime” agenda of the 1980s was actually less successful than anticipated and did not, in fact, reduce crime as intended (Cole, 2011; Lamb & Weinberger, 2017). Consequently, in part to address the

burgeoning jail and prison populations and ease the burden of overcrowding, state and federal governments passed legislation in an effort to decriminalize, reduce sentencing mandates, realign rehabilitation responsibility from the state to counties, and permit probationary terms in lieu of jail or prison time (Grattet et al., 2016; Lamb & Weinberger, 2017). Simultaneous to these policies, there was an increased effort in various jurisdictions to create specialty courts—such as mental health, drug treatment, and veteran courts—as another means to reduce unnecessary incarceration (Steadman et al., 2005; Moore & Hiday, 2006; Lamb & Weinberger, 2017). These diversion courts have, over the years, been more inclusive of offenders with mental illness, whose historical access to community-based treatment, housing resources, and other social services resources has been limited.

In the United States, the recent social and political agenda to address the incarceration of individuals with serious mental illness is evidenced by the growing interest to improve mental health treatment services for those who remain in jails and prisons, as well as those who are released to the community under court supervision (Prins & Draper, 2009; Osher et al., 2012; Trotter, 2018). Organizations such as the Council of State Government Justice Center (CSGJC) with its Stepping Up Initiative and the Substance Abuse and Mental Health Services Administration (SAMHSA) with its various training resources, advisory councils, and grant opportunities are examples of these efforts. This has been simultaneously fueled by class action litigation (e.g., *Coleman v. Newsom*, *OAC v. Mink*, *Young v. County of Contra Costa*, *Gray v. County of Riverside*, etc.), as well as legislative measures passed in state and federal localities across the country that support pre-trial and post-release mental health treatment for

offenders (e.g., Mentally Ill Offender Treatment and Crime Reduction Act of 2004; Assembly Bill 1810 in California, 2018). There have also been robust efforts to support and maintain the mental health wellness of probationers, parolees, and patients on conditional release from forensic state hospitals or regional equivalents (Osher et al., 2012; Lamb & Weinberger, 2017; Dvoskin et al., 2020).

Psychiatric Treatment in Forensic Hospitals and Other Correctional Settings

In the United States, jails are secure facilities in city or county localities where incarcerated individuals charged with crimes await adjudication of their case or, when convicted of low-level crimes, serve out a relatively brief sentence as punishment (Olley et al., 2009). Prisons serve a similar function, but are state or federal facilities that house individuals convicted of more serious crimes with frequently longer sentences (Olley et al., 2009). Often confused with each other, they are distinctly different in type of criminal offenses, population, social structure, and culture (Jacobs & Giordano, 2018). The population in jails, for example, is everchanging with individuals being arrested, booked, and released on a constant and daily basis (Kapoor et al., 2018; Segal et al., 2018). Additionally, the level of stress and associated personal crisis can be relatively high in jail settings, as the incarcerated adjust to their confinement and await the final disposition of their cases. This level of anxiety and uncertainty can often exacerbate pre-existing mental health conditions of the detained (Olley et al., 2009; Jacobs & Giordano, 2018). In comparison, the population in prisons tends to be more stable as the incarcerated have been convicted and are serving out their sentences, often for many years (Olley et al., 2009). Both types of facilities operate as paramilitary organizations with rules and structure further influenced by the often cynical and uber masculine culture of law

enforcement. (Jacobs & Giordano, 2018). These institutions were built with the primary intention to provide secure detention for criminal offenders, not to provide psychiatric treatment for the seriously mentally ill (Jacobs & Giordano, 2018; Segal et al., 2018).

In contrast, in the United States, forensic psychiatric hospitals are typically treatment oriented and utilized for competency restoration for jail detainees who are in criminal proceedings, secure placement for those found not guilty by reason of insanity, or for non-criminal reasons where secure psychiatric placement is warranted due to dangerousness, although they may serve a different function in other countries (Kapoor et al., 2018). These institutions do have the healthcare staff and structure to provide psychiatric care to a patient population with often complex mental health needs.

With respect to jails and prisons, landmark legal cases like *Estelle v. Gamble* in 1976 ensured constitutionally guaranteed health care rights for prisoners under the Eighth amendment (Rold, 2008) and, with the high rates of mental health conditions among the incarcerated, jails and prisons often inadvertently serve as treatment facilities for persons who are seriously mentally ill (Felthous, 2015; Roth, 2018; Segal et al., 2018; Dvoskin et al., 2020). However, unlike hospital systems that are designed to provide medical and mental health treatment, jails and prisons may contend with competing institutional goals (e.g., safety and security vs. therapeutic treatment), harsh environmental conditions, physical plant limitations, inadequate staffing, and poor interdisciplinary collaboration that contribute to a substandard delivery of services (Jacobs & Giordano, 2018; Kapoor et al., 2018; Segal et al., 2018). In addition, the correctional environment, with its oppressive regime and often violent living conditions, is not conducive to therapeutic treatment and recovery (Sisti et al., 2015; Jacobs & Giordano, 2018; Segal et al., 2018).

In these institutions, much like in the community, psychotropic drugs are an important component in the treatment and management of psychiatric symptoms and disorders (Griffiths et al., 2012; Jacobs & Giordano, 2018). As many jails and prison do not offer an array of complementary therapeutic services, medication management may be the only treatment that is readily available (Jacobs & Giordano, 2018). However, dispensing medication is not without its challenges in correctional settings, and obstacles with consistent medication delivery include rigid institutional policies, unpredictability of the milieu, inadequate staffing, time constraints, and patient volume (Segal et al., 2018). Other barriers to optimal psychotropic treatment in correctional healthcare include patient non-compliance (sometimes resulting in involuntary treatment), medication side effects, polypharmacy, disparate formularies, and poor continuity of care upon release from custody (Griffiths et al., 2012; Jacobs & Giordano, 2018; Segal et al., 2018).

Emerging Treatment Interventions and Programs for Offenders

For individuals with mental illness in the criminal justice system, whether in the community or institutional care, there are real and perceived public safety concerns associated with this population which has resulted in a trend toward more coercive strategies to ensure treatment and medication compliance. The rise in popularity and practice of interventions that mandate or “assist” treatment, such as Assisted Outpatient Treatment (AOT), Forensic Assertive Community Treatment (FACT) teams (Marquant et al., 2016), or state sanctioned competency restoration practices that involve the administration of involuntary medication of the criminal defendant with serious mental illness, are more commonplace in many localities across the country (Heilbrun & Kramer, 2005; Felthous, 2015; Xiong, 2019).

The recent adoption of Penal Code 2603 in California, the law that allows the involuntary medication of pre-trial detainees with serious mental illness who are determined to be a danger to self or others and/or are gravely disabled, is another such example. This was preceded by Penal Code 2602, a law in California that permits the involuntary medication of convicted prisoners in the California Department of Correction and Rehabilitation who are deemed to be a danger to themselves or others and/or believed to be gravely disabled due to serious mental illness.

While well-intended, some of the unintended consequences of these strategies include the potentially negative impact on the offenders' beliefs about treatment, their sense of autonomy and decision-making power, and their relationships with treatment providers. They are also at risk of disengagement from treatment and decreased medication compliance in the absence of treatment pressures (Dyer & Bloch, 1987; Lowry, 1998 as cited in O'Brien & Golding, 2003; O'Brien & Golding, 2003; Osterberg & Blaschke, 2005; Danzer & Rieger, 2016).

The Challenge of Medication Adherence

The challenge inherent in the endeavor to improve mental health care and treatment for offenders with mental illness is that adherence to a regimen of medication for individuals with chronic conditions—inclusive of mental illness—is long known to be problematic. The World Health Organization's 2003 report, *Adherence to Long-term Therapies: Evidence for Action*, for example, contends that medication adherence for treatment of chronic disease is “a worldwide problem of striking magnitude” and reports a medication adherence rate of approximately 50% in developed countries and even lower rates in developing nations (Sabate, 2003, p. 7). Additionally, with respect to

adherence to psychotropic medication, at least half of patients with chronic psychiatric conditions do not take their medications as prescribed, forget to take them, or stop taking them altogether (Chakrabarti, 2014). Finally, the ability for practitioners to accurately recognize treatment non-compliance or non-adherence of their patients is limited, absent obvious psychiatric decompensation, and effective strategies and interventions that may enhance medication-taking behavior, but are often complex and expensive (Osterberg & Blaschke, 2005; Chakrabarti, 2014).

Defining Medication-Taking Behavior

Although medication adherence has been the focus of research across disciplines, there has been little agreement in both literature and practice on definition, measurement, and assessment of medication-taking behavior (Osterberg & Blaschke, 2005; Julius et al., 2009; Kane et al., 2013; Chakrabarti, 2014; Farooq & Naeem, 2014). The terms most often associated with medication usage and medication-taking behavior are *compliance* and *adherence* (Julius et al., 2009; Chakrabarti, 2014). More recently, *concordance* has been suggested as an alternative (Chakrabarti, 2014). While these terms overlap and are used interchangeably at times, each has a slightly different meaning from the other.

Until recently, *compliance* had been the traditional term used to describe an individual's medication-taking behavior and participation in treatment. It had been considered a term that was neutral and non-accusatory considering that previous words used to describe patients who did not follow treatment recommendations often included *untrustworthy* and *uncooperative*; *compliant* or its negative form, *non-compliant*, were seen as better alternatives (Chakrabarti, 2014). Today, the use of *compliance* is less popular as it has paternalistic and negative connotations (Julius et al., 2009). Although

the use of the word *compliant* is still common in clinical practice (and correctional settings), its use is not consistent with research in recent years that has affirmed the importance of considering the patient's perspective, circumstances, and needs when determining a medication regimen (Chakrabarti, 2014).

Currently, the preferred nomenclature to describe medication-taking behavior and participation in treatment is *adherence* (Julius et al., 2009; Brown et al., 2016).

Adherence is defined as the extent to which a patient's behavior is consistent with a medical provider's recommendations for medication and treatment (Julius et al., 2009; Brown et al., 2016). Whereas *compliance* is more of a dichotomous conceptualization of medication-taking behavior, *adherence* more accurately describes a continuum of behaviors that ranges from complete refusal to partial or consistent ingestion of medication (Julius et al., 2009; Chakrabarti, 2014). While not necessarily embraced by all, *adherence* has emerged as a term that is used to convey increased respect for patient autonomy and a more collaborative relationship between practitioner and patient (Chakrabarti, 2014).

Finally, *concordance* is another term that has emerged, but is less utilized in practice, that seeks to describe medication-taking behavior. It was proposed to emphasize both the therapeutic alliance and the equality of both patient and provider in influencing medication and treatment decisions (Chakrabarti, 2014). This approach emphasizes consensus building and purports to consider and respect the patient's views regarding medication use, even when it conflicts with the provider's own recommendations (Chakrabarti, 2014).

While none of these terms truly captures the complex process of medication-taking behavior, the progression from *compliance* to *adherence* and *concordance* suggests an evolution in concept and practice that places the patient's perspective and needs at the center of the treatment discussion (Chakrabarti, 2014). This is an important concept to both consider and embrace because a patient's perceptions and therapeutic alliance with the provider can influence medication-taking behavior (Chakrabarti, 2014; Farooq & Naeem, 2014; Brown et al., 2016).

Measuring Medication Adherence

The ability to accurately measure medication-taking behavior and adherence to a recommended treatment regimen is essential in ensuring positive outcomes for individuals with serious mental illness (Sabate, 2003; Angell, 2006). Accurate assessment of adherence behavior is also important for ongoing treatment planning, medication changes, and communication around treatment engagement (Sabate, 2003). However, there is an absence of measurement techniques that can reliably assess or measure medication adherence (Sabate, 2003; Farooq & Naeem, 2014). In addition, while 100% adherence to medication may be desirable, research suggests it is rarely achieved in practice (Sabate, 2003; Osterberg & Blaschke, 2005; Farooq & Naeem, 2014). That being said, there is also little agreement on an optimal level of adherence although an often-referenced standard in drug adherence research is 80% (Osterberg & Blaschke, 2005; Julius et al., 2009; Farooq & Naeem, 2014).

The literature on psychotropic medication non-adherence indicates that it is a complex and multifaceted issue (Sabate, 2003; Angell, 2006; Chakrabarti, 2014; Farooq & Naeem, 2014; Brown et al., 2016). As such, non-adherence may take many forms. It

can be sporadic or continuous, intentional or inadvertent, specific or pervasive, obvious or hidden (Farooq & Naeem, 2014; Brown et al., 2016). Non-adherence may even be medication- or regimen-specific (Farooq & Naeem, 2014).

The literature also suggests that measuring medication adherence is as challenging as defining terms for medication-taking behavior and, while there are many different approaches to measuring adherence, there is no identified “gold standard” (Osterberg & Blaschke, 2005; Hess et al., 2006; Brown et al., 2016). Even more problematic is the absence of tools that can reliably assess or measure medication adherence in clinic settings (Farooq & Naeem, 2014). Outside of institutional care, one of the obstacles in measuring adherence is reliance on patient self-report which is often subject to inaccuracy and difficult to verify (Farooq & Naeem, 2014). There are other more expensive and invasive measurement strategies, such as electronic monitoring equipment and medical testing, but these options may still be vulnerable to patient tampering, burdensome for the provider to implement, hinder patients from taking a more active role in their treatment, and be less available in disadvantaged communities (Osterberg & Blaschke, 2005; Julius et al., 2009; Farooq & Naeem, 2014).

Although classifying non-adherence monitoring strategies is difficult, the literature suggests there are generally two broad categories of methods—direct and indirect (Hess et al., 2006; Farooq & Naeem, 2014). Direct strategies include observing patients when they take their medication and measuring drug assays or markers via urine or blood analysis (Hess et al., 2006; Farooq & Naeem, 2014; Brown et al., 2016). Indirect strategies include patient self-report through questionnaire or interview, pill counts, review of pharmacy refill records, and electronic monitoring systems (Hess et al., 2006;

Farooq & Naeem, 2014; Brown et al., 2016). None of these methods is infallible and even direct observation of medication-taking behavior has its limitations (Osterberg & Blaschke, 2005; Farooq & Naeem, 2014).

Factors Associated with Medication Non-Adherence

The factors associated with medication non-adherence are varied and have been researched by categories such as health condition, setting, personal characteristics, and medication (Bulloch & Patten, 2009; Brown et al., 2016; Velligan et al., 2017; Cuthbertson et al., 2018; Semahegn et al., 2020). Brown et al. (2016) classified medication non-adherence factors into three general categories—patient, provider, and system. Julius et al. (2009) posited that factors affecting medication adherence fell into four categories that included patient-related, psychological, medication-related, and social/environmental. Sabate (2003) in the WHO report on medication adherence identified five dimensions that included social and economic, health system, therapy, condition, and patient factors. With respect to medication non-adherence in forensic populations, setting is another important factor to consider (Cuthbertson et al., 2018). Similar to Sabate (2003), other researchers found that patient-related factors (including lack of insight and negative attitude toward medication), co-morbidities with other conditions (such as a substance use disorder), lack of social support, illness-related factors, and health system issues affected medication adherence, specifically psychotropic medication (Velligan et al., 2017; Semahegn et al., 2020).

Some key factors that impact medication-taking behaviors include the patient's beliefs and attitudes about medication and treatment; the beliefs and attitudes of the patient's loved ones and support system; cost of treatment; patient's understanding and

knowledge of the illness (i.e. patient's health literacy and insight); medication side effects; medication administration; the practitioner-patient relationship and therapeutic alliance; forgetfulness; provider's failure to communicate important information; poor coordination of care; polypharmacy; patient demographics; substance use; poor treatment engagement; setting (i.e., home, hospital, correctional institution, etc.) and others (Julius et al., 2009; Chakrabarti, 20014; Brown et al., 2016; Cuthbertson et al., 2018).

Consequences of Medication Non-Adherence

The literature on medication adherence suggests that poor adherence to medication leads to unwanted health outcomes and a poor prognosis for recovery (Sabate, 2003; Khalifeh & Hamdan-Mansour, 2021). Additionally, for those individuals with serious mental illness who do not adhere to their medication regimens as prescribed, this circumstance may lead to emergence or exacerbation of psychiatric symptoms and acute decompensation requiring emergency care (Thieda & Beard, 2003 as cited in Angell, 2006; White et al., 2006 as cited in Van Dorn et al., 2013). In some cases, non-adherence may further result in involuntary psychiatric hospitalization, unwanted contact with law enforcement and the criminal justice system, and criminal recidivism (Draine & Solomon, 2001 as cited in Draine, 2003; Constantine et al., 2010; Martinez, 2010; Blevins et al., 2014; Robertson et al., 2015; Lamberti et al., 2020). In addition, poor medication and treatment adherence for individuals with serious mental illness may exacerbate other psychosocial issues like substance use, homelessness, and continued societal disenfranchisement (Constantine et al., 2010). Finally, the overall economic impact of medication non-adherence is staggering and, in recent years, has cost the United States over \$100 billion in healthcare costs alone (Julius et al., 2009).

Strategies to Improve Medication Adherence

Strategies to improve medication adherence generally fall into two categories—psychosocial and pharmacologic (Farooq & Naeem, 2014). Psychosocial interventions are typically driven by psychoeducation and theoretical constructs such as cognitive behavioral therapy and motivational interviewing. They are provided through individual, family, and group therapy in community, institutional, and hospital settings (Julius et al., 2010; Farooq & Naeem, 2014; Xia et al., 2020). Farooq and Naeem (2014) also acknowledged the use of legal interventions, such as community treatment orders, that mandate compliance for certain patient populations. In addition, forensic populations in both institutional and community settings may be subject to invasive monitoring, intensive case management, threats of involuntary medication orders, hospitalization, or incarceration (Swanson et al., 1997 as cited in Angell, 2006; Draine & Solomon, 2001 as cited in Draine, 2003 and Angell, 2006; Macinnes & Masino, 2018).

Pharmacologic interventions often require a positive therapeutic alliance between patient and provider and a careful selection of medication that considers type of administration, side effects, and simplicity of regimen (Julius et al., 2010; Farooq & Naeem, 2014; Xia et al., 2020). The use of long-acting injectable medication is frequently preferred to improve treatment adherence, especially in court-ordered treatment, although there are conflicting results in randomized controlled studies on its efficacy (Velligan & Weiden, 2009 as cited in Farooq & Naeem, 2014; Rosenbeck et al., 2011 as cited in Farooq & Naeem, 2014; Tiihonen et al., 2011 as cited in Farooq & Naeem, 2014; Kishimoto et al., 2014 as cited in Farooq & Naeem, 2014; Cusimano & VandenBerg, 2020).

Given the multi-dimensional factors that contribute to poor medication adherence, multi-level strategies, rather than a single factor approach, are recommended for optimal results (Sabate, 2003). This may involve instituting system-level policy change in healthcare organizations, increasing educational strategies to raise awareness of adherence, assessing medication regimens to improve outcomes, treating co-morbidities that affect adherence (e.g., substance use), and developing motivational and self-management strategies to address patient-level factors (Sabate, 2003).

Psychotropic Medication Adherence in Community Settings

There have been several systematic, scoping, and literature reviews on psychotropic medication adherence with community-based populations (Kane et al., 2013; Velligan et al, 2017; Semahegn et al., 2020; Khalifeh & Hamdan-Mansour, 2021). These reviews examine the rates of prevalence and different domains of psychotropic medication non-adherence with psychiatric patients in community settings and offer a helpful point of comparison with forensic populations. The authors of these reviews vary in discipline (public health, psychiatry, and nursing) and nationality (United States, Japan, Ghana, and Ethiopia), but there is consistent agreement that medication non-adherence is a known issue in medicine, regardless of disease process, and general agreement that it is important to understand and address the factors that impact non-adherence in order to identify appropriate interventions. All studies focused on non-adherence by psychotropic medication type and/or psychiatric disorder. The authors of these studies also researched one or more of the following domains of psychotropic medication adherence: epidemiology, defining adherence, measuring adherence,

identifying factors contributing to non-adherence, and discussing management strategies to improve adherence.

The publication by Kane et al. (2013) is a literature review that discusses the epidemiology, contributing factors, and management strategies of medication non-adherence in individuals with psychotic disorders, mostly schizophrenia, from various countries around the world. The review references 18 RCT, naturalistic, and mixed methods studies of various populations (ranging widely from 151 to 63,214 patients per study), but has no clearly articulated methodology. The authors discuss research during an undefined time period that ranged from the late 1990s through early 2000s which focused on epidemiology, contributing factors, and adherence management strategies.

In contrast, the scoping review by Khalifeh and Hamdan-Mansour (2021) and systematic reviews by Velligan et al. (2017) and Semahegn et al. (2021) on psychotropic medication adherence in the general population had clearly defined methodologies and well-articulated protocols. Only Semahegn et al. (2021) included a meta-analysis. These reviews focused on various patient populations—the scoping review by Khalifeh and Hamdan-Mansour (2021) discussed individuals diagnosed with depression only, while the systematic reviews by Velligan et al. (2017) and Semahegn et al. (2021) examined medication non-adherence among patients with schizophrenia, depression, and bipolar disorder.

In addition, there was some variance in the number, timeframe, and type of studies included in each review. The scoping review by Khalifeh and Hamdan-Mansour (2017) included 37 English language studies published between 2014 and 2019. Velligan et al. (2017) found 36 studies published between January 1, 2005 and September 10,

2015 that met inclusion criteria for their study. These included cross-sectional, surveys, prospective observational or clinical trials, and post hoc analyses of data from prospective studies or clinical trials in Europe, the United States, Canada, Asia, Africa, Australia, and Israel (Velligan et al., 2017). The systematic review by Semahegn et al. (2021) examined 46 studies, published and unpublished, with observational study designs written in English before December 31, 2017.

The findings from these reviews were not unexpected. With respect to prevalence, Kane et al. (2013) reported non-adherence rates ranging from 2.3% to 58.4% and found that non-adherence data varied depending on the population, stage of illness, definition of adherence, and method of measurement. Khalifeh and Hamdan-Mansour (2021) reported rates of medication adherence that ranged from 10.6% to 85.4% for individuals with some type of depressive disorder. Velligan et al. (2017) reported ranges of non-adherence in the studies that were difficult to compare with each other due to variance in definition, measurement strategy, and patient population, but ranged from 11% (non-adherent) to 71% (partially non-adherent). Semahegn et al. (2020), in their study of psychotropic non-adherence among patients with psychiatric disorders, found an overall rate of non-adherence to be 49%, with rates of non-adherence for schizophrenia, major depressive disorders, and bipolar disorders to be 56%, 50%, and 44%, respectively.

Other findings were varied with some points of similarity. In the literature review on medication non-adherence in patients with psychotic disorders, Kane et al. (2013) reported that studies using objective measures of measurement (such as pill count and blood level readings) found lower levels of adherence. The authors also found that identifying the factors that influence adherence and using cutting edge technology can

assist in early intervention and implementation of potentially effective medication management strategies. Additionally, the systematic review findings by Velligan et al. (2017) on reasons for medication non-adherence with patients with serious mental illness such as schizophrenia, depression, and bipolar disorder suggested that a negative attitude and active substance use affected non-adherence in this population and that utilizing adherence strategies to address these specific issues may improve outcomes. The systematic review by Semehegn et al. (2020) on psychotropic medication non-adherence and the associated factors among patients with major psychiatric disorders also found that the rate of medication non-adherence was high, that non-adherence was impacted by different factors, and that strategies to address non-adherence should be multifaceted. Finally, the scoping review by Khalifeh and Hamdan-Mansour (2021) that focused primarily on the prevalence, barriers, and interventions related to medication adherence among patients with depression made similar conclusions to Semehegn et al. (2020) in that different factors (e.g., illness-, medication-, and patient-related) influence adherence and that a comprehensive, rather than single-intervention, approach is more effective.

Psychotropic Medication Adherence in Forensic Settings

Research on psychotropic medication adherence in the forensic population was sparse, resulting in the discovery of very few synthesized knowledge reviews. Three key reviews surfaced—a literature review on psychotropic medication adherence in correctional facilities (Shelton et al., 2010), a systematic review of psychotropic drug prescribing for prisoners (Griffiths et al., 2012), and a systematic review on forensic psychiatric care that identified knowledge gaps for future research (Howner et al., 2018). The authors reflected a diversity of disciplines and nationality that included nursing

(United States), pharmacy (Australia), and psychiatry (Sweden). However, two of the three reviews yielded so few studies within their area(s) of focus that, with such limited data, the authors could not report any meaningful results (Shelton et al., 2010; Howner et al., 2018).

Shelton et al. (2010) conducted an oft-referenced literature review on psychotropic medication adherence in correctional facilities on research studies written between 1973 and 2009. All designs and methodologies were included, but publication status was not specified. Only nine studies met inclusion criteria. Shelton et al. (2010) found that while psychotropic medications are known to be an effective treatment for individuals with serious mental illness, there is little data on psychotropic medication adherence on adult offenders in correctional facilities. Shelton et al. (2010) also found that information is lacking on behavioral change, symptom management, and patterns of compliance during incarceration that could be helpful in assisting the offender's successful re-entry into the community. The authors identify five factors that improve medication adherence: individual traits or characteristics; prior treatment with medication; level of insight, environment; and the presence of side effects.

Griffiths et al. (2012) examined psychotropic medication prescribing practices with prisoners. The review included qualitative and quantitative studies written in English that were published between January 1999 and October 2009. Thirty-two studies met inclusion criteria. Although this systematic review focused on only one aspect of treatment of prisoners with mental health issues—psychotropic prescribing practices—the researchers felt it was important to examine how these medications were being prescribed and what areas of improvement, if any, existed. Griffiths et al. (2012) found

that polypharmacy was prevalent, that the use of psychotropic medication (particularly antipsychotics) at high doses was common, that there was a concern for continuity of care (pre- and post-incarceration), that consistent monitoring and documentation practices were essential to identify potential side effects as well as adverse drug reactions so as to maintain treatment adherence and patient trust, and that some practitioners were subject to interpersonal pressure by prisoners, influencing prescribing. Additionally, Griffiths et al. (2012) found that none of the studies made recommendations about a continuity of care approach or model that would sustain treatment into the community.

Finally, Howner et al. (2018) embarked on a more comprehensive exploration of forensic psychiatry by examining systematic reviews within this field. Systematic reviews focusing on quantitative studies written in English, Swedish, Norwegian, or Danish were included in this study. Timeframe and publication status were not specified. The authors explored five domains within forensic psychiatric care: 1) diagnostic and risk assessments, 2) psychotropic medication, 3) clinical or psychological interventions, 4) psychosocial interventions, and 5) restraint interventions. The authors found 38 systematic reviews meeting inclusion criteria, but determined that most of the primary studies had a high risk of bias. Consequently, they concluded that they could not adequately address their research questions and, as such, the study's identified five domains were deemed to be knowledge gaps in need of further study.

Conclusion

While there is an abundance of research studies that explore reasons for non-adherence to psychotropic medication in psychiatric populations in the community and adherence management strategies for populations with specific mental health conditions,

there appears to be few research studies that evaluate psychotropic medication prevalence or adherence strategies with the forensic population in either institutional or community settings (Shelton et al., 2010; Griffiths et al., 2012; Howner et al., 2018). This rapid scoping review will systematically map the research to identify the prevalence, methods of measurement, influencing factors, and interventions used with the adult forensic population in institutional and community settings with respect to psychotropic medication. Identifying available evidence, clarifying key concepts, and identifying gaps in knowledge on this topic is key in understanding the needs of this special population and planning for future research.

CHAPTER 2: RESEARCH DESIGN AND METHODS

Purpose

The purpose of this rapid scoping review is to identify the prevalence, methods of measurement, influencing factors, and interventions related to psychotropic medication adherence with the adult forensic population in institutional and community settings.

Rapid Scoping Review Methodology

As scoping and systematic reviews can often take 6 months to 2 years to complete, this research project is utilizing a rapid scoping review approach in order to meet academic deadlines (Khangura et al., 2012; Tricco et al., 2015). Scoping reviews are a methodology within the family of knowledge synthesis that uses a systematic approach to review existing literature in a given field for one or more of the following reasons—to identify available evidence on a topic of study; to identify and map key concepts in the research literature; to determine whether to conduct a systematic review; to identify and examine knowledge gaps; and to summarize and disseminate existing research (Arksey & O'Malley, 2005; Levac et al., 2010; Khalil et al., 2016; Tricco et al., 2016; Munn et al., 2018; Tricco et al., 2018, Aromataris & Munn, 2020; Peters et al., 2020; Khalil et al., 2021).

Also in the family of knowledge synthesis is another type of review—a rapid review—that is used to streamline the methodological approach without sacrificing the integrity of the research process (Khangura et al., 2012; Tricco et al., 2015). The working definition used by Khangura et al. (2012) is ‘a type of knowledge synthesis in which components of the systematic review process are simplified or omitted to produce information in a short period of time.’ A more recent description of the rapid review

describes it as “a useful approach to swiftly provide actionable and relevant evidence to make informed decisions...” using a “...transparent, scientific, and reproducible method that respects the key principles of knowledge synthesis.” (Tricco et al., 2017, p. 2).

Fortunately, there have been some advances in the last few years for methodological and reporting guidance of scoping reviews (Tricco et al., 2018). Given the need for a standard scoping review protocol, several scoping review subject matter experts developed a rigorous and defined methodology using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) systematic review guidelines and modifying them to the scoping review methodology (Tricco et al., 2018). Specifically for this review, the Joanna Briggs Institute (JBI) Manual for Evidence Synthesis scoping review protocol was used for guidance and modified to accommodate the rapid review approach. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) was also employed for reporting guidance.

Methods

Protocol and Registration

The Joanna Briggs Institute (JBI) Manual for Evidence Synthesis scoping review protocol was used for methodological guidance. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) was employed for reporting guidance. The study protocol was not registered.

Inclusion Criteria

Per scoping review protocol, the elements of population, concept, and context (PCC) were used to guide the inclusion criteria (Munn et al., 2018).

Following the period of mass deinstitutionalization in the United States and its aftermath, the 1990s appears to be the start of greater research interest in the psychotropic medication management and treatment of offenders with mental illness. As such, this review included qualitative, quantitative, and mixed methods studies written in English from January 1990 to December 2021 on adult offenders ages 18 years and older in institutional or community placement who had been diagnosed with a primary psychiatric condition and prescribed psychotropic medication. For inclusion, the authors of the study needed to discuss factors associated with non-adherence and/or specific medication adherence strategies or interventions used with this population of offenders.

For the purposes of this review, adult offenders included those individuals in jail, prison, a forensic state hospital, or similar secure forensic facility, as well as those individuals on probation, parole, or conditional release from a forensic state hospital (or other secure forensic facility) who remain under court supervision. Additionally, adult offenders with mental illness included those individuals described above who had been diagnosed with a primary psychiatric condition and had been prescribed psychotropic medication. Major psychiatric disorders in the following categories—bipolar and related disorders, depressive disorders, and schizophrenia spectrum and other psychotic disorders—were included in this review. Individuals with an intellectual disability, neurocognitive disorder, and/or a primary substance use disorder were excluded. Individuals with a substance use disorder were included only if they had a comorbidity with one of the included psychiatric diagnoses for which they had been prescribed medication. Although individuals with personality disorders—particularly antisocial personality disorder—are represented in higher numbers in the prison population than in

the general public (Fazel & Danesh, 2002), those with a diagnosed personality disorder were included as long as they did not exceed 25% of the total study population.

Exclusion criteria included studies that focused on juvenile offenders and those that did not explicitly discuss psychotropic medication adherence. Additionally, those studies in which the offender had an intellectual disability, neurocognitive disorder, and/or a primary substance use disorder were excluded. Finally, studies written in a language other than English were excluded.

Information Sources

Published studies were retrieved from PubMed, PsycINFO, and Criminal Justice Abstracts with Full Text. The Dissertation and Thesis Full Text database was also searched for unpublished studies. Although the original intent of this researcher was to examine the reference list of the included studies of the literature search results, this was not done due to time constraints. Instead, this researcher used Scopus to identify studies on psychotropic adherence with offenders that cited the studies included in the literature search. The decision to make this change was made in consultation with a research librarian from the University of Pennsylvania's Biotech Commons Library.

Search Strategy

The search strategy was developed with the guidance of the University of Pennsylvania's Biotech Commons Librarians. The databases utilized were PubMed, PsycINFO, Criminal Abstracts with Full Text, and the Dissertation and Theses which, based on librarian guidance, are considered to provide a broad range of research studies on a specific topic within the parameters of a rapid scoping review. The search was conducted using three key concepts of forensic, psychotropic medication, and adherence.

Both official vocabulary and keywords were used, for example, MeSH Terms in PubMed along with potential keywords from the title or abstract of citations. Following are MeSH terms and keywords for each concept. These terms were adapted for the other databases used:

Concept 1: Forensic

Keywords: offender*[tw] OR incarcerat* [tw] OR criminal* [tw] OR defendant*[tw] OR jail [tw] OR “secure facility” [tw] OR penal [tw] OR penitentiary[tw] OR probation* [tw] OR parole* [tw] OR felon* [tw] OR misdemean* [tw] OR inmate* [tw] OR remand [tw] OR convict* [tw] OR “conditional release” [tw] OR “forensic assertive community treatment” [tw] OR “jail diversion” [tw] OR “competency restoration” [tw] OR “pretrial” [tw] OR “detainee” [tw] OR “justice-involved” [tw] OR “pretrial diversion” [tw] OR “diversion” [tw]
MeSH: “Forensic Psychiatry”[Mesh] OR “Forensic Psychology”[Mesh] OR “Forensic Nursing”[Mesh] OR “Correctional Facilities”[Mesh] OR “Criminal Law”[Mesh] OR “Criminals”[Mesh] OR “Criminal Psychology”[Mesh] OR “Criminal Behavior”[Mesh] OR "Hospitals, State"[Mesh] OR "Prisons"[Mesh] OR "Prisoners"[Mesh]

Concept 2: Psychotropic medication

Keywords: psychoactive [tw] OR antipsychotic [tw] OR pharmacological [tw] OR “long acting injecti*” [tw] OR “mood stabilizer” [tw] OR “antidepressant” [tw] OR “neuroleptic” [tw]
MeSH: "Psychotropic Drugs"[Mesh] OR "Psychotropic Drugs" [Pharmacological Action] OR "Psychopharmacology"[Mesh]

Concept 3: Adherence

Keywords: “involuntary medication” [tw] OR “forced medication” [tw] OR “mandated treatment” [tw]
MeSH: "Treatment Adherence and Compliance"[Mesh] OR "Medication Adherence"[Mesh] OR "Patient Compliance"[Mesh]

The search strategies for PubMed, PsycINFO, Criminal Abstracts with Full Text, and the Dissertation and Theses database can be found in Appendix A.

Screening Process

Covidence is a web-based software platform that streamlines the systematic review process making it more efficient to screen references (both title/abstract and full text) for reviewing teams of two or more people. The first level of screening included independent review of the article title and abstract by the primary researcher and secondary reviewer. Those studies that passed initial screening moved on to the second level of review which involved full text article review. Questions about study inclusion were resolved through discussion and consensus between the researcher and the secondary reviewer. The primary researcher and secondary reviewer met to discuss and resolve any disagreements about study inclusion. In the event, there was not consensus between the researcher and secondary reviewer, the second member of the dissertation committee was consulted.

Data Extraction

This researcher developed a data extraction form in collaboration with the researcher's dissertation chair. Due to the rapid nature of this review, data extraction was performed solely by this researcher using Microsoft Excel. Data extracted included article details (e.g., author name(s), country, and publication date); study characteristics (e.g., study aims, setting, population and sample size, and research design); key outcomes (e.g., prevalence of psychotropic medication adherence, methodology to measure medication adherence, factors affecting medication adherence, and strategies and interventions to achieve medication adherence); and key findings. The data were summarized based on the general characteristics of the studies, including study characteristics and population demographics. Additional content such as medication prevalence, measures, and

strategies were charted separately. Also, factors that were positively and negatively associated with medication adherence were presented separately by study and under the WHO's five interacting dimensions (e.g., social/economic, condition, therapy, health care team/system, and patient) of medication adherence along with an added dimension of correctional/institutional setting. Consistent with a scoping review protocol, this researcher did not perform a methodological quality appraisal of the included studies (Munn et al., 2018).

Synthesis of Results

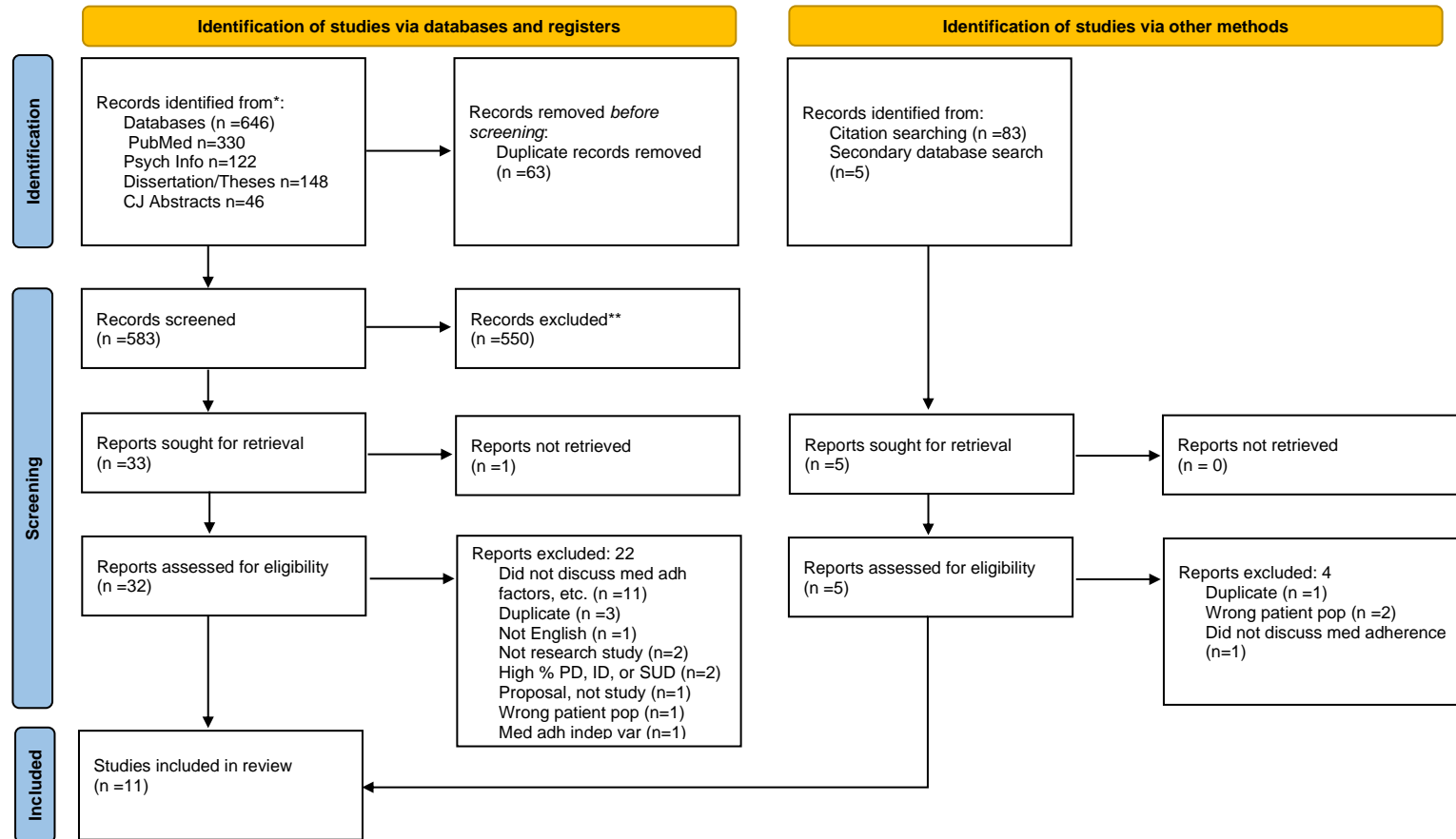
Data were summarized using text, tables, and figures. The search and selection process are demonstrated through a PRISMA flow diagram. The results were summarized based on the purpose of the review and research questions.

CHAPTER 3: RESULTS

Selection of Studies

The search for studies was conducted in November 2021 and again in January 2022 for all four databases. A total of 646 studies were identified for screening. Of these studies, 63 duplicates were removed and the title and abstract of the remaining 583 studies were screened. Of these studies, 33 required full text review and one study was not able to be retrieved. Ten studies met criteria for data extraction. In January 2022, the secondary search of the 4 databases yielded 5 additional studies, but initial screening by this researcher determined that none met inclusion criteria. Following this secondary search, titles of included studies were put through the citation index of Scopus. From this search, a total of 83 article titles and abstracts were screened by this writer alone. This yielded five studies for full text review by this researcher and the second reviewer which produced one additional study for inclusion. In total, 11 studies met inclusion criteria for data extraction. Please see the PRISMA flow diagram in Diagram 1.

Diagram 1. PRISMA Flow Diagram



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>

Overview of Included Studies

Eleven articles met inclusion criteria for this rapid scoping review (two articles originated from the same mixed method study, but reported separately on quantitative and qualitative findings). Table 1 provides an overview of these studies by author, study design, data collection methodology, aims, and key findings.

Table 1. Author, Study Design, Data Collection Methodology, Aims & Key Findings

Author(s)/Year	Study Design	Data Collection Methodology	Study Aims	Key Findings
Jacques Baillargeon, et al. (2000)	Descriptive	Medical record review	Assess whether inmates prescribed SSRIs had better medication compliance than those prescribed tricyclics	<ul style="list-style-type: none"> ▪ No evidence expanded SSRI use improved medication compliance with prisoners treated for depression ▪ Medication compliance scores positively correlated with age ▪ Men demonstrated higher compliance than women
David Farabee, et al. (2004)	Descriptive	Self-report Urine analysis	Examine impact of three program-level factors (coercion, antipsychotic type, and guardian supervision) on antipsychotic medication adherence among parolees mandated to outpatient care	<ul style="list-style-type: none"> ▪ Atypical antipsychotics and guardian supervision predictors of medication adherence ▪ Combination of atypical antipsychotics with guardian supervision associated with tenfold increase adherence ▪ No significant impact of perceived coercion on adherence ▪ African American parolees less likely than White or Hispanic parolees to test positive for antipsychotic medication ▪ Younger patients less likely than older to test positive for antipsychotic medication
Richard Gray, et al. (2008)	Mixed methods (quantitative findings)	Case notes Self-report	Explore relationships between medication adherence and demographic, prison, social, and clinical factors	<ul style="list-style-type: none"> ▪ Adherence to prescribed antipsychotic medication among prisoners similar to community samples and not correlated with prison-related factors ▪ Adherence not associated with demographic factors (e.g., age, gender, ethnicity, or academic achievement) ▪ Psychopathology not correlated with adherence ▪ Study found association between adherence and insight ▪ Prisoners who self-administer found less adherent with medication ▪ Prisoner self-report of perceived frequency of side effects not related to adherence ▪ Adherence enhanced if personal relevance of medication increased

Alice Mills, et al. (2011)	Mixed methods (qualitative findings)	Self-report	Investigate prisoners' subjective experiences of antipsychotic medication, how this and aspects of prison environment and routine affect medication adherence, satisfaction	<ul style="list-style-type: none"> Reinforced quantitative findings of mixed methods study Prison a stabilizing factor, may promote medication adherence Medication side effects did not affect adherence Coercion not an influencing factor in medication adherence Adherence enhanced if personal relevance of medication increased
Cristina Cavezza, et al. (2013)	RCT	Self-report	Examine effects of 'adherence therapy' on medication compliance and attitudes towards medication in forensic psychiatric inpatients, on patients' perceptions and attitudes being in hospital, and motivation to engage in therapeutic interventions	<ul style="list-style-type: none"> Adherence therapy approach using CBT and MI may be effective with forensic populations if paced, individualized to needs of offenders Adherence therapy most beneficial to implement once patients demonstrate compliance and insight
Megan Ehret, et al. (2013)	RCT	Clinical record review Self-report	Explore differences in medication adherence between TIMA and TAU, psychotropic medication patterns over time, changes in symptoms or adherence patterns	<ul style="list-style-type: none"> TIMA-based algorithm increased medication adherence in sample of female inmates with bipolar disorder Increased role of algorithms or decision support protocols in correctional settings may improve medication adherence Improvement in adherence found if clinicians assisted patients with education, use of decision supported protocol for at least 12 weeks with few missed doses
Kenji Murasugi, et al. (2015)	Quasi-experimental pilot	Self-report	Examine utility of Medication Discontinuation Program (MDP) that discontinues antipsychotic drugs, monitors changes in psychiatric symptoms	<ul style="list-style-type: none"> MDP has possibility of improving medication adherence MDP may have multidirectional and stimulatory effects on medication adherence

Stacy Calhoun (2018)	RCT (secondary analysis of original study)	Self-report	Determine if patient-rated working alliance a significant predictor of low psychiatric medication adherence for parolees with SMI when controlling for substance use (alcohol and illegal drug use), and demographic factors (i.e., age and ethnicity); secondary data analysis of original RCT	<ul style="list-style-type: none"> ▪ Clinician-patient working alliance not found to be significant predictor of medication adherence ▪ Race and age not found to be significant predictor of low psychiatric medication adherence during follow-up period ▪ Alcohol and/or illegal drug use found to be significantly associated with low medication adherence
Allison Robertson, et al. (2018)	Quasi-experimental	Administrative data review	Examine effect of Medication-Assisted Treatment (MAT) on behavioral health treatment utilization and criminal justice outcomes	<ul style="list-style-type: none"> ▪ Clinical benefits of MAT strong for adults with SMI and co-occurring alcohol dependence, including reductions in psychiatric hospitalizations, ED visits, and improved adherence to psychiatric medication
Michelle Herrera (2020)	Descriptive	Medical record review Self-report Observational rating	Explore relationship between perceived social support within institution, treatment compliance (i.e., both medication adherence and psychosocial group therapy engagement), and institutional aggression in forensic psychiatric sample	<ul style="list-style-type: none"> ▪ Tentative finding of greater medication adherence with perceived treatment team support
Seon Yeong Kim, et al. (2020)	Validation study	Analysis of chemical compounds	Develop and validate analytical method based on LC-MS-MS for antipsychotic drugs and metabolites for monitoring medication compliance of probationers with SMI to prevent recurrence of crimes	<ul style="list-style-type: none"> ▪ LC-MS-MS analytical method an effective way to enhance management of probationers with SMI in Medication Compliance Monitoring System (MCMS)

Characteristics of Included Studies

Characteristics of the included studies are summarized below. Population demographics, including country, setting, diagnosis, medication type, gender, race/ethnicity, and age are presented in Table 2.

Researcher demographics

The disciplines and nationalities of the researchers were diverse. The studies were published in five countries including the United States (Baillargeon et al., 2000; Farabee et al., 2004; Ehret et al., 2013; Calhoun, 2018; Robertson et al., 2018; Herrera, 2020), the United Kingdom (Gray et al., 2008; Mills et al., 2011), Australia (Cavezza et al., 2013), Japan (Murasugi et al., 2015), and Korea (Kim et al., 2020). Many of the studies had multiple authors from various disciplines. The majority of researchers had a psychology background, followed by psychiatry, social work, and nursing. Other disciplines included pharmacology, public health, sociology, chemistry, and social and health sciences.

Study design

Of the 11 studies, ten were quantitative and one was qualitative. Of the quantitative studies, three were RCT (Cavezza et al., 2013; Ehret et al., 2013; Calhoun, 2018), two were quasi-experimental (Murasugi et al., 2015; Robertson, et al., 2018), three were descriptive (Baillargeon, et al., 2000; Farabee et al., 2004; Herrera, 2020), and one was a validation study (Kim et al., 2020). In addition, two articles, one focusing on quantitative results and the other on qualitative, originated from one mixed methods study with the same prison population sample (Gray et al., 2008; Mills et al., 2011).

Setting

With respect to study setting, four were prisons (Baillargeon et al., 2000; Gray et al., 2008; Mills et al., 2011; Ehret et al., 2013), three were secure forensic psychiatric hospitals (Cavezza et al., 2013; Murasugi et al., 2015; Herrera, 2020), two were parole (Farabee et al., 2004; Calhoun, 2018), one was probation (Kim et al., 2020), and one required at least one night in jail or prison (Robertson et al., 2018). There were no jail studies that met inclusion criteria.

Year

There were no studies published between 1990-1999 that met inclusion criteria. Three studies meeting inclusion criteria were published between 2000-2010 (Baillargeon, et al., 2000; Farabee et al., 2004; Gray et al., 2008) and eight studies meeting inclusion criteria were published between 2011-2021 (Mills et al., 2011; Cavezza et al., 2013; Ehret et al., 2013; Murasugi et al., 2015; Calhoun, 2018; Robertson et al., 2018; Herrera, 2020; Kim et al., 2020).

Population Sample

The total number of participants in this rapid scoping review was 8963, with study populations ranging from 24 to 5,743. The mixed methods study using the same population sample for two articles was counted once (Gray et al., 2008; Mills et al., 2011).

Psychiatric disorder

For the purposes of this study, inclusion criteria included bipolar and related disorders, depressive disorders, and schizophrenia spectrum and other psychotic disorders. Six studies (Farabee et al., 2004; Gray et al., 2008; Mills et al., 2011; Cavezza et al., 2013; Murasugi et al., 2015; Kim et al., 2020) included these diagnoses. Three studies (Calhoun, 2018; Herrera, 2020; Kim et al., 2020) did not explicitly identify the diagnoses of the participants, but discussion of psychiatric medication, including antipsychotics, and type of setting (e.g., parole outpatient clinic

and forensic state hospital) suggested the study met inclusion criteria. One study focused exclusively on depressive disorders (Baillargeon et al., 2000) and another on bipolar disorder (Ehret et al., 2013).

Medication type

Eight of the studies (Baillargeon et al., 2000; Farabee et al., 2004; Gray et al., 2008; Mills et al., 2011; Cavezza et al., 2013; Ehret et al., 2013; Murasugi et al., 2015; Kim et al., 2020) discussed the type of medication prescribed, but three did not (Calhoun, 2018; Robertson et al., 2018; Herrera, 2020). The most commonly referenced medications included typical and atypical antipsychotics (discussed in seven studies), followed by antidepressants, then lithium.

Gender

Nine studies included men and women (Baillargeon et al., 2000; Farabee et al., 2004; Gray et al., 2008; Mills et al., 2011; Cavezza et al., 2013; Murasugi et al., 2015; Calhoun, 2018; Robertson et al., 2018; Herrera, 2020). The percentage of women in the mixed gender studies ranged from 15% to 33%. One study focused on women only (Ehret et al., 2013). One study was a validation study and did not report gender (Kim et al., 2020).

Race/Ethnicity/Nationality

The race or ethnicity of the participants appeared to reflect the country or region where the study took place. Three U.S. studies reported a majority of white participants (Baillargeon et al., 2000; Ehret et al., 2013; Robertson, et al., 2018), and two U.S. studies reported a larger percentage of African American participants than other racial groups (Farabee et al., 2004; Herrera, 2020). An additional U.S. study recorded race as a dichotomous finding of African American heritage (Calhoun, 2018). In that sample, non-African American participants were the majority. The studies in the U.K. and Australia also reported a majority of white participants as

compared to other ethnic groups (Gray et al., 2008; Mills, et al., 2013; Cavezza, et al., 2013). The studies conducted in Japan and Korea did not report on race, ethnicity, or national origin (Murasugi et al., 2018; Kim et al., 2020).

Age

Study participants were adults with an age range from 18 to 50+ years old. One study did not report age (Kim et al., 2020). Nine studies provided a mean age value that ranged from 32.7 to 45.3 years old (Baillargeon et al., 2000; Gray et al., 2008; Mills et al., 2011; Ehret et al., 2013; Cavezza et al., 2013; Murasugi et al., 2015; Calhoun, 2018; Robertson et al., 2018; Herrera, 2020). Another study provided an age breakdown, but no mean value (Farabee et al., 2004).

Table 2. Population Demographics

Author(s)/ Year	Population Description	Gender	Race/Ethnicity	Age
Jacques Baillargeon et al. (2000)	<ul style="list-style-type: none"> USA 2,554 prison inmates Major depression, dysthymia, or bipolar disorder Tricyclic antidepressants or SSRIs for at least two months during the study period 	<ul style="list-style-type: none"> Male (n=2178, 85%) Female (n=376, 15%) 	<ul style="list-style-type: none"> White (n=1304, 51%) Hispanic (n=950, 37%) Black (n=300, 12%) 	<ul style="list-style-type: none"> 18-29 (n=655, 26%) 30-49 (n=1718, 67%) 50+ (n=181, 7%)
David Farabee et al. (2004)	<ul style="list-style-type: none"> USA 150 parolees Schizophrenia, bipolar disorder, and schizoaffective disorder Parole outpatient clinic enrollment within the previous 30 days Prescribed antipsychotic medication at least 1 week prior to enrollment 	<ul style="list-style-type: none"> Male (76.5%) Female (23.5%) 	<ul style="list-style-type: none"> African American (71%) White (13.5%) Hispanic (9.5%) Other race (3.5%) 	<ul style="list-style-type: none"> Mean age 41.1 Specific breakdown in age-related data not provided
Richard Gray et al. (2008)	<ul style="list-style-type: none"> UK 44 prison inmates 2 male prisons, 1 female prison 18 years and older Prescribed antipsychotic medication to treat a psychiatric disorder 	<ul style="list-style-type: none"> Male (n=36, 82%) Female (n=8, 18%) 	<ul style="list-style-type: none"> White (n=27, 61%) Black Caribbean (n=6, 14%) Asian (n=6, 14%) Other (n=3, 7%) Black African (n=2, 5%) 	<ul style="list-style-type: none"> 19-61 years old Mean age 37 years (SD 8.99)
Alice Mills et al. (2011)	<ul style="list-style-type: none"> UK 44 prison inmates 2 male prisons, 1 female prison 18 years and older Prescribed antipsychotic medication to treat a psychiatric disorder 	<ul style="list-style-type: none"> Male (n=36, 82%) Female (n=8 (18%) 	<ul style="list-style-type: none"> White (n=27, 61%) Black Caribbean (n=6, 14%) Asian (n=6, 14%) Other (n=3, 7%) Black African (n=2, 5%) 	<ul style="list-style-type: none"> 19-61 years old Mean age 37 (SD 8.99)
Cristina Cavezza et al. (2013)	<ul style="list-style-type: none"> Australia 48 forensic psychiatric hospital patients Diagnosis of a psychotic illness Prescribed antipsychotic medication 	<ul style="list-style-type: none"> Male (n=39, 81%) Female (n=9, 19%) 	<ul style="list-style-type: none"> Caucasian (n=35, 73%) Asian (n=4, 8%) Aboriginal/Torres Strait Islander (n=4, 8%) Pacific Islander (n=3, 7%) Middle Eastern (n=2, 4%) 	<ul style="list-style-type: none"> Mean age (experimental group) =36 Mean age (control group) =34 Specific breakdown in age-related data not provided

Megan Ehret et al. (2013)	<ul style="list-style-type: none"> USA 60 adult female prison inmates Diagnosed with Bipolar disorder I or II Capable of giving consent 	<ul style="list-style-type: none"> Female only 	<ul style="list-style-type: none"> White (74%) African American (14%) Other racial/ethnic identification (12%) 	<ul style="list-style-type: none"> 18-48 years old Mean age 32.7 Specific breakdown in age-related data was not provided
Kenji Murasugi et al. (2015)	<ul style="list-style-type: none"> Japan 24 forensic psychiatric hospital patients (I=7, C=17) Diagnosed with schizophrenia Did not show improvement in medication adherence during standard treatment (including single atypical antipsychotic therapy, psychoeducation on disease, and neuroleptics). Exhibited strong denial of diagnosis and medication refusal. Score of more than 70 on the WAIS-III Score of more than 41 on the GAF 	<ul style="list-style-type: none"> I: male n=6, female n=1 C: male n=15, female n=2 	<ul style="list-style-type: none"> Not reported 	<ul style="list-style-type: none"> Mean age 45.3 (SD 9.3)
Stacy Calhoun (2018)	<ul style="list-style-type: none"> USA 104 parolees receiving outpatient treatment Subset of that study with an n=49 	<ul style="list-style-type: none"> Male 67% Female 33% 	<ul style="list-style-type: none"> African American 35% Non-African American 65% 	<ul style="list-style-type: none"> 19-61 years old Mean 38.7 (SD=9.9)
Allison Robertson et al. (2018)	<ul style="list-style-type: none"> USA 5,743 adults Schizophrenia spectrum disorder, bipolar disorder, or major depressive disorder comorbid with moderate to severe alcohol dependence Incarcerated for at least one night during the study window (2002–2009) 	<ul style="list-style-type: none"> I: female (n=273, 30%) male (n=623, 70%) C: female (n=1543, 32%) male (n=3304, 68%) 	<ul style="list-style-type: none"> I: Caucasian (n=698, 78%) African American (n=130, 14.5%) Hispanic/Latino (n=60, 7%) Other (n=8, 1%) C: Caucasian (n=2593, 53.5%) African American (n=1560, 32%) Hispanic/Latino (n=676, 14%) Other (n=18, less than 0.5%) 	<ul style="list-style-type: none"> I: 41.95 (SD 8.83) C: 38 (SD 9.87)
Michelle Herrera (2020)	<ul style="list-style-type: none"> USA 49 incompetent to stand trial patients Forensic psychiatric hospital 	<ul style="list-style-type: none"> Male n=38 (78%) Female n=11 (22%) 	<ul style="list-style-type: none"> Caucasian (n=11, 22%) African American (n=16, 33%) Latino (n=7, 14%) Asian/Pacific Islander (n=4, 8%) Other (n=5, 10%) 	<ul style="list-style-type: none"> Mean age 34.2 (SD 10.4)

Seon Yeong Kim et al. (2020)	<ul style="list-style-type: none"> ▪ Korea ▪ 242 urine samples of mentally disordered probationers who take prescribed antipsychotic drugs orally 	<ul style="list-style-type: none"> ▪ Not reported 	<ul style="list-style-type: none"> ▪ Not reported 	<ul style="list-style-type: none"> ▪ Not reported
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Medication Adherence Prevalence and Measures

In this rapid scoping review, one of the inclusion criteria was medication adherence as the dependent variable in the study. All studies reported on the prevalence of medication adherence, but description and measurement of adherence varied across studies. Descriptions of medication adherence prevalence and measures from the studies are presented in Table 3.

As shown in Table 3, prevalence was generally reported as a percentage or numerical value. Additionally, some studies (Baillargeon et al., 2000; Farabee, 2004; Gray et al., 2008; Mills et al., 2011; Herrera, 2020; Kim et al., 2020) reported a single medication compliance mean rate, while others had baseline and post-intervention measurements of medication adherence (Cavezza et al., 2013; Ehret et al., 2013; Murasugi et al., 2015; Calhoun, 2018; Robertson et al., 2018). Medication adherence was measured in various ways. Some studies used a computation based on number of doses taken divided by the number of doses prescribed (Baillargeon et al., 2000; Ehret et al., 2013). Two studies determined that a positive urine result for metabolites indicated medication ingestion and therefore adherence (Farabee et al., 2004; Kim et al., 2020). Others indicated adherence based solely on self-report or subjective rating scale (Gray et al., 2008; Mills et al., 2011; Cavezza et al., 2013; Murasugi et al., 2015; Calhoun, 2018). One study used a medication possession ratio as a proxy for adherence by calculating the monthly medication possession ratio as the proportion of days in a month in which the person had a supply of psychotropic medication (Robertson et al., 2018). One study measured adherence as the number of days before being restarted on medication (Murasugi et al., 2015). Another measured it as a quantified percentage of instances per day in which the person took the medication when offered (Herrera, 2020). The most used adherence measure was self-report via qualitative interview (Mills et al., 2011) or quantitative clinical measures such as the Clinical

Rating Scale (CRS), Drug Attitude Inventory (DAI-30), and the eight-item Morisky Medication Adherence Scale (MMAS-8) (Gray et al., 2008; Cavezza et al., 2013; Murasugi et al., 2015; Calhoun, 2018).

Definitions of Adherence and Non-Adherence

There was no consistent definition or measure of medication adherence. As such, the definition of adherence differed by study and means of measurement. Studies used either a rate of compliance that was computed by doses taken and reported as a percentage, a rate of medication possession ratio, a dichotomous finding based on chemical testing or medication possession ratio, or a number value that indicated a range or level of adherence.

Table 3. Medication Prevalence and Measures

Author(s), Year	Medication Prevalence	Adherence Measure(s)
Jacques Baillargeon et al. 2000	<ul style="list-style-type: none"> Overall median compliance rate was .79. Tricyclic antidepressants had a higher median score than SSRIs (.80 vs .75) 	<ul style="list-style-type: none"> Number of doses taken was divided by the number of doses prescribed during the study period. Scores were calculated separately for tricyclics and SSRIs.
David Farabee et al., 2004	<ul style="list-style-type: none"> Overall, 70.7% tested positive for prescribed antipsychotic medication. 	<ul style="list-style-type: none"> Urine analysis for metabolite indicating ingestion of antipsychotic medication.
Richard Gray et al., 2008	<ul style="list-style-type: none"> 5.09 (SD 1.63) Indicates "passive acceptance" 	<ul style="list-style-type: none"> Clinician Rating of Compliance scale Scale uses 7-point scale indicating complete refusal, partial refusal, reluctant acceptance, occasional reluctance about treatment, passive acceptance, moderate participation, active participation.
Alice Mills et al., 2011	<ul style="list-style-type: none"> "Largely adherent" per self-report 	<ul style="list-style-type: none"> Interviews
Cristina Cavezza et al., 2013	<ul style="list-style-type: none"> Before intervention 5.3 (SD 1.7) After intervention 5.9 (1.1) 	<ul style="list-style-type: none"> Clinical Rating Scale (CRS) Adherence is self-reported using a 7-point scale from complete refusal to active participation. RN determines score.
Megan Ehret et al., 2013	<ul style="list-style-type: none"> TIMA mean baseline adherence .835 (SD .266) Week 7 adherence .941 (SD .082) TAU mean baseline adherence .908 (SD .201) Week 7 adherence .920 (SD .093) 	<ul style="list-style-type: none"> Number of doses administered per direct observation and medication administration record Calculated as a proportion of the total number of doses prescribed

Kenji Murasugi et al., 2015	<ul style="list-style-type: none"> Pre-MDP DAI mean score -2.6 +/- 13.2 Post-MDP DAI mean score 18.3 +/- 9.2 Number of days before medication re-administration ranged from 2 to 36 	<ul style="list-style-type: none"> Change in Drug Attitude Inventory (DAI-30) score Number of days before medication was re-administered
Stacy Calhoun, 2018	<ul style="list-style-type: none"> 71% met the criteria for low medication adherence at follow-up assessment 	<ul style="list-style-type: none"> Morisky Medication Adherence Scale MMAS-8 scores range from 0 to 8 Three levels of adherence: <ul style="list-style-type: none"> high adherence (score = 8) medium adherence (score of 6–<8) low adherence (Score < 6).
Allison Robertson et al., 2018	<ul style="list-style-type: none"> Pre-index <ul style="list-style-type: none"> MAT group mean .55 (SD .35) Comparison group mean .62 (SD .41) Post MAT odds ratio was 1.57 (1.28-1.93) 	<ul style="list-style-type: none"> Medication possession ratio served as a proxy for adherence. Monthly medication possession ratio was calculated as the proportion of days in a month in which an individual had a supply of psychotropic medication. Dichotomous indicator was used to determine whether the medication possession ratio was at least 80% within a given month.
Michelle Herrera, 2020	<ul style="list-style-type: none"> Overall, 65.3% were 100% adherent. 6.1% were less than 50% adherent. All others were 81% adherent or higher. 	<ul style="list-style-type: none"> Percentage of instances per day in which the medication was taken when offered.
Seon Yeong Kim et al., 2020	<ul style="list-style-type: none"> 83.4% were “positive” 16.5% were “negative” 	<ul style="list-style-type: none"> Positive result for targeted chemical compounds in urine analysis

Quantitative Clinical Measurement Scales and Inventories

This rapid scoping review identified three quantitative clinical measurement scales or inventories used in several of the included studies to measure medication adherence—the Clinical Rating Scale (Gray et al., 2008; Cavezza et al., 2011), the Drug Attitude Inventory (Murasugi et al., 2015), and the Morisky Medication Adherence Scale (Calhoun, 2018).

As described by Gray et al. (2008), the Clinical Rating Scale (CRS) uses a seven-point scale to quantify a clinician's assessment of adherence as demonstrated by the patient. The higher the number on the scale corresponds to the greater the degree of adherence. The level of adherence is demonstrated by rating the statement that relates to the patient's behavior. The scale is as follows—1) complete refusal, 2) partial refusal or only accepts minimum dose, 3) accepts only because compulsory, or very reluctant/requires persuasion, or questions the need for medication, 4) occasional reluctance, 5) passive acceptance, 6) moderate participation, some knowledge and interest in medication and no prompting required, and 7) active participation, readily accepts, and shows some responsibility for regimen

The Drug Attitude Inventory (DAI-30) was developed by Hogan et al. (1983) to measure a patient's perceptions and attitudes toward treatment. The original scale is 30 statements, half of which are phrased positively and half negatively, to which patients provide true/false responses (Nielson et al., 2012). With respect to scoring, responses in bold are scored +1 and responses in normal font are scored -1. The total score is calculated as the sum of the positive scores minus the negative scores. Adherence is reflected by a positive total score. In addition, there are subscales of the DAI-30 that indicate awareness of the need for medication, awareness of the effects of psychiatric drugs, and impression of medication (Murasugi et al., 2015).

As described by Calhoun (2018), the Morisky Medication Adherence Scale (MMAS-8) is a scale that has been used as a proxy for medication adherence. Scores range from 0 to 8 and total scores are categorized into three levels of adherence—high (score of 8), medium (score between 6 to <8), and low (score less than 6). The MMAS-8 measure was not available for review of its content; it is protected by U.S. copyright and trademark laws and cannot be used without permission by the author.

Factors Affecting Medication Adherence

Study review findings suggest that several factors contribute to a patient's adherence or non-adherence to medication. Factors positively and negatively associated with medication adherence are presented in Tables 4 and 5, respectively. The oft referenced WHO's five dimensions of adherence were used as a guideline to extract factors affecting medication adherence: social/economic factors, condition-related factors, therapy-related factors, health care team/system factors, and patient-related factors (Sabate, 2003). One additional component was added to reflect the impact of the correctional environment as discussed by Cuthbertson et al. (2018).

Social/Cultural/Economic

Two studies reported results on this dimension. In the study of parolees in an outpatient clinic, Farabee et al. (2004) identified race and age as potential factors that affect medication adherence among parolees. Farabee et al. (2004) found that African American parolees were less likely than white and Hispanic parolees to test positive for their prescribed antipsychotics and that younger parolees were less likely than older parolees to do the same. In contrast, Calhoun (2018) found that age and ethnicity were not significant predictors of medication adherence.

Correctional/Institutional Setting

Three studies reported results on the dimension of correctional/institutional setting. Farabee et al. (2004) found that guardian supervision (e.g., staff at shelters, halfway houses, or similar-type residences) was associated with increased medication adherence. More significantly, this study found that patients with guardian supervision and who were prescribed atypical antipsychotics were ten times more likely to be medication adherent. In the study by Gray et al. (2008), the researchers reported higher rates of adherence when staff administered medication than when it was self-administered. This study also found no correlation between prison-related factors (such as prior convictions, number of years incarcerated, and violent or behavioral disturbances) and adherence. In a related publication that reported qualitative findings with the same population, Mills et al. (2011) found that while the structure and routine of the prison setting enhanced adherence for some, it also had negative impacts on medication adherence. Study participants explained that scheduling conflicts, such as pill call and mealtime being held at the same time, or having little choice about when to take medication negatively impacted adherence.

Illness/Condition

Condition-related factors, such as co-morbid substance use, are known modifiers of adherence behavior (Sabate, 2003). Mills et al. (2011) found that substance use negatively impacted medication adherence. Similarly, Calhoun (2018) found that parolees in an outpatient treatment clinic who reported substance use in their follow-up interviews had lower rates of medication adherence.

Treatment/Therapy/Medication

Type and administration of medication were associated with higher rates of adherence. Tricyclic antidepressants and atypical antipsychotics were associated with higher rates of adherence than SSRIs and typical antipsychotics, respectively (Baillargeon et al., 2000; Farabee et al., 2004). Baillargeon et al. (2000) also found that the use of SSRIs had no effect on the rate of medication adherence in their study of prisoners. Additionally, prisoners who took oral antipsychotic medications were more adherent than those who were given long-acting depot injections (Gray et al., 2008).

Several studies demonstrated the positive impact of organized and comprehensive programs of different types. An adherence therapy program (Cavezza et al., 2013), algorithms and decision support protocols (Ehret et al., 2013), and a medication discontinuation program (Murasugi et al., 2015) all demonstrated positive impact on medication adherence. Cavezza et al. (2013) suggested that programs rooted in Motivational Interviewing and Cognitive Behavioral Therapy were likely to be effective with forensic populations if paced and individualized to the needs of the participant. In the study by Murasugi et al. (2015), the researchers reported that treatment alliance, psychoeducation, patient involvement, and the long-term nature of the program likely had positive impacts on medication adherence. Finally, for those with a co-occurring alcohol use disorder, participation in a medication assisted treatment program had a positive impact on medication adherence (Robertson et al., 2018).

Health Care System/Provider

Positive relationships with the provider, especially with respect to empathy and communication, resulted in higher rates of medication adherence with prisoners (Mills et al., 2011). Conversely, an aloof or impersonal relationship with the provider, including one with

poor communication and/or empathy, had a negative impact on medication adherence (Mills et al., 2011). In contrast, Calhoun (2018) reported that the perceived clinician-patient alliance was not a significant predictor of medication adherence. Finally, in a doctoral dissertation study with forensic state hospital patients, Herrera (2020) reported a tentative finding that social support, specifically from the treatment team, had a positive impact on medication adherence, although perceived social support generally did not.

With respect to treatment pressures, Farabee et al. (2004) found that perceived coercion had minimal effect on medication adherence. Similarly, Mills et al. (2011) found that coercion had no impact on medication adherence.

Patient Factors

Patient-related factors such as insight, positive attitude toward treatment, prior history of treatment adherence, and positive perception of treatment efficacy were positively correlated with medication adherence (Gray et al., 2008). In a related study by Mills et al. (2011), the researchers found similar results in that poor medication efficacy and side effects had a negative impact on medication adherence, as did other clinical factors like insight and prior treatment adherence.

Table 4. Factors Positively Associated with Medication Adherence

Study	Social/Cultural/ Economic	Correctional/ Institutional Setting	Illness/ Condition	Treatment/Therapy/ Medication	Health Care System/Provider	Patient
Jacques Baillargeon et al. (2000)	<ul style="list-style-type: none"> Male gender Older age 			<ul style="list-style-type: none"> Tricyclic antidepressant 		
David Farabee et al. (2004)	<ul style="list-style-type: none"> Older age 	<ul style="list-style-type: none"> Guardian supervision Combined guardian supervision and atypical antipsychotic (10x impact) Trend for increased compliance with perception of higher levels of coercion 		<ul style="list-style-type: none"> Atypical anti-psychotic 		
Richard Gray et al. (2008)		<ul style="list-style-type: none"> Staff administration of medication 		<ul style="list-style-type: none"> Oral antipsychotic (vs. long-acting depot injections) 		<ul style="list-style-type: none"> Prior treatment compliance Insight Positive attitude toward treatment Perception of treatment efficacy
Alice Mills et al. (2011)		<ul style="list-style-type: none"> Prison structure and routine 			<ul style="list-style-type: none"> Provider communication Provider empathy 	
Cristina Cavezza et al. (2013)				<ul style="list-style-type: none"> Adherence therapy (CBT and MI) 		
Megan Ehret et al. (2013)				<ul style="list-style-type: none"> Algorithm or decision support protocols 		

Kenji Murasugi et al. (2015)				<ul style="list-style-type: none"> Medication Discontinuation Program (i.e., treatment alliance, psychoeducation, patient involvement, length of program) 		
Stacy Calhoun (2018)						
Allison Robertson et al. (2018)				<ul style="list-style-type: none"> Medication Assisted Treatment 		
Michelle Herrera (2020)					<ul style="list-style-type: none"> Social support from treatment team (tentative finding) 	
Seon Young Kim et al. (2020)						

Table 5. Factors Negatively Associated with Medication Adherence

Study	Social/Cultural/ Economic	Correctional/ Institutional Setting	Illness/ Condition	Treatment/Therapy/ Medication	Health Care System/Provider	Patient
Jacques Baillargeon et al. (2000)	<ul style="list-style-type: none"> Younger age Female 					
David Farabee et al. (2004)	<ul style="list-style-type: none"> African American race 					
Richard Gray et al. (2008)		<ul style="list-style-type: none"> Self-administration of medication 				
Alice Mills et al. (2011)		<ul style="list-style-type: none"> Inflexibility of prison structure Bullying by peers 	<ul style="list-style-type: none"> Substance use 	<ul style="list-style-type: none"> Poor efficacy Medication side effects 	<ul style="list-style-type: none"> Poor provider communication Lack of provider empathy 	<ul style="list-style-type: none"> Forgetfulness Poor insight Poor prior treatment compliance
Cristina Cavezza et al. (2013)						
Megan Ehret et al. (2013)						
Kenji Murasugi et al. (2015)						
Stacy Calhoun (2018)			<ul style="list-style-type: none"> Substance use in follow up period 			
Allison Robertson et al. (2018)						
Michelle Herrera (2020)						
Seon Yeong Kim, et al. (2020)						

Strategies, Interventions, and Outcomes

Five of the 11 studies evaluated the effectiveness of several different strategies or interventions to improve medication adherence with forensic populations in either institutional or community settings (Cavezza et al., 2013; Ehret et al., 2013; Murasugi et al., 2015; Robertson et al., 2018; Kim et al., 2020). These strategies ranged from simple interventions, like urine testing, to more complex interventions like the use of a medication algorithm or comprehensive medication adherence program. The remaining studies discussed the influence of certain factors on medication adherence, absent a specific intervention program (Baillargeon et al., 2000; Farabee et al., 2004; Gray et al., 2008; Mills et al., 2011; Calhoun, 2018; Herrera, 2020). The outcomes of all of the studies are discussed by setting below.

Prison

Out of the four studies relating to prisoners, two originated from the United States (Baillargeon et al., 2000; Ehret et al., 2013) and two from the United Kingdom (Gray et al., 2008; Mills et al., 2011). Only one study discussed a specific medication adherence program for prisoners (Ehret et al., 2013). Ehret et al. (2013) studied the differences in medication adherence between two groups of inmates in a U.S. prison diagnosed with bipolar disorder treated with either the Texas Implementation of Medication Algorithm (TIMA) for Bipolar Disorder or treatment as usual (TAU). As pharmacotherapy is often the standard treatment for the majority of people incarcerated in jails and prisons (Thorburn, 1995 as cited by Shelton et al., 2010), it was thought that adaptation of a medication algorithm to a correctional milieu would improve treatment outcomes. Previous to this study, a two-phase study had determined that the Texas Implementation of Medication Algorithm (TIMA) could be used in a correctional environment with promising results, but preliminary findings suggested that there were no differences in

outcome between the intervention and control groups. Using an RCT study design, the authors set out to explore whether there were any differences in medication adherence between the two groups, any changes in psychotropic medication patterns over time and changes in symptoms or patterns of adherence. For both groups, the researchers found an expected pattern of adherence increasing over time with symptoms decreasing over time. However, they also found that the TIMA-based algorithm increased medication adherence for this population of female inmates with bipolar disorder. In addition, the researchers found that patient education and the use of the decision supported protocol for at least 12 weeks with few missed doses resulted in sustained improvement in adherence over time.

The study by Baillargeon et al. (2000) set out to explore whether U.S. prisoners in the Texas prison system prescribed SSRIs would have better medication adherence than those prescribed tricyclic antidepressants. The researchers found no evidence that use of SSRIs with this population would improve adherence to pharmacological treatment. However, the results suggested that the use of tricyclic antidepressants, male gender, and older age were positively correlated with medication compliance scores.

Finally, a mixed methods study was performed with a prison population in the United Kingdom (Gray et al., 2008; Mills et al., 2011). The results were reported in two studies, one focusing on quantitative findings, the other on qualitative. Gray et al. (2008) found that adherence to prescribed antipsychotic medication among prisoners with psychosis was essentially similar to community samples. In this study, adherence was not correlated with any demographic factors (age, gender, ethnicity, or academic level), prison-related factors measured, duration of mental illness, or psychopathology. This study suggests, though, that staff administration of medication, rather than self-administration, promotes adherence. Also, an

association was found between adherence and insight. Adherence was further explained by the perceived efficacy of treatment, motivation to take medication, and weight gain. The conclusion of the researchers was that adherence may be enhanced in this population if the personal relevance of medication is addressed.

Mills et al. (2011) reached similar conclusions in their qualitative results with the same study population. They noted that the stabilizing effect of the prison routine appears to enhance medication adherence, while also finding that inflexible prison rules may have the opposite effect. In addition, Mills et al. (2011) found that most prisoners in the study valued the efficacy of the medication which, in turn, reinforced their adherence even if undesirable side effects were experienced. Interestingly, most study participants reported that coercion did not have an effect on medication. Finally, quality of provider communication and level of empathy were reported to be positively associated with medication adherence.

Forensic Psychiatric Hospital

There were three studies related to medication adherence studies of forensic psychiatric hospitals, one of each set in Australia, Japan, and the United States. Two studies described an adherence therapy program, albeit with different approaches (Cavezza et al., 2013; Murasugi et al., 2015). The other study (Herrera, 2020) was a dissertation for a doctorate level psychology program that discussed the relationships between perceived social support within the institution, treatment compliance (including medication adherence), and institutional aggression.

Cavezza et al. (2013) sought to examine the effects of an ‘adherence therapy’ approach on medication compliance and attitudes towards medication in forensic psychiatric inpatients in Australia. The researchers also studied the effects of adherence therapy on the patients' perceptions and attitudes towards being in the hospital and motivation to engage in therapeutic

interventions. In this RCT, patients in the intervention group participated in an adherence therapy program that consisted of eight sessions of interventions utilizing Motivational Interviewing (MI) and Cognitive Behavior Therapy (CBT) principles. Patients in the control group participated in standard health education classes. The researchers found that an adherence therapy approach, with its theoretical foundation based on CBT and MI, may be effective with forensic populations, if appropriately paced and individualized to the needs of offenders. They also found that patients' average compliance rating demonstrated only passive, rather than active, participation in treatment, which was consistent with the findings of another included study with prisoners in the U.K. (Gray et al., 2008). In addition, the results suggested that patients may best benefit from adherence therapy once they demonstrate some degree of compliance and insight into their illness.

In the quasi-experimental study by Murasugi et al. (2015) based in Japan, the researchers examined the utility of a Medication Discontinuation Program (MDP) that sought to improve medication adherence with forensic inpatients by discontinuing antipsychotic drugs and monitoring changes in psychiatric symptoms. In Japan, the Medical Treatment and Supervision Act (MTSA), passed in 2005, was designed to promote the social rehabilitation of people who had committed serious crimes due to their psychiatric disorder (Murasugi et al., 2015). As such, these individuals are provided with psychiatric care and supervision to address their mental illness and prevent future offenses (Murasugi et al., 2015).

The MTSA Act offers psychiatric treatment for 18 months in a forensic psychiatric hospital under the belief that treatment adherence (particularly medication) for offenders with mental illness is essential in preventing recidivism (Murasugi et al., 2015). Most patients served under the MTSA have schizophrenia and subsequent treatment under the Act includes

psychoeducation and an antipsychotic medication regimen (Murasugi et al., 2015). While most patients benefit from this approach, some patients exhibit strong denial of their illness and refuse treatment and it is this population of patients from which the intervention group participants were chosen (Murasugi et al., 2015).

The MDP provides the standard psychoeducation and pharmacological treatment to patients with an emphasis on educating the patients on warning signs of impending psychiatric crisis and potential decompensation. Medications are discontinued and symptoms are closely monitored by the patient and treatment team. Medication re-administration criteria are discussed within the treatment team and with the patient. There is agreement among the team not to re-introduce medication forcibly, but to work collaboratively with the patient on examining the need for medication and management of symptoms. Changes in symptoms are monitored both by the treatment team and patient through clinical rating scales. Particular attention is paid to the clinical subscales of the DAI-30 that assess awareness of the need for medication, awareness of the effects of psychiatric drugs, and impressions of medication. Results of the study by Murasugi et al. (2015) were promising and suggested that use of the MDP may help improve medication adherence. Treatment alliance, proactive patient involvement, and length of intervention (i.e., six months) were seen as factors that likely influenced medication adherence.

The third study on forensic inpatients and medication adherence was a doctoral dissertation by an American psychology student (Herrera, 2020). Herrera (2020) focused on pre-trial defendants who were found incompetent to stand trial and were admitted to a forensic psychiatric hospital for competency restoration. Per Herrera (2020), compliance with treatment, particularly medication, is an essential factor in restoring competency. This study explored the relationship between perceived social support within the institution, treatment compliance (i.e.,

both medication adherence and group therapy participation), and institutional aggression. Study results indicated that overall perceived social support in general was not correlated with either treatment compliance or institutional aggression. However, tentative findings from a post-hoc exploratory analyses found that patients who perceived social support specifically from treatment team members demonstrated better medication adherence.

Community-Parole and Probation

There were four studies associated with forensic populations in the community (i.e., parolees and probationers). Three of the studies originated outside of the United States (Farabee et al., 2004; Calhoun, 2018; Robertson et al., 2018) and one originated from Korea (Kim et al., 2020). Two studies focused primarily on parolees (Farabee et al., 2004; Calhoun, 2018) and one on probationers (Kim et al., 2020). The study by Robertson et al. (2018) did not specify legal status, only that the participants must have spent at least one night in jail or prison during the study window.

Farabee et al. (2004) focused on program-level predictors of antipsychotic medication adherence among parolees receiving outpatient treatment in Los Angeles. The researchers found that two of the three program-level factors emerged as significant predictors of adherence—atypical (rather than typical) antipsychotics and guardian supervision. Of particular note, the results indicated that these two factors in combination were associated with nearly a tenfold increase in the likelihood of participants testing positive for their prescribed antipsychotic agent. Although perceived coercion was found not to be significant, the researchers did note, however, a trend for those perceiving higher levels of coercion to be more likely to test positive for their prescribed antipsychotic agent. Two of the three demographic controls (race and age) were

significant in that African American and younger parolees were less likely to test positive for their prescribed antipsychotic medication.

Calhoun (2018) performed a secondary analysis of data from a study that compared telepsychiatry to standard in-person psychiatric service for parolees receiving treatment in an outpatient clinic in Los Angeles. Incidentally, that study was originally performed by Farabee et al. (2016) and the author had been part of the original research group. The study by Calhoun (2018) sought to determine if the patient-rated working alliance was a significant predictor of psychiatric medication adherence in a sample of recently released parolees with mental illness when controlling for substance use, age, and race. Interestingly, study results suggested that clinician-patient working alliance, race, and age were not significant predictors of medication adherence. However, alcohol and/or illegal drug use during the follow-up period were found to be significantly associated with low medication adherence.

The study by Kim et al. (2020) was different from the other studies included in this scoping review. Although it met inclusion criteria for this rapid scoping review, the study did not discuss a psychosocial strategy to improve medication adherence with the forensic population. Rather, it was a validation study for a chemical process used to monitor the medication compliance of probationers with a mental illness in order to prevent the recurrence of crimes. More specifically, the goal of this study was to develop and validate an analytical method based on a liquid chromatography-tandem mass spectrometry (LC-MS-MS) for commonly prescribed antipsychotic drugs and their metabolites in the Republic of Korea.

As background, in 2016, in an attempt to reduce re-offenses by individuals with mental illness, the Ministry of Justice in Korea enacted a regulation that required probationers with mental disorders to take psychotropic medication (Kim et al., 2020). In January 2019, the urine

analysis of antipsychotic medication for probationers with mental disorders was added to this regulation (Kim et al., 2020). As a result, a medication compliance system known as the Medication Compliance Monitoring System (MCMS) was developed and implemented by the government. The authors of this study were successful in developing an analytical method that could be applied to urine samples of probationers with mental disorders. They also determined that the methodology was an effective way to manage these probationers in MCMS.

The last study (Robertson et al., 2018) sought to determine the effect of Medication-Assisted Treatment (MAT) on behavioral health treatment utilization and criminal justice outcomes by examining extensive administrative data on treatment utilization and criminal justice episodes from several public agency databanks in Connecticut. The study results indicated that MAT had strong clinical benefits for adults with serious mental illness and co-occurring alcohol dependence, including reduced psychiatric hospitalizations, emergency department visits, and improved adherence to psychiatric medications.

CHAPTER 4: DISCUSSION AND IMPLICATIONS

Medication adherence is a complex process that is influenced by multiple variables, including socio-cultural factors, setting and environment, illness type, treatment, provider qualities, and individual characteristics. This rapid scoping review identified the prevalence of psychotropic medication adherence, methods of measurement, influencing factors, and strategies and interventions that enhance medication adherence for the forensic population in institutional and community settings. Although the sample of studies is relatively small, this review discusses the findings, challenges, and contradictions in the research thus far. However, there are inherent challenges making comparisons across countries about medication prevalence and potential monitoring practices. This is due to socio-cultural differences in the mental health and criminal justice systems of these countries that may not be readily apparent in these studies. Further, due to the wide variance in definition and measurement of adherence, more research is needed to reproduce and affirm study findings.

Eleven articles met inclusion criteria for this review; two of those articles, one focusing on quantitative results and the other on qualitative, originated from one mixed methods study with the same prison population sample (Gray et al., 2008; Mills et al., 2011). They represented the prison, forensic psychiatric hospital, parolee, and probation populations in the United States, United Kingdom, Australia, Japan, and Korea who had one or more mental disorders and were prescribed psychotropic medication. Unfortunately, no studies on jail inmates met inclusion criteria. Almost three quarters of the studies meeting inclusion criteria were published in the last 10 years, suggesting a trending interest in this topic. A great majority were quantitative studies, and more than half of the studies originated in the United States. Additionally, the bulk of the study populations were mixed gender with one study focusing on female inmates only and

another not reporting gender at all. The majority of researchers had a psychology background, followed by psychiatry, social work, and nursing. Most of the studies examined psychosocial issues or interventions on the research topic with the exception of one study that validated a urine analysis methodology specifically for probationers (Kim et al., 2020). A discussion of the four research questions of this rapid scoping review follows.

Prevalence

The prevalence of psychotropic medication adherence for individuals with mental illness in the community ranges by condition, medication type, and setting. The literature cites a range of 44% to 90% non-adherence depending on the definition, measurement strategy, and patient population (Velligan et al., 2017; Khalifah & Hamdan-Mansour, 2021; Semahegn et al., 2021).

In this rapid scoping review, high levels of adherence were found with forensic populations in institutional settings. The overall prevalence for individuals in prisons or forensic psychiatric hospitals ranged from “passive acceptance” and “largely adherent” according to the Clinical Rating Scale and qualitative interviews, respectively, to 79% and 92% according to urine analysis and pill count computations. This was not entirely unexpected as Mills et al. (2011) suggested that institutional structure and routine may have a positive effect on medication adherence. The results from the study by Farabee et al. (2004) also reported that the presence of a guardian (in institutional settings, this could be the correctional officers, nursing staff, and/or clinicians) had a positive impact on medication adherence. Additionally, tentative findings from Herrera et al. (2020) suggested that perceived support from treatment team members may have a positive impact on medication adherence.

For study populations in the community, such as parolees and probationers, the range of medication prevalence was less impressive. Calhoun (2018) reported that 71% of parolees in that

study met criteria for “low adherence” at the follow up assessment. The findings from the study by Robertson et al. (2018) suggested that MAT was correlated with improved psychotropic medication adherence. More specifically, the odds of having a good medication possession ratio were better in the post-treatment MAT group than in the comparison group (odds ratio=1.57, 95% CI=1.28-1.93). Unlike a percentage rate, this value was more complicated to interpret because the medication possession ratio was used as a proxy for medication adherence, which being based on self-report was already an unreliable measure. Finally, the study by Kim et al. (2020) reported a high rate of positive urine test results for probationers in South Korea subject to mandatory medication compliance monitoring. This study found that 83.4% of the 242 urine samples tested positive for targeted chemical compounds that indicated the ingestion of antipsychotics. While these results are encouraging, it is a dichotomous finding that does not address the degree of adherence, only that chemical compounds were detected.

Medication Adherence Measures

As in community settings with non-forensic populations, medication adherence for the forensic population is typically measured by direct (e.g., observation and urine analysis) and indirect (e.g., self-report and pill count) means (Hess et al., 2006; Farooq & Naeem, 2014; Brown et al., 2016). Using these means, the prevalence or rate of adherence varied across studies and by differences in measurement which made comparisons difficult. For example, measurements from urinalysis, while objective, were dichotomous, and while metabolites indicated the ingestion of an antipsychotic, they are typically unable to specify the degree of adherence. In contrast, a clinical measurement tool such as the Clinical Rating Scale (CRS) or the Morisky Medication Adherence Scale (MMAS-8), relied on self-report or provider observation in which adherence was assessed using a scale which is a slightly more meaningful

clinical measure. Other common methods of measurement were pill counts or similar calculation to quantify a patient's degree of medication adherence. While seemingly objective, this type of adherence measurement can be easily defeated or manipulated in institutional settings by deliberate medication diversion, "cheeking," or other deceptive tactics. Additionally, Robertson et al. (2018) used a self-report medication possession ratio which was a dichotomous indicator of whether the medication possession ratio was at least 80% in a given month.

Issues of measurement aside, the results of this rapid scoping review further demonstrate that there is no standard definition of adherence or even agreement across studies as to what constitutes adherence. Similar to non-forensic settings, there are likely significant resource limitations and certain practice realities with forensic populations that contribute to the challenge of measuring medication adherence. For example, most institutional settings use medication administration records or pill counts in conjunction with direct observation to determine adherence. This type of data is not available when the offender is in a community environment where self-administration is the standard practice. Most researchers in this area of study likely recognize these limitations and work with the resources available, which may result in disparate data across settings. In any event, this issue merits further attention as establishing a standard definition and a practice, or range of practices, of measuring medication adherence would allow meaningful comparisons to be made across research studies.

Influencing Factors

In this rapid scoping review, a review of factors that influenced medication adherence yielded mixed results. Some of the factors yielding mixed results included the influence of perceived coercion and therapeutic working alliance (inclusive of provider empathy and

communication). Other factors, such as age and substance use, had more noticeable impact on medication adherence.

There are numerous studies that discuss the prevalence and impact of coercion in mental health treatment (O'Brien et al., 2003; Salize & Dressing, 2005; Dunn et al., 2012; Szmukler, 2015). Further, a meta-analysis on the effectiveness of coercion in offender treatment found that mandated treatment is ineffective, particularly in correctional settings, when compared to voluntary treatment regardless of setting (Parhar et al., 2008). Other literature, however, suggests that coercion has both positive and negative effects on treatment participation and outcomes (Hachtel et al., 2019). Interestingly, several studies in this rapid scoping review suggested that perceived coercion had little to no impact on medication adherence (Farabee, et al., 2004; Gray et al., 2008; Mills et al., 2011). Given the rise in mandated treatment and programs for offenders, the impact of coercion on treatment adherence necessitates continued focus and study.

Also unexpected was the Calhoun (2018) finding that patient-clinician working alliance had no impact on medication adherence. This appeared to be contradicted by other studies in this review that suggested medication adherence was positively associated with treatment team support (Murasugi et al., 2015; Herrera, 2020) and with provider empathy and communication (Mills et al., 2011). Other findings—that young age (Baillargeon et al., 2000; Farabee et al., 2004) and substance use (Calhoun, 2018; Robertson et al., 2018) were negatively associated with medication adherence—were consistent with the literature on medication adherence with non-forensic populations in the community (Kane et al., 2013; Velligan et al., 2017; Semahegn et al., 2020).

Similar to adherence prevalence and measures, factors affecting adherence with the forensic population in all settings merits further study, particularly in light of the inconsistency in

some of the findings. More qualitative research in this area, similar to the study by Mills et al. (2013), may be helpful in better understanding the context and nuance surrounding these influencing factors.

Strategies and Interventions

This rapid scoping review identified several interventions with the potential to improve medication adherence. These interventions included a comprehensive medication adherence program (Cavezza et al., 2013), the Medication Discontinuation Program (Murasugi et al., 2015), and a medication algorithm (Ehret et al., 2013). The study by Robertson et al. (2018) on the impact of medication assisted treatment for alcohol use is another intervention with positive effects on medication adherence.

Other strategies found to be potentially helpful were social support (either through the treatment team or a guardian), type of medication, conveyance of positive provider qualities like empathy and active listening, increasing the personal relevance of the medication, and the use of certain therapeutic modalities like Cognitive Behavioral Treatment (DBT) and Motivational Interviewing (MI) which is consistent with the literature on medication adherence strategies for non-forensic populations. Although not a strategy, the structure and routine of the prison environment was seen as both beneficial and problematic to medication adherence. Although these findings overall are encouraging, more research is needed to fully evaluate the impact of these strategies with a larger sample of forensic populations.

Limitations

The following limitations should be noted. First, this was a rapid scoping review with a limited scope and timeframe for completion. Second, the inclusion criteria confined the scope and range of the study resulting in a small sample of included studies that may not be

representative of the current research. Third, although personality disorders were included only if they did not exceed 25% of the study population, they are overrepresented in institutional settings and should be prioritized for inclusion in future studies. Fourth, studies with jail and probation populations were underrepresented in this review. For jail populations in particular, it is likely difficult to reliably identify participants who will remain in custody for the necessary timeframe in which to conduct a study. However, it is not clear why probationers are not more represented in this type of research. Next, programs like Assisted Outpatient Treatment (AOT) likely include a forensic sub-population, most likely those on probation, but were not captured by this particular research focus. Thus, further review of AOT research studies that include the forensic population is recommended and could, perhaps, inform medication adherence practices with an exclusively forensic population. Finally, while screening involved an independent search process, data extraction was performed by one researcher only.

Implications for Future Research and Practice

This rapid scoping review has important implications for practitioners, administrators, policy makers, and researchers. The forensic population in correctional and community settings frequently present with complex treatment and psychosocial needs. These needs often require resource-intensive services which may put an undue burden on an already highly taxed system of care serving a population with intensive supervision and treatment requirements. Utilizing effective medication adherence strategies with the forensic population can help reduce the strain on the system of care, improve treatment outcomes, as well as enhance quality of life for offenders receiving care. Thus, more research on all aspects of medication adherence with the forensic population is imperative.

The range in definition and measurement of medication adherence in the included studies speaks to the need for standardized definitions and measurements for medication adherence. This is essential in making meaningful comparisons across studies and for future systematic reviews on this topic.

The lack of qualitative studies identified in this rapid scoping review was notable. Qualitative experiences are a necessary complement to quantitative findings as they allow personal experiences of medication and the impact of incarceration or other criminal justice involvement to be explored. Qualitative studies also allow for a more contextual analysis of the conditions in which medication adherence occurs, as well as the impact that other factors—like gender, incarceration, type of medication, coercion, substance use, prior treatment experiences, and so on—have on adherence. Although the results may not be generalizable, these subjective experiences can still offer much needed insight that could inform future research.

There is an additional need to study more cutting-edge approaches similar to the Medication Discontinuation Program in Japan in which medication is stopped and reintroduced with psychoeducation, crisis planning, and patient-centered decision making within a therapeutic hospital setting. Given the small sample size of this original study by Murasugi et al. (2015), research with a larger sample size of forensic patients in a similar institutional setting is recommended.

More research on the adaptation of evidence-based interventions such as medication algorithms, motivational interviewing, and cognitive behavioral therapy in forensic settings is greatly needed. While there are evidence-based practices that address treatment compliance, most are based on research with non-offending populations often in traditional outpatient, hospital, or home settings and have not been tested with justice-involved populations (Spoelstra

et al., 2015; Macinnes & Masino, 2019). These practices must often be modified for use in correctional settings as demonstrated in the study by Ehret et al. (2013), but further study of such modifications could potentially improve adherence in such facilities.

More medication adherence research on jail and probation populations with serious mental illness is needed. It is unclear if the lack of studies on jail inmates and probationers in this review is representative of the *status quo* and, if so, more research with these populations is clearly indicated. Increased research is particularly warranted on the quality and degree of medication adherence of individuals transitioning from institutional to community settings. This transition often results in diminishing adherence, especially for those individuals leaving the structured setting of institutional care and returning to chaotic lifestyles, homelessness, inadequate support systems, and/or active substance use.

With respect to practice implications, clinicians and providers who work with offenders in community-based treatment programs and behavioral health treatment courts are often witnesses to the negative impact of substance use on medication adherence. Although primary substance use disorders were an exclusion criteria in this rapid scoping review, studies that included substance use as a co-morbidity with serious mental illness were included. It is undeniable that more strategies to address substance use with the forensic population will likely improve medication adherence rates for substance using offenders with mental illness. As such, it would behoove community- and court-based programs to integrate substance abuse treatment and medication adherence strategies into their service delivery platforms.

Additionally, adherence concepts, strategies, and interventions should be a part of organizational training with all disciplines in forensic settings. Jails and prisons, in particular, rely on a multidisciplinary staff for medical and mental health services and correctional

supervision. In addition, person-centered treatment engagement should start at the first point of contact, using individual factors and strategies to enhance rapport building and treatment adherence. Although the findings of this review were mixed regarding the influence of positive social support, empathy, and communication on medication adherence, it is also important that all staff understand the issues related to medication adherence so that individualized and person-centered approaches that support patient autonomy and self-determination become second nature to the treatment team, inclusive of correctional staff.

Finally, and most importantly, the need for further study on the impact of coercion on medication adherence with the forensic population is essential. Offenders with serious mental illness are a marginalized demographic that is often subject to intrusive, intensive, and, in some instances, coercive treatment (including the administration of involuntary medication). The need to identify and implement more person-centered strategies that support self-determination, while encouraging medication and treatment, is critical and may result in enhanced and enduring treatment outcomes.

Conclusion

This rapid scoping review sought to systematically review the research on adherence prevalence, measurement, influencing factors, and strategies with forensic populations who have mental illness in institutional and community settings. The study findings were varied and, at times, conflicting, but some aspects (for example, the use of medication adherence strategies such as urine testing and motivational interviewing) appeared to be similar to non-forensic populations in community settings. The added element of institutional setting was a defining difference between the institutional and community populations, especially as the structure and routine of the prison setting appears to enhance, in some ways, medication adherence. It is

unfortunate that studies with the jail population did not meet inclusion criteria for this review, as this could have added another dimension to the findings. Furthermore, due to the small sample size of this scoping review, the findings are not generalizable to the forensic population as a whole, but may be used as a starting point for future research.

Overall, this review highlights the need for more standardized adherence definitions and measurement practices, more focus on studies with jail and probation populations, and the need for more qualitative research approaches. With respect to practice strategies and interventions, it revealed the need for more evidence-based practices and person-centered approaches with the forensic population. Moreover, with no studies that explicitly discussed adherence rates related to the transition from institutional care to the community, this review underscores the necessity for research focused on this topic, especially with the increasing policy of decarceration. In addition, with legally sanctioned involuntary medication practices in correctional settings and increased implementation of programs that mandate treatment, such as AOT, that serve a forensic sub-population, the impact and influence of coercion on medication adherence with this population deserves closer attention and study. Finally, with growing numbers of individuals with serious mental illness entering, residing in, and exiting the criminal justice system—and increased public and political interest in this population—understanding psychotropic medication adherence and its associated factors is essential in developing appropriate treatment interventions and affirming effective practices for this special population.

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APPENDICES

Appendix A

PubMed

Search number	Query	Filters	Search Details	Results
4	#1 AND #2 AND #3	from 1990/1/1 - 2021/12/31	((("offender*[Text Word] OR "incarcerat*[Text Word] OR "criminal*[Text Word] OR "defendant*[Text Word] OR "jail"[Text Word] OR "secure facility"[Text Word] OR "penal"[Text Word] OR "penitentiary"[Text Word] OR "probation*[Text Word] OR "parole*[Text Word] OR "felon*[Text Word] OR "misdemean*[Text Word] OR "inmate*[Text Word] OR "remand"[Text Word] OR "convict*[Text Word] OR "conditional release"[Text Word] OR "forensic assertive community treatment"[Text Word] OR "jail diversion"[Text Word] OR "competency restoration"[Text Word] OR "pretrial"[Text Word] OR "detainee"[Text Word] OR "justice-involved"[Text Word] OR "pretrial diversion"[Text Word] OR "diversion"[Text Word] OR ("Forensic Psychiatry"[MeSH Terms] OR "Forensic Psychology"[MeSH Terms] OR "Forensic Nursing"[MeSH Terms] OR "Correctional Facilities"[MeSH Terms] OR "Criminal Law"[MeSH Terms] OR "Criminals"[MeSH Terms] OR "Criminal Psychology"[MeSH Terms] OR "Criminal Behavior"[MeSH Terms] OR "hospitals, state"[MeSH Terms] OR "Prisons"[MeSH Terms] OR "Prisoners"[MeSH Terms])) AND 1990/01/01:2021/12/31[Date - Publication] AND ("psychoactive"[Text Word] OR	332

			"antipsychotic"[Text Word] OR "pharmacological"[Text Word] OR "long acting injecti*"[Text Word] OR "mood stabilizer"[Text Word] OR "antidepressant"[Text Word] OR "neuroleptic"[Text Word] OR ("Psychotropic Drugs"[MeSH Terms] OR "Psychotropic Drugs"[Pharmacological Action] OR "Psychopharmacology"[MeSH Terms])) AND 1990/01/01:2021/12/31[Date - Publication]) AND (("involuntary medication"[Text Word] OR "forced medication"[Text Word] OR "mandated treatment"[Text Word] OR ("Treatment Adherence and Compliance"[MeSH Terms] OR "Medication Adherence"[MeSH Terms] OR "Patient Compliance"[MeSH Terms])) AND 1990/01/01:2021/12/31[Date - Publication])) AND (1990/1/1:2021/12/31[pdat])	
3	("involuntary medication" [tw] OR "forced medication" [tw] OR "mandated treatment" [tw]) OR ("Treatment Adherence and Compliance"[Mes h] OR "Medication Adherence"[Mesh] OR "Patient Compliance"[Mes h])	from 1990/1/1 - 2021/12/31	("involuntary medication"[Text Word] OR "forced medication"[Text Word] OR "mandated treatment"[Text Word] OR "Treatment Adherence and Compliance"[MeSH Terms] OR "Medication Adherence"[MeSH Terms] OR "Patient Compliance"[MeSH Terms]) AND (1990/1/1:2021/12/31[pdat])	249,659
2	(psychoactive [tw] OR antipsychotic [tw] OR pharmacological [tw] OR "long acting injecti*" [tw] OR "mood stabilizer" [tw] OR	from 1990/1/1 - 2021/12/31	("psychoactive"[Text Word] OR "antipsychotic"[Text Word] OR "pharmacological"[Text Word] OR "long acting injecti*"[Text Word] OR "mood stabilizer"[Text Word] OR "antidepressant"[Text Word] OR "neuroleptic"[Text Word] OR "Psychotropic Drugs"[MeSH Terms]	498,139

	"antidepressant" [tw] OR "neuroleptic" [tw]) OR ("Psychotropic Drugs"[Mesh] OR "Psychotropic Drugs" [Pharmacological Action] OR "Psychopharmacol ogy"[Mesh])		OR "Psychotropic Drugs"[Pharmacological Action] OR "Psychopharmacology"[MeSH Terms]) AND (1990/1/1:2021/12/31[pdat])	
1	(offender*[tw] OR incarcerat* [tw] OR criminal* [tw] OR defendant* [tw] OR jail [tw] OR "secure facility" [tw] OR penal [tw] OR penitentiary[tw] OR probation* [tw] OR parole* [tw] OR felon* [tw] OR misdemean* [tw] OR inmate* [tw] OR remand [tw] OR convict* [tw] OR "conditional release" [tw] OR "forensic assertive community treatment" [tw] OR "jail diversion" [tw] OR "competency restoration" [tw] OR "pretrial" [tw] OR "detainee" [tw] OR "justice- involved" [tw] OR "pretrial diversion" [tw] OR "diversion" [tw]) OR ("Forensic Psychiatry"[Mesh]	from 1990/1/1 - 2021/12/31	("offender*[Text Word] OR "incarcerat*[Text Word] OR "criminal*[Text Word] OR "defendant*[Text Word] OR "jail"[Text Word] OR "secure facility"[Text Word] OR "penal"[Text Word] OR "penitentiary"[Text Word] OR "probation*[Text Word] OR "parole*[Text Word] OR "felon*[Text Word] OR "misdemean*[Text Word] OR "inmate*[Text Word] OR "remand"[Text Word] OR "convict*[Text Word] OR "conditional release"[Text Word] OR "forensic assertive community treatment"[Text Word] OR "jail diversion"[Text Word] OR "competency restoration"[Text Word] OR "pretrial"[Text Word] OR "detainee"[Text Word] OR "justice- involved"[Text Word] OR "pretrial diversion"[Text Word] OR "diversion"[Text Word] OR "Forensic Psychiatry"[MeSH Terms] OR "Forensic Psychology"[MeSH Terms] OR "Forensic Nursing"[MeSH Terms] OR "Correctional Facilities"[MeSH Terms] OR "Criminal Law"[MeSH Terms] OR "Criminals"[MeSH Terms] OR "Criminal Psychology"[MeSH Terms] OR "Criminal Behavior"[MeSH Terms]	110,287

	OR "Forensic Psychology"[Mesh]] OR "Forensic Nursing"[Mesh] OR "Correctional Facilities"[Mesh] OR "Criminal Law"[Mesh] OR "Criminals"[Mesh] OR "Criminal Psychology"[Mesh]] OR "Criminal Behavior"[Mesh] OR "Hospitals, State"[Mesh] OR "Prisons"[Mesh] OR "Prisoners"[Mesh])		OR "hospitals, state"[MeSH Terms] OR "Prisons"[MeSH Terms] OR "Prisoners"[MeSH Terms]) AND (1990/1/1:2021/12/31[pdat])	
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PsycINFO

Searched for:

(prison* OR forensic OR offender* OR inmate OR incarcerat* OR criminal* OR defendant* OR jail OR "secure facility" OR "state hospital" OR penal OR penitentiary OR "correctional facility" OR "correctional institution" OR probation* OR parole* OR felon* OR misdemean* OR remand OR convict* OR "conditional release" OR "forensic assertive community treatment" OR "jail diversion" OR "competency restoration" OR "pretrial" OR "detainee" OR "justice-involved" OR "pretrial diversion" OR "diversion" OR "criminal justice") AND ("psychotropic medication" OR psychoactive OR antipsychotic OR pharmacological OR "long acting injecti*" OR "mood stabilizer*" OR "antidepressant" OR "neuroleptic") AND ("treatment adherence" OR "treatment compliance" OR "medication adherence" OR "medication compliance" OR "patient compliance" OR "involuntary medication" OR "forced medication" OR "mandated treatment" OR adheren* OR complian* OR "non-complian*" OR "non-adheren*") AND la.exact("English") AND age.exact("Adulthood (18 Yrs & Older)") AND pd(19900101-20211231)

Limited by:

Date: From January 011990 to December 312021

Language:

English

Age group:

Adulthood (18 Yrs & Older)

Databases: APA PsycInfo®

ProQuest Dissertations & Theses Global

Searched for:

ab(prison* OR forensic OR offender* OR inmate OR incarcerat* OR criminal* OR defendant*
OR jail OR "secure facility" OR "state hospital" OR penal OR penitentiary OR "correctional
facility" OR "correctional institution" OR probation* OR parole* OR felon* OR misdemean*
OR remand OR convict* OR "conditional release" OR "forensic assertive community treatment"
OR "jail diversion" OR "competency restoration" OR "pretrial" OR "detainee" OR "justice-
involved" OR "pretrial diversion" OR "diversion" OR "criminal justice") AND ("psychotropic
medication" OR psychoactive OR antipsychotic OR pharmacological OR "long acting injecti*"
OR "mood stabilizer*" OR "antidepressant" OR "neuroleptic") AND ab("treatment adherence"
OR "treatment compliance" OR "medication adherence" OR "medication compliance" OR
"patient compliance" OR "involuntary medication" OR "forced medication" OR "mandated
treatment" OR adheren* OR complian* OR "non-complian*" OR "non-adheren*") AND
la.exact("English") AND pd(19900101-20211105) AND pd(19900101-20211231)

Limited by:

Date: From January 011990 to December 312021

Language: English

Databases: Dissertations & Theses @ University of Pennsylvania

ProQuest Dissertations & Theses Global

Criminal Justice Abstracts with Full Text

(prison* OR forensic OR offender* OR inmate OR incarcerat* OR criminal* OR defendant* OR jail OR "secure facility" OR "state hospital" OR penal OR penitentiary OR "correctional facility" OR "correctional institution" OR probation* OR parole* OR felon* OR misdemeanor* OR remand OR convict* OR "conditional release" OR "forensic assertive community treatment" OR "jail diversion" OR "competency restoration" OR "pretrial" OR "detainee" OR "justice-involved" OR "pretrial diversion" OR "diversion" OR "criminal justice")

AND

("psychotropic medication" OR psychoactive OR antipsychotic OR pharmacological OR "long acting injecti*" OR "mood stabilizer*" OR "antidepressant" OR "neuroleptic")

AND

("treatment adherence" OR "treatment compliance" OR "medication adherence" OR "medication compliance" OR "patient compliance" OR "involuntary medication" OR "forced medication" OR "mandated treatment" OR adheren* OR complian* OR "non-compliant*" OR "non-adheren*")

[https://proxy.library.upenn.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=i3h&bquery=\(+prison*+OR+forensic+OR+offender*+OR+inmate+OR+incarcerat*+OR+criminal*+OR+defendant*+OR+jail+OR+%E2%80%9Csecure+facility%E2%80%9D+OR+%E2%80%9Cstate+hospital%E2%80%9D+OR+penal+OR+penitentiary+OR+%E2%80%9Ccorrectional+facility%E2%80%9D+OR+%E2%80%9Ccorrectional+institution%E2%80%9D+OR+probation*+OR+parole*+OR+felon*+OR+misdemean*+OR+remand+OR+convict*+OR+%E2%80%9Cconditional+release%E2%80%9D+OR+%E2%80%9Cforensic+assertive+community+treatment%E2%80%9D+OR+%E2%80%9Cjail+diversion%E2%80%9D+OR+%E2%80%9Ccompetency+restoration%E2%80%9D+OR+%E2%80%9Cpretrial%E2%80%9D+OR+%E2%80%9Cdetainee%E2%80%9D+OR+%E2%80%9Cjustice-involved%E2%80%9D+OR+%E2%80%9Cpretrial+diversion%E2%80%9D+OR+%E2%80%9Ccriminal+justice%E2%80%9D+\)+AND+\(+%26quot%3bpsychotropic+medication%26quot%3b+OR+psychoactive+OR+antipsychotic+OR+pharmacological+OR+%26quot%3blong+acting+injecti*%26quot%3b+OR+%26quot%3bmood+stabilizer*%26quot%3b+OR+%26quot%3bantidepressant%26quot%3b+OR+%26quot%3bneuroleptic%26quot%3b+\)+AND+\(+%E2%80%9Ctreatment+adherence%E2%80%9D+OR+%E2%80%9Ctreatment+compliance%E2%80%9D+OR+%E2%80%9Cmedication+adherence%E2%80%9D+OR+%E2%80%9Cmedication+compliance%E2%80%9D+OR+%E2%80%9Cpatient+compliance%E2%80%9D+OR+%E2%80%9Cinvoluntary+medication%E2%80%9D+OR+%E2%80%9Cforced+medication%E2%80%9D+OR+%E2%80%9Cmandated+treatment%E2%80%9D+OR+adheren*+OR+complian*+OR+%26quot%3bnon-compliant*%26quot%3b+OR+%26quot%3bnon-adheren*%26quot%3b+\)&cli0=DT1&clv0=199001-202112&cli1=LA99&clv1=eng&type=1&searchMode=And&site=ehost-live&ssl=y](https://proxy.library.upenn.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=i3h&bquery=(+prison*+OR+forensic+OR+offender*+OR+inmate+OR+incarcerat*+OR+criminal*+OR+defendant*+OR+jail+OR+%E2%80%9Csecure+facility%E2%80%9D+OR+%E2%80%9Cstate+hospital%E2%80%9D+OR+penal+OR+penitentiary+OR+%E2%80%9Ccorrectional+facility%E2%80%9D+OR+%E2%80%9Ccorrectional+institution%E2%80%9D+OR+probation*+OR+parole*+OR+felon*+OR+misdemean*+OR+remand+OR+convict*+OR+%E2%80%9Cconditional+release%E2%80%9D+OR+%E2%80%9Cforensic+assertive+community+treatment%E2%80%9D+OR+%E2%80%9Cjail+diversion%E2%80%9D+OR+%E2%80%9Ccompetency+restoration%E2%80%9D+OR+%E2%80%9Cpretrial%E2%80%9D+OR+%E2%80%9Cdetainee%E2%80%9D+OR+%E2%80%9Cjustice-involved%E2%80%9D+OR+%E2%80%9Cpretrial+diversion%E2%80%9D+OR+%E2%80%9Ccriminal+justice%E2%80%9D+)+AND+(+%26quot%3bpsychotropic+medication%26quot%3b+OR+psychoactive+OR+antipsychotic+OR+pharmacological+OR+%26quot%3blong+acting+injecti*%26quot%3b+OR+%26quot%3bmood+stabilizer*%26quot%3b+OR+%26quot%3bantidepressant%26quot%3b+OR+%26quot%3bneuroleptic%26quot%3b+)+AND+(+%E2%80%9Ctreatment+adherence%E2%80%9D+OR+%E2%80%9Ctreatment+compliance%E2%80%9D+OR+%E2%80%9Cmedication+adherence%E2%80%9D+OR+%E2%80%9Cmedication+compliance%E2%80%9D+OR+%E2%80%9Cpatient+compliance%E2%80%9D+OR+%E2%80%9Cinvoluntary+medication%E2%80%9D+OR+%E2%80%9Cforced+medication%E2%80%9D+OR+%E2%80%9Cmandated+treatment%E2%80%9D+OR+adheren*+OR+complian*+OR+%26quot%3bnon-compliant*%26quot%3b+OR+%26quot%3bnon-adheren*%26quot%3b+)&cli0=DT1&clv0=199001-202112&cli1=LA99&clv1=eng&type=1&searchMode=And&site=ehost-live&ssl=y)

Database	Limiters Applied
Criminal Justice Abstracts with Full Text	Publication Date: 19900101-20211231; Language: English