
MOTIVATIONAL INTERVIEWING AND MOTIVATIONAL ENHANCEMENT THERAPY FOR THE TREATMENT OF OPIOID USE DISORDERS

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OHIO SUBSTANCE USE DISORDER
CENTER OF EXCELLENCE

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Executive Summary

Background

Opioid use disorders (OUDs) pose a significant public health challenge in the United States, with rising rates of opioid misuse, addiction, and overdose deaths in recent years. Initially developed for addressing drinking problems in 1983, motivational interviewing (MI) has since been expanded for the treatment of substance use disorders (SUDs) and other chronic conditions. Motivational Enhancement Therapy (MET) is a four-session manualized version of the core components of MI that was developed in 1993 as part of a large-scale alcohol use disorder study known as Project MATCH. Both MI and MET are well-established therapeutic approaches that aim to enhance motivation for change and improve treatment outcomes among individuals with SUDs. This report reviews the literature on the effectiveness of MI and MET for addressing OUDs.

Methods

A comprehensive literature search was conducted using multiple databases to identify studies that investigated the effectiveness of MI and MET for individuals with OUD or opioid misuse. To be included in the review, studies had to: (1) use an experimental design, where participants were randomly assigned to one of the treatment groups, (2) include primary data, (3) have samples that predominantly consisted of individuals with OUD or opioid misuse, and (4) examine drug use or mortality outcomes. The majority of the reviewed studies directly examined the effectiveness of MI or MET and compared them to control conditions. However, there were also some studies where MI or MET was part of a blended intervention; these studies were summarized separately. The main outcomes of interest were opioid use, treatment retention, and mortality/morbidity.

Findings

The search yielded 16 relevant experimental studies that met the inclusion criteria. Eleven studies evaluated MI, whereas five studies evaluated blended interventions where MI or MET was part of the intervention. The reviewed studies provided mixed but generally supportive evidence for the effectiveness of MI/MET and blended interventions in treating OUDs. Several studies found that MI/MET led to significant reductions in opioid use, improved treatment retention, and decreased overdose risk behaviors compared to control conditions. However, some studies found no significant differences between MI/MET and comparison groups on these outcomes. Similarly, only a few of the blended interventions found promising outcomes. Most of the MI/MET and blended interventions were monitored for fidelity to ensure adherence to the intervention protocols. The heterogeneity across studies in terms of intervention characteristics, populations, and outcome measures made it challenging to draw definitive conclusions.

Conclusion

Despite the limitations of the existing research, MI/MET appears to be a feasible and potentially effective approach for addressing OUDs. Motivational interviewing and motivational enhancement therapy may enhance motivation, treatment engagement, and improve drug use outcomes when incorporated into treatment. However, more high-quality research with rigorous designs, objective outcome measures, and adequate sample sizes is needed to establish the efficacy of MI/MET for this population. Future studies should continue to examine the unique or additive effects of MI/MET on the treatment of OUDs.

Opioid Use Disorder Trends in the U.S. and Ohio

Substance misuse poses a significant challenge in the United States, with opioids being linked with the highest rates of overdose deaths (Ahmad et al., 2024). The term “opioids” refers to a class of drugs including prescription pain medications with addiction potential, such as oxycodone and morphine, as well as pharmaceutical fentanyl, illegally made fentanyl, and the illegal drug heroin (Centers for Disease Control and Prevention [CDC], 2024a). As a strong synthetic opioid, pharmaceutical fentanyl is usually prescribed for advanced stage cancer patients and severe pain (CDC, 2024b). Illegally made fentanyl is attained through the drug market and has been a major contributor to overdose death rates in recent years (CDC, 2024b; Ahmad et al., 2024). While prescription opioids can help manage pain effectively, it is important for patients to take them only as prescribed by a doctor to minimize the risk of developing serious side effects or an addiction (American Association of Anesthesiologists, 2024). Opioid use disorder (OUD) is a condition characterized by compulsive and prolonged misuse of illicit or prescription opioids, diagnosed when an individual exhibits at least two of several criteria within a 12-month period, including loss of control over use, cravings, persistent social or occupational problems, and continued use despite negative physical or psychological consequences (American Psychiatric Association, 2022).

The Centers for Disease Control and Prevention’s National Vital Statistics System provides reported and provisional drug overdose death estimates for every month from January 2015 through the present (Ahmad et al., 2024). Estimates represent the count of deaths that occurred over the last 12 months since the month of the estimate. Data are available at the national and state levels for several drug classes. Figures 1 and 2 show trends in drug overdose deaths connected to opioid use in the US and Ohio between 2015 and 2023 where data are

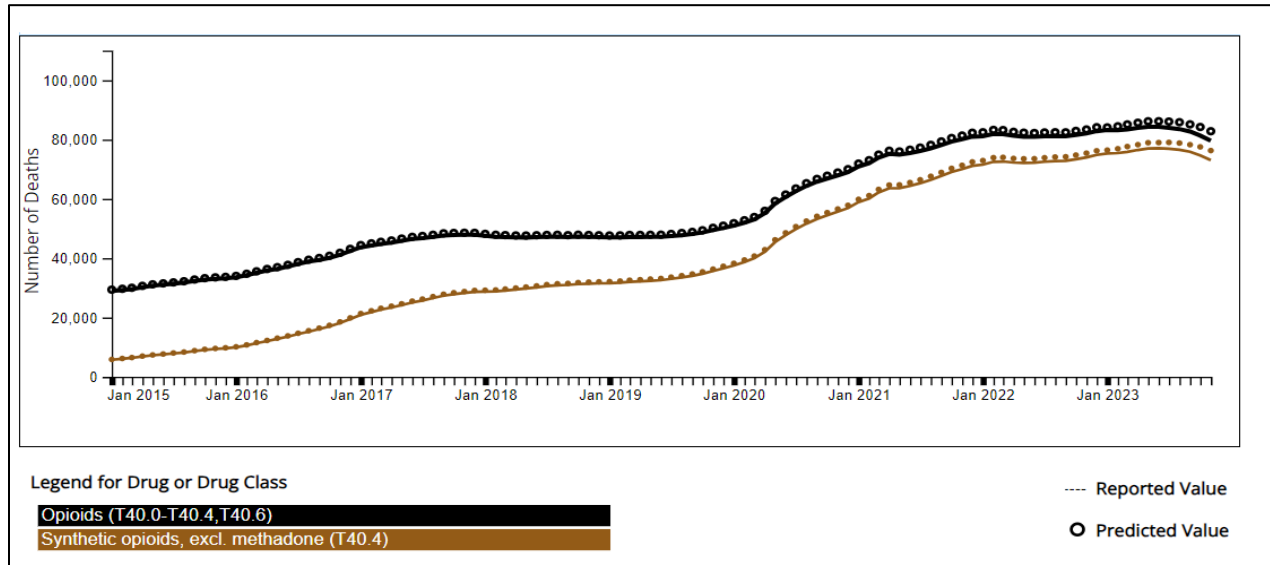
available. The reported number of deaths from opioids increased between January 2015 and November 2023 in the U.S and Ohio. The reported number of deaths from opioids¹ in the U.S. increased nearly threefold, from 28,986 in January 2015 to 79,642 in November 2023. For Ohio, overdose deaths due to opioids increased from 2,335 in April 2015 to 3,898 in November 2023, representing about a 1.67-fold increase (Ahmad et al., 2024). According to the Ohio Department of Health, in 2022, fentanyl or its analogs were involved in 81% of unintentional drug overdose deaths and 96% of opioid-related overdose deaths in the state.²

¹ “Opioid overdose deaths are identified by the presence of any of the following multiple cause-of-death codes: opium (T40.0); heroin (T40.1); natural opioid analgesics (T40.2); methadone (T40.3); synthetic opioid analgesics other than methadone (T40.4); or other and unspecified narcotics (T40.6)” (Ahmad et al., 2024).

² For more detailed information on drug overdose deaths for the state of Ohio, see the Ohio Department of Health’s 2022 Unintentional Drug Overdose Report: <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/violence-injury-prevention-program/media/2022-ohio-drug-overdose-report>.

Figure 1

Provisional Number of Drug Overdose Deaths by Drug or Drug Class: United States³

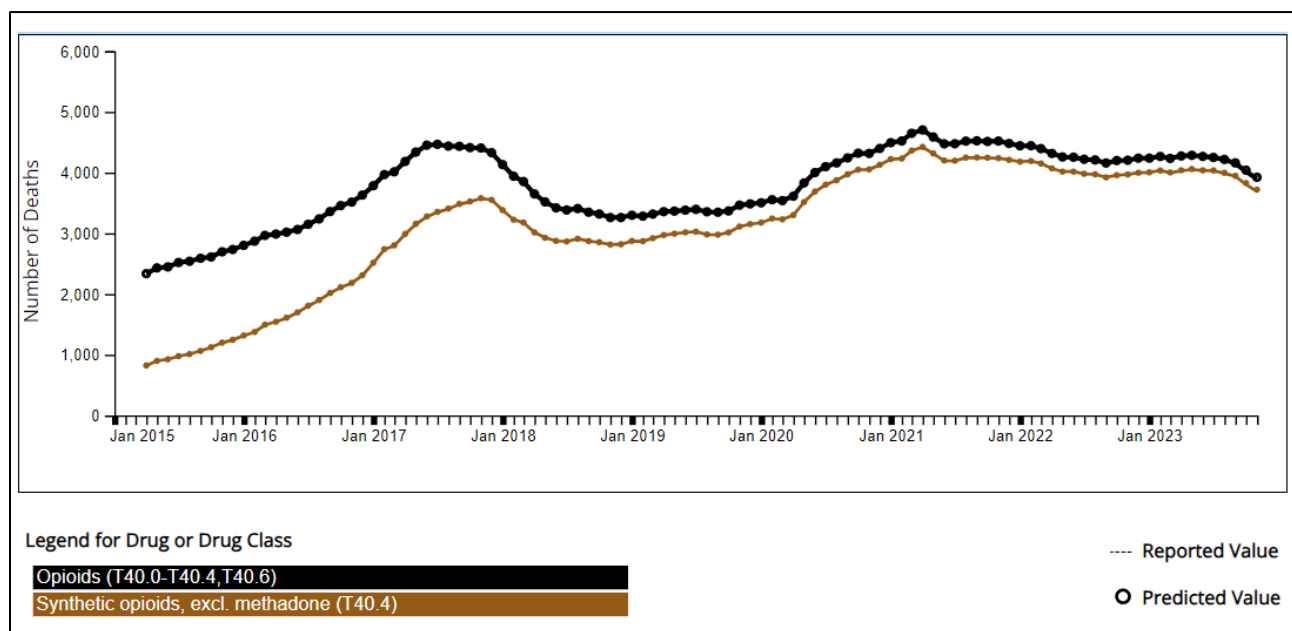


Source: Ahmad, F. B., Cisewski, J. A., Rossen, L. M., and Sutton, P. (2024). *Provisional drug overdose death counts*. National Center for Health Statistics.

³ Ahmad et al. (2024) noted: “Reported provisional counts for 12-month ending periods are the number of deaths received and processed for the 12-month period ending in the month indicated. Provisional counts may not include all deaths that occurred during a given time period. Therefore, they should not be considered comparable with final data and are subject to change. Predicted provisional counts represent estimates of the number of deaths adjusted for incomplete reporting...Drug overdose deaths involving selected drug categories are identified by the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD–10) multiple cause-of-death codes.” See <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm> for more information.

Figure 2

Provisional Number of Drug Overdose Deaths by Drug or Drug Class: Ohio¹



Source: Ahmad, F. B., Cisewski, J. A., Rossen, L. M., and Sutton, P. (2024). *Provisional drug overdose death counts*. National Center for Health Statistics.

According to the 2022 National Survey on Drug Use and Health (NSDUH), 6.1 million people (2.2%) over the age of 12 in the U.S. had an OUD, such as heroin use disorder or prescription pain reliever use disorder (Substance Abuse and Mental Health Services Administration [SAMHSA], 2023). In 2021, 3.3% of people over the age of 12 in the U.S. and 3.7% in Ohio misused opioids in the past year (SAMHSA, 2021). The rising number of opioid overdose deaths, coupled with the high percentage of individuals with OUDs and past-year opioid misuse, underscores the need for effective interventions and policies to address this issue. Opioid use disorder is primarily treated with medications to assist with withdrawal symptoms and cravings. The commonly used effective medications include methadone, buprenorphine and naltrexone (National Institute on Drug Abuse [NIDA], 2018). Combining medications and psychosocial treatment models addresses client needs holistically and helps sustain recovery

(SAMHSA, 2024). As the opioid epidemic continues to take a heavy toll on individuals, families, and communities, it is crucial to prioritize evidence-based prevention and treatment strategies to prevent overdose deaths, reduce opioid misuse, and support those affected by opioids.

This report describes the use of motivational interventions, especially motivational interviewing (MI) and Motivational Enhancement Therapy (MET) for addressing OUD and preventing overdose deaths. The following sections define and describe MI and MET and summarize the results of a literature review that was conducted to understand the effectiveness of MI and MET in treating OUD. The literature review focused on answering the following questions:

1. What are the substance use outcomes associated with the use of MI and MET to address OUD?
2. What are the treatment retention outcomes associated with the use of MI and MET to address OUD?
3. What are the mortality and morbidity related outcomes associated with the use of MI and MET to address OUD?

Motivational Interviewing

Motivational Interviewing is a therapeutic approach designed to support behavior change in people who are ambivalent or resistant to making changes in their lives (Motivational Interviewing Network of Trainers [MINT], 2023). The MI approach is collaborative, centered around the individual, and supportive of individual autonomy around behavior and choices (Miller & Rollnick, 2023). It is grounded in respect for the individual and belief in their ability to make positive and healthy decisions in their lives. Motivational interviewing works by helping to alleviate the pressure that people feel when they think they need to change but feel stuck and

incapable of moving forward. A strengths-based approach, MI empowers individuals to work through their fears about change. It employs evocative methods to draw out an individual's own motivation and commitment to change. It uses the relationship between the provider and the individual as a tool for personal growth and the provider and the individual enter the relationship on equal footing. Because the individual is the expert on their own experience, they are encouraged to look inward to identify and understand their internal resources and skills that can be applied towards the changes they want to make. This contrasts with a didactic approach to treatment where the provider is seen as the expert and focuses on educating the individual. Motivational Interviewing strengthens individuals' motivation for and commitment to specific goals by exploring their reasons for change within an atmosphere of acceptance and compassion (MINT, 2023). It is most commonly used alongside other treatment methods such as cognitive behavioral strategies and is built on a set of core skills, fundamental principles, and main techniques.

Core Skills of Motivational Interviewing

Motivational Interviewing relies on a set of core skills: open-ended questioning, affirming, reflecting, and summarizing (Miller & Rollnick, 2023). With open-ended questioning, the provider needs to create a dialogue with the individual, asking questions that encourage discussion about what is going on in the individual's life and thinking process. Affirming involves offering positive feedback and reinforcing a sense of believing in oneself and one's ability to do the things needed to move forward in their lives. The provider needs to be a strong reflective listener, repeating the individual's thoughts and feelings back to the individual to demonstrate understanding, attunement, and empathy. When summarizing, the provider needs to

be attuned to what the individual is reporting to effectively capture and restate the individual's ideas around why they are considering change.

Principles of Motivational Interviewing

In addition to a set of core skills, the fundamental principles of MI include expressing empathy, developing discrepancies, rolling with resistance, and supporting self-efficacy (Miller & Rollnick, 2023). Expressing empathy involves building empathy with the individual through reflective listening. To develop discrepancies, the provider points out the gaps between the individual's stated goals and values and their current behaviors. Rolling with resistance requires the provider to avoid argumentative and confrontational language. The provider adjusts to the individual's resistance rather than combatting it. To support self-efficacy, the provider maintains a positive and optimistic mindset, supporting the individual's self-efficacy and autonomy.

Main Techniques of Motivational Interviewing

Motivational Interviewing techniques include engaging, focusing, evoking, and planning (Miller & Rollnick, 2023). The provider engages the individual in establishing a trusting relationship by using reflective listening to understand the individual's concerns and perspective. While engaging, the provider focuses on developing rapport, building a relationship through helping the individual let their guard down, and pushing past ambivalence. When working on focusing, the provider helps focus the work and establishes clear initiatives and goals with the individual. The individual discusses the behavior or issue they want to address while identifying potential barriers to change. The evoking technique helps reveal the individual's motivation and reasons for wanting to change. The provider uses active listening to elicit the individual's own ideas and points out the individual's use of change-oriented behavior. Sessions focus on drawing out the individual's internal motivation and reinforcing ways to build upon it. Finally, when

planning, the provider assists the individual with developing concrete plans to move towards change, building on the established engagement, clearly defined goals and identified motivation. The provider supports the individual as they develop the skills to remove or overcome barriers and establish tangible steps towards change.

History of Motivational Interviewing

While working as faculty in the Department of Psychology at the University of New Mexico in 1976, William Miller conducted clinical trials of behavior therapies for alcohol use disorders, using behavior therapy and empathic listening. He found that two-thirds of the variance in client's drinking outcomes were attributed to the therapist's empathy while delivering the behavioral therapy (Miller, 2023). In 1982, Miller went to Norway on sabbatical and provided role-plays and demonstrations of his developing therapeutic techniques. He began to identify that using Carl Rogers' client-centered approach within his own style of therapeutic practice was giving birth to a specific new method for working with clients. In 1983, Miller wrote a paper describing this approach, which he called Motivational Interviewing. Steve Rollnick, a colleague and upcoming collaborator with Miller, was one of the initial reviewers of this groundbreaking manuscript. Miller then began to focus on turning this therapeutic approach into a treatment method.

While on a separate sabbatical leave, Miller began to work with Steve Rollnick, who was developing his PhD thesis on brief MI with heavy drinkers in a hospital setting. The two collaborated for a year developing the first edition of the MI text on preparing people to change addictive behavior (Miller & Rollnick, 1991). Rollnick contributed a fresh perspective, adding the concept of resolving ambivalence. Miller and Rollnick also incorporated the newly emerging Transtheoretical Model (stages of change) (TTM) developed by James Prochaska and Carlo Di

Clemente (1982). The stages of change, ranging from pre-contemplation to action and maintenance, became a core component of identifying where an individual was said to be on this continuum.

History of Motivational Enhancement Therapy

Project Matching Alcohol Treatments to Client Heterogeneity (Project MATCH), which was completed in 1993, was the largest randomized clinical trial ever conducted with psychotherapies for alcohol use disorders (Miller, 2023). It was designed to compare three different treatment methods and match specific individuals with specific types of therapy. The treatments studied were cognitive behavioral therapy (CBT), 12-step facilitation therapy, and Motivational Enhancement Therapy (MET). The latter was developed to operationalize and standardize MI as a treatment approach so that the effects on patients could be measured systematically. The MET model that was created distilled several key components of MI and organized them into a four-session, manualized treatment modality. There were no significant differences in treatment efficacy between the three treatment types. However, the project revealed that MET was more effective for clients with higher levels of anger and with females with lower initial motivation. In addition, this project helped highlight MI as a valid treatment methodology for alcohol use disorders. The models differ in that MI focuses more on assessment, using the information provided by the individual to provide personalized feedback and move towards change planning. Additionally, MI is fundamentally a client-led approach whereas MET is a structured, manualized intervention. Because it is manualized and prioritizes standardization, MET may contradict the adaptable and client-led philosophy that characterizes traditional MI. High fidelity to MET would require a provider to move forward with the pre-scheduled session activities regardless of the client's stage of change, whereas fidelity to MI

would not allow the provider to move forward with a manualized strategy or stage of treatment that does not match the client's current stage of change. Motivational Enhancement Therapy has been researched as a stand-alone treatment modality as well as in conjunction with other methods. Motivational Enhancement Therapy as a term is sometimes used interchangeably with Motivational Interviewing because it takes the core tenets of MI and incorporates them into a manualized treatment process, even if the manualized version is not entirely aligned with the collaborative and conversational spirit of MI.

Over time, Miller and Rollnick have changed and revised various aspects of MI. Their initial training workshops focused primarily on treatment techniques, but both developers felt the implementation was missing key components. The second edition of the MI text, published in 2002, explained that the spirit of MI prioritizes collaboration, evocation, and autonomy and that an MI approach emphasizes these components of the therapeutic relationship rather than any specific techniques. These first two editions focused on preparing people for change. In 2013, the third edition of the MI text included a chapter emphasizing acceptance and compassion as crucial pieces of the therapeutic approach. Based on the core components noted in these editions, Miller and Rollnick recognized that MI could be a general way of working with clients instead of just an approach for moving clients through the stages of change. The fourth edition, published in August 2023, defined MI as a 'particular way of talking with people about change and growth to strengthen their own motivation and commitment' (Miller & Rollnick, 2023). According to Rollnick, this edition of MI focuses more on individuals' internal motivation and less on external behavior changes. The evocation component was broadened to 'empowerment' to emphasize the importance of the individual's strengths, motivations, resourcefulness, and autonomy (Miller & Rollnick, 2023). Ongoing research combined with practitioner experiences helped move MI

along its trajectory toward continuous improvement. The current adaption of MI is focused on growth, moving beyond individual behavior change and includes discussion and opportunity for organizational, community, and system changes. In addition, the fourth edition revised MI terminology to reflect everyday language more closely.

Although the Transtheoretical Model (TTM) stages of change are not a core component of MI, understanding the TTM stages of change and how individuals at each of the five stages may react to the prospect of change can be beneficial for professionals implementing MI (Prochaska & DiClemente, 1982). In the pre-contemplation stage, the individual is not yet considering making a change. Upon entering the contemplation stage, the individual is beginning to consider making a change but is not yet ready to commit to change. In the preparation stage, the individual is preparing for action to change in the foreseeable future. Individuals are in the action stage when they are actively implementing a plan for change, and they enter the maintenance stage when they consistently and routinely incorporate the changes into their daily life. Table 1 outlines the primary goals and responsibilities for each of the main stages of change for MI-oriented providers.

Table 1*Stages of Change and MI Provider Goals*

Stage	Provider goals and responsibilities
Pre-contemplation	Build rapport
	Gather history and engage in active listening
	Listen for discrepancies between client's reported goals and lifestyle choices
	Provide education
Contemplation	Instill hope, providing information about possibilities through lifestyle changes
	Explore both positive and negative aspects of the lifestyle choice being considered
	Use reflective listening to help the individual begin to identify the disconnect between stated goals and current behaviors
Preparation	Apply summarizing and reflecting back techniques to help the individual move towards change
	Assess the individual's commitment towards change
	Offer a menu of choices and strategies
Action	Identify supports and barriers to change
	Identify unexpected hurdles and help individual define coping strategies
	Assist individual in identifying sources of support
Maintenance	Help individual track their progress
	Continue to track gains associated with healthy change
	Identify potential relapse triggers and continue to support skill-building to prevent relapse
	Support individual in actively maintaining changes

Literature Review Process

Literature reviews are often conducted to understand a topic in depth. The stages of a literature review involve creating a search strategy, identifying relevant sources, summarizing, and organizing them around relevant themes, and synthesizing the information that is presented by the sources. The purpose of this literature review was to assess the effectiveness and utility of

motivational interviewing and motivational enhancement therapy by identifying and synthesizing relevant studies examining their outcomes.

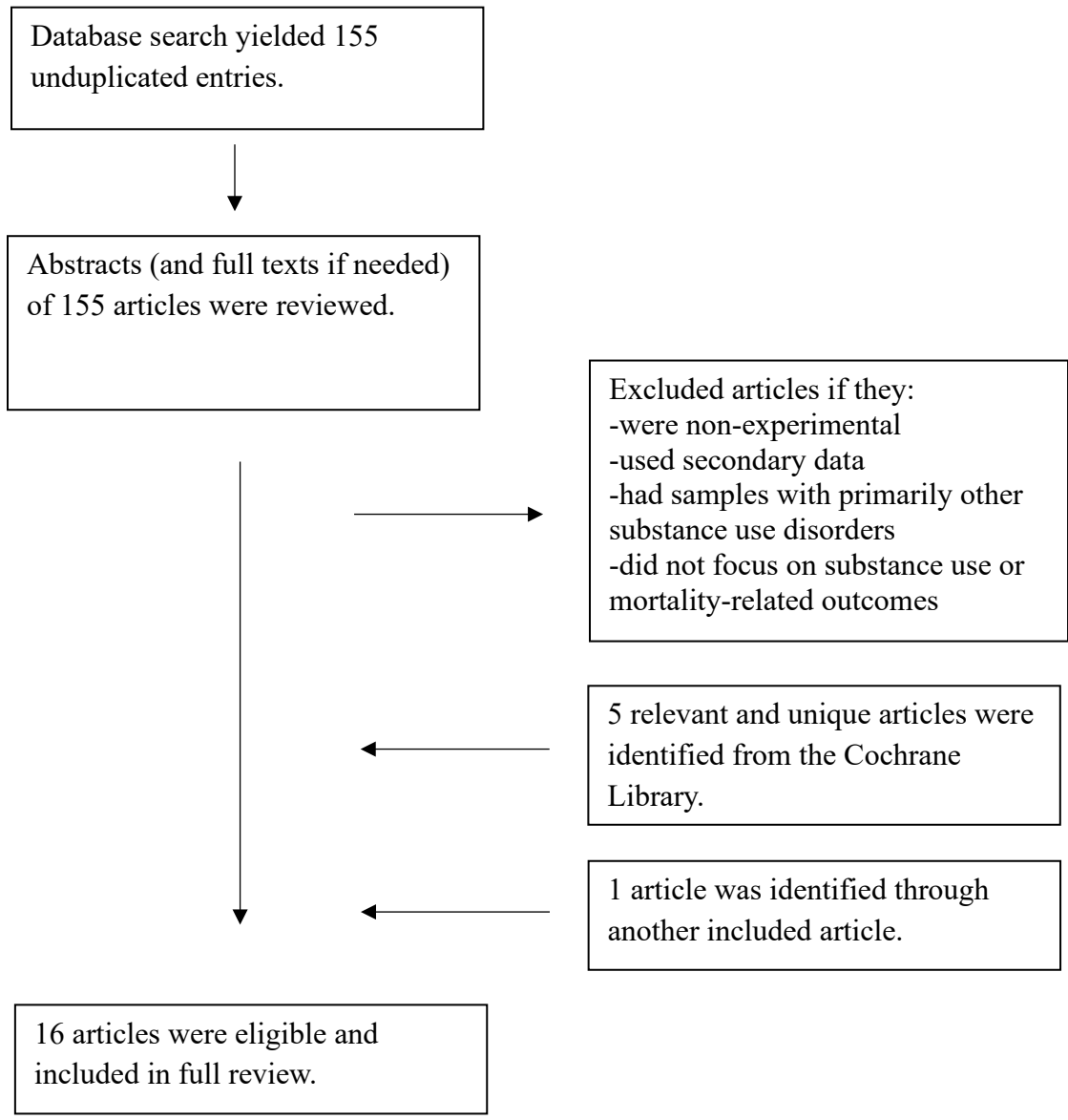
The first phase of the literature review included developing and refining relevant search phrases that represent the topic of interest and identifying key social and behavioral sciences research databases for use in the literature search. A comprehensive search was conducted using the following databases: PsycINFO, MEDLINE, SocINDEX, Psychology and Behavioral Sciences Collection. The search included combinations of key terms related to MI and MET and opioid use disorder such as “(Motivation* n3 therap* AND opioid use disorder)” phrases. The search was carried out in January 2024 and encompassed all existing literature up to that date. This search yielded a total of 155 unduplicated results. Abstracts and full texts of the articles or conference abstracts were screened. They were included in the full review if they were experimental in design, used primary data, and had samples primarily with OUDs or opioid misuse. Articles and conference abstracts were excluded if they were not experimental in design, used secondary data, or did not focus on substance use or mortality-related outcomes. When conference abstracts lacked sufficient information for inclusion in the review, an attempt was made to locate a related article using the same dataset. If a related article was not found or the article was determined to be irrelevant, the conference abstract was excluded from full review. One additional article was identified using the same primary data but examining drug use outcomes at a different follow-up point. Eleven articles met the inclusion criteria.

The second phase included using the same search terms to conduct a related search in the Cochrane Library, a well-reputed healthcare and medical research database that includes clinical trials, systematic reviews, and meta-analyses (Cochrane, 2023). This search yielded five unique and relevant articles that met criteria for an in-depth review. The review included a total of 16

articles (see Appendix A for a full summary of the articles). All studies used experimental designs, where participants were randomly assigned to one of the treatment groups that were compared to identify statistically significant differences. The final phase of the literature search used the Motivational Interviewing Network of Trainers (MINT) database of MI-focused controlled trials (MINT, 2023); however, no eligible studies were identified. Figure 5 illustrates the literature review process.

Figure 5

Literature Search Process Funnel for Identifying Motivational Interviewing/Motivational Enhancement Therapy Outcome Studies



Summary of the MI/MET Outcome Studies

All studies included in this review employed experimental designs where participants were randomly assigned to a MI/MET condition or another treatment condition for comparison purposes. They often combined MI/MET with another treatment when evaluating the outcomes of the MI/MET. Fourteen out of the 16 studies implemented MI, while the remaining two studies employed MET. Studies were classified as including a blended motivational intervention when the effect of the intervention could not be solely attributed to MI or MET, because the study evaluated a combined intervention. Five of the reviewed studies featured blended motivational interventions, which were compared to control groups receiving minimal intervention, such as educational lectures or usual care. In these instances, MI served as a component of a more comprehensive intervention strategy. Due to the distinct nature of blended motivational interventions, they will be discussed separately from the other MI studies.

Participants across all studies were primarily identified as having opioid use disorder (OUD) seeking treatment or opioid misuse (such as seeking early refills and/or taking higher doses than prescribed) or were actively enrolled in a medication-assisted treatment program. All studies focused on either drug use and/or mortality risk outcomes. In addition, six studies examined treatment retention, and six focused on mortality/morbidity-related outcomes. Twelve studies included participants from special or vulnerable populations such as individuals experiencing homelessness (Banta-Green et al., 2019), partners of pregnant women (Jones et al., 2011), inpatients from surgical or gynecological wards (Otto et al., 2009; Zahradnik et al., 2009), syringe exchangers (Kidorf et al., 2009), individuals who had been recently released from detention in compulsory treatment center (Zhong et al., 2015), and those who were positive for Hepatitis C (Otiashvili et al., 2012). Nine out of 16 studies were conducted in the U.S., two in

China, two in Germany (used the same primary data but examined outcomes at different follow-up assessments), one in Australia, one in the Republic of Georgia, and one in Scotland.

Motivational Interviewing and Motivational Enhancement Therapy Outcomes

This section aims to provide an overview of studies that have assessed the impact of MI and MET on drug use, retention, and mortality/morbidity-related outcomes. Among the 16 studies reviewed, 12 specifically examined outcomes of MI/MET. All studies focused on opioid use outcomes, while four reported retention-related outcomes, and five investigated mortality and/or morbidity related outcomes. Sample sizes varied across studies, ranging from 32 to 542 participants.

The number of MI/MET sessions was not consistently reported, and the number of sessions varied greatly. For instance, Bohnert et al. (2016) evaluated a single 30-minute MI session, while Otto et al. (2009) and Zahradnik et al. (2009) assessed the impact of two MI sessions. In contrast, some studies examined more intensive versions of MI or MET. Kidorf et al. (2009) implemented eight MET sessions alongside 16 treatment readiness group sessions. Jaffray et al. (2014) trained pharmacists in MI techniques, allowing them to interact with participants using these techniques throughout the six-month study period during methadone dose pick-ups.

Drug Use Outcomes

Outcomes related to opioid use were frequently assessed through self-report measures. Few studies used urine drug tests to measure opioid use. Studies often reported the number of days of drug use (Jaffray et al., 2014; Kidorf et al., 2009), cessation of drug use, and reduction of drug use including “true” reduction, which was defined as at least a 25% decrease in prescription drug dosage (Zahradnik et al., 2009; Otto et al., 2009), and urine drug test results

(Cochran et al., 2019; Gryczynski et al. 2021). Overall, the studies reviewed presented mixed findings on the effectiveness of motivational interventions on reducing opioid use.

Studies with Positive Results. Two studies found evidence supporting the use of MI/MET for OUD based on self-reported data on heroin and non-medical prescription opioid (NMUPO) use. Kidorf et al. (2009) evaluated the effectiveness of an intervention that combined motivational enhancement and treatment readiness groups on rates of substance abuse and treatment entry among a sample of 281 individuals with OUD. Participants were randomly assigned to one of the three study conditions over a four-month period: (1) the motivational referral (MRC) consisting of eight individual motivational enhancement sessions and 16 treatment readiness group sessions, (2) the motivational referral plus incentives (MRC+I) condition that provided monetary incentives for attending sessions and enrolling in treatment, or (3) a standard care referral condition (SRC). All interventions were delivered by individuals trained in MI and followed guidelines outlined by Miller & Rollnick (2002). The authors found that participants who received MRC+I reported fewer days of heroin use per each 30-day assessment (19.5) compared to those in the MRC (25.1) and SRC (25.9) groups. Those in the MRC+I group also reported fewer days of injection use per each one of the 30-day assessments (19.1) compared to individuals in the other two groups (MRC = 23.5 and SRC=23.8). All differences were statistically significant.

Bohnert et al. (2016) examined the impact of one 30-minute MI-based session to reduce opioid misuse and overdose risk behaviors among a sample of emergency department (ED) patients at risk for prescription opioid overdose. In this pilot randomized controlled trial, participants received either MI plus educational enhanced usual care (MI+EUC) or EUC alone. The content of the intervention was based on Miller and Rollnick's manualized and evidence-

based strategy for reducing risky behaviors by enhancing self-efficacy and motivation (2013) and was delivered by two master's-level therapists with prior training and experience in MI. Additional MI training, computer-supported decision-making during sessions, and weekly supervision with reviews of a randomly selected subset of audio recorded sessions, were also used to ensure fidelity. The authors hypothesized that MI would reduce self-reported overdose risk behaviors during the six months following randomization compared to EUC alone. Apart from the primary overdose risk measures, the authors also captured self-reported non-medical use of prescription opioids (NMUPO). Participants who received MI+EUC reported significantly greater reductions in NMUPO (50% reduction) as compared to those receiving EUC (39% reduction) alone.

Studies with Mixed Results. Five studies yielded mixed but promising results on the effectiveness of motivational interventions for reducing opioid use. In some studies, initial analyses yielded statistically significant differences favoring the intervention. However, subsequent analyses within the same study, follow-up assessments, or related follow-up studies produced inconsistent results. These additional findings either supported the intervention's effectiveness or showed no statistically significant differences between the intervention and control groups, leading to mixed outcomes for the overall study.

Saunders et al. (1995) examined the effectiveness of a motivational intervention among 122 participants with OUD who were receiving methadone maintenance treatment in Australia. Participants were randomized into an intervention or a control group. The intervention group received a one-hour session of MI and then a follow-up session after one week while the control group received educational information about drug use. Information on fidelity and training for MI was not reported. There was a statistically significant reduction in the severity of opiate

dependence for both groups over time, but no statistically significant differences were found between the two groups. The groups were also not statistically significantly different in time until relapse as measured by participants' opiate use diary. When the comparison was made by including participants that dropped out of methadone maintenance treatment, the MI group showed a longer time to relapse than the control group.

Zahradnik et al. (2009) evaluated the effectiveness of a brief motivational intervention on the reduction of prescription drug use among 126 hospital patients with problematic prescription drug use. The study sample reported using analgesics including opioids, sedatives, hypnotics, or caffeine. Participants were randomly assigned to either the intervention or control group. Those in the intervention group received two sessions of MI, with the first session conducted in the hospital (30-45 mins) and the second session delivered over the phone (20-30 mins). Providers were trained in MI principles, basic techniques, and had practical exercises for two weeks. Motivational interviewing sessions were recorded and evaluated to ensure fidelity. Reduction and cessation of drug use, as well as "true" reduction in dosage, were compared between baseline and three-month follow-up. The authors defined a clinically meaningful or "true" reduction in prescription drug intake as a dosage that decreased by greater than 25% as compared to baseline. There were no statistically significant differences in measures of prescription drug use reduction between the MI and control group. A higher percentage of the MI group (18%) compared to the control group (9%) discontinued drug use, however, the difference was not statistically significant. More participants in the MI group had "true" reduction in drug intake (over 25% decrease) compared to the control group (30% versus 51.8%, respectively) and the difference was statistically significant. When examining "true" reductions in different drug classes, a statistically significant effect of the intervention was

observed for hypnotics/sedatives and opioids with a moderate effect size. However, there were no statistically significant differences in discontinuation of different drug classes. A later study by Otto et al. (2009) examined the 12-month follow-up outcomes of the same study. They did not find any statistically significant effect of the intervention on reduction and cessation of prescription drug use. There were also no statistically significant differences among drug classes.

Cochran and colleagues (2019) assessed feasibility and acceptability of a Brief Motivational Intervention-Medication Therapy Management (BMI-MTM) intervention among a sample of 32 individuals misusing prescription opioids. Participants were randomized to two months of either standard medication counseling (SMC) or SMC+BMI-MTM. The SMC+BMI-MTM condition consisted of medication therapy management (MTM), brief motivational interviewing (BMI), patient navigation (PN), and naloxone training and referral. The intervention was delivered by licensed pharmacists and master's level social workers trained in MI, with the latter group receiving periodic supervision by a MINT trainer for fidelity. Primary study outcomes included feasibility (i.e., study screening/enrollment rates and session completion rates), acceptability (i.e., self-reported patient satisfaction), retention of BMI-MTM recipients at the study assessment time points, and mitigation of opioid medication misuse (i.e., self-reported opioid medication misuse). Other outcomes included self-reported pain and depression, as well as cannabis and opiate use as measured by urine drug tests. The study demonstrated promising but mixed results. Although not statistically significant, the BMI-MTM condition resulted in greater reductions in self-reported medication misuse and objective opioid use over time than SMC alone. At two months, there were no statistically significant differences in misuse among participants, but at three months, the authors found a statistically significant

improvement in misuse among the BMI-MTM recipients with only one individual reporting continued misuse. Multivariate analyses revealed statistically significant improvements in the percentage of opioid-negative urine drug tests for both groups across time, with greater improvement for BMI-MTM recipients. Lastly, a promising but not statistically significant trend indicated decreases in positive opiate toxicology screens for BMI-MTM recipients.

Gryczynski et al. (2021) conducted a randomized controlled trial to compare the effects of the Navigation Services to Avoid Rehospitalization (NavSTAR) program and treatment as usual (TAU) among 400 hospitalized medical/surgical patients with comorbid stimulant use disorder. The study outcomes were observed over 12 months and included hospital service use (readmissions and ED visits), entry into SUD treatment, substance use, HIV risks, and quality of life. The NavSTAR program was a patient navigation model consisting of proactive barrier resolution, motivational intervention, and treatment linkage and care coordination. Although the extent of engagement depended on patient needs, navigators reported using motivational intervention strategies at 54.9% of documented encounters, and 93.0% of participants received motivational intervention at some point. The intervention was delivered by master's-level social workers and monitored for fidelity (i.e., random screening of audio-recorded sessions, and feedback regarding adherence to motivational interviewing). The TAU group received standard care provided by the medical team and the addiction consultation service. This included counseling, management of withdrawal symptoms when necessary, the initiation of methadone or buprenorphine maintenance treatment, and referrals to community-based SUD treatment programs. Overall, participants in the NavSTAR intervention did not differ from those in the TAU group on most measures of substance use. However, an important exception was observed for participants with OUD. At 6-month follow-up, participants with OUD in the NavSTAR

group had statistically significantly fewer opioid positive urine samples than those in the TAU group. This would suggest that the NavSTAR intervention was more effective at reducing short-term opioid use among individuals with OUD. However, the statistically significant between-group difference in opioid use was not maintained at 12-month follow-up.

Studies with No Statistically Significant Effect. Two studies found no statistically significant difference between the intervention and control group in any opioid use-related domains. Jaffray et al. (2014) investigated how training pharmacists in MI could impact outcomes such as illicit heroin use using a sample of 542 methadone maintenance treatment recipients in Scotland. Participants were randomized to either an intervention group that included enhanced pharmacy services with MI, in which pharmacists utilized MI techniques when interacting with participants for six months, or to the control group that received usual pharmacy services. Pharmacists in the intervention condition were trained in MI by Scottish Training on Drugs and Alcohol (STRADA)-accredited MI trainers. Information on fidelity to MI was not provided. The training aimed to increase communication between the pharmacists and the participants and teach specific communication skills such as reflective listening and eliciting change talk. Heroin and other illicit drug use in the last 30 days were measured via self-report at baseline and 6-month follow-up. The proportion of participants using heroin in the last 30 days decreased by 16% (from 48.4% to 32.4%) for the intervention group and by 19% (from 50.3% to 31.4%) for the control group. This difference was not statistically significant. There were also reductions in the proportions of participants who used other illicit drugs but the difference between the groups was not statistically significant.

A more recent randomized controlled trial explored whether a single session with a hospital-based addiction consult team, the Substance Use Treatment and Recovery Team

(START), could reduce substance use and hospital readmission among 88 inpatients with a probable alcohol or opioid use disorder (Ober et al., 2023). The START intervention consisted of motivational and discharge planning sessions delivered by an addiction medicine specialist and care manager, while the usual care (UC) condition consisted of the hospital's current practices for managing patients with alcohol or opioid use disorders. The MI component was based on the third edition of the MI text by Miller & Rollnick (2013), while the intervention was delivered by a licensed clinical social worker and a board-certified addiction psychiatrist. The authors reported high overall intervention fidelity, with an 89% completion rate for all the intervention components. One of the primary study outcomes was self-reported days of opioid use in a sample of patients with OUD. The authors found no statistically significant differences between the START and UC groups in opioid use. At one-month follow-up, the START intervention had no statistically significant effects on use of opioids after discharge from the inpatient stay. In fact, participants in both groups reported using fewer substances. A post-hoc analysis also revealed no significant differences in substance use based on whether participants received follow-up care for their OUD. The authors attributed the lack of statistically significant results to a small sample size and the possibility that patients discharged from the hospital after illness or injury might use fewer substances immediately after their hospital stay, perhaps not returning to their pre-hospital substance use patterns right away, if at all.

Summary of Drug Use Outcomes

The reviewed studies yielded inconsistent results regarding the effectiveness of motivational interventions in decreasing opioid use among individuals with OUD or opioid misuse issues. Two studies found that motivational interventions helped reduce drug use, four

studies showed promising but mixed results, and four studies found no statistically significant differences between the intervention and control groups.

Two studies reported positive results based on self-reported data on heroin and non-medical prescription opioid use. Kidorf et al. (2009) reported that participants in the motivational referral plus incentives group, which included both motivational enhancement sessions and incentives for attendance, had statistically significantly fewer days of heroin use and injection use, per each 30-days of the four month-intervention period, compared to participants in both the motivational referral and standard care referral groups. At six-month follow-up, Bohnert et al. (2016) found that participants receiving motivational interviewing plus educational enhanced usual care, consisting of a single 30-minute session of motivational intervention, had a statistically significantly greater reduction in non-medical prescription opioid use as compared to participants receiving educational enhanced usual care alone. Notably, both studies examined large samples (over 200 participants) and focused on special or at-risk populations, including individuals with OUD who were also syringe exchangers (Kidorf et al., 2009) and ED patients at risk for prescription opioid overdose (Bohnert et al., 2016).

Four studies (Saunders et al., 1995; Zahradnik et al., 2009; Cochran et al., 2019; Gryczynski et al., 2021) showed promising trends in favor of the intervention groups in some of the analyses they conducted. For example, Saunders et al. (1995) found a significant decrease in the severity of opiate dependence across both groups but no significant difference in the reduction of opioid use and time to relapse between the groups. However, a subsequent analysis in the same study, which included dropout participants in the analysis, showed that the control group was more likely to relapse sooner than the motivational group (Saunders et al., 1995). Zahradnik et al. (2009) found that a statistically significant number of participants in the MI

group experienced a “true” reduction in drug intake, compared to the control group. However, a subsequent study utilizing the same primary data, but examining 12-month follow-up comparisons, failed to find any statistically significant differences between the groups across any of the outcome measures (Otto et al., 2009). Similarly, Gryczynski et al. (2021) identified a significant effect of a motivational intervention in reducing opioid use at the 6-month follow-up, yet this effect did not persist at 12-month follow-up. In contrast, another study did not find any significant differences between the intervention and control groups at the end of the treatment; however, a significant difference emerged later, at the 3-month assessment point (Cochran et al., 2019). Sample sizes across these four studies ranged from 32 to 400 individuals. There was also variation in terms of intervention delivery and timeframe, ranging from a single 1-hour session to a two-month intervention.

Two studies (Jaffray et al., 2014; Ober et al., 2023) found no statistically significant differences between the intervention and control groups in any of the opioid use-related domains. Most of the studies reported findings or trends that were consistent with their initial hypotheses or predicted direction but did not reach statistical significance. Sample sizes across the studies ranged from 88 to 542 participants. Results presented by Jaffray et al. (2014) indicated that the intervention did not reduce heroin use, and despite an overall decrease in the proportion of patients using illicit heroin in the last 30 days, there was no statistically significant difference between the groups at follow-up. Most recently, Ober et al. (2023) found that participants in both groups reported using fewer substances, but there were no statistically significant differences in opioid use between the START and UC groups. There were also no significant differences in substance use based on whether participants received follow-up care for their OUD.

Sample sizes for the ten studies that investigated drug use outcomes ranged from 32 to 542 participants, and intervention delivery and length varied across studies. Despite some promising findings, the overall effectiveness of motivational interventions in reducing opioid use among individuals with OUD remains inconclusive based on the reviewed studies.

Retention Outcomes

Three studies focused on treatment retention in addition to drug use outcomes (Jaffray et al., 2014; Kidorf et al., 2009; Saunders et al., 1995). Retention was often measured as length of stay in treatment and treatment completion. Two of the studies examined the effects of MI on retention in methadone maintenance treatment programs. Saunders et al. (1995) compared MI to a control group and found that participants in the MI group stayed in treatment statistically significantly longer than those in the control group (151 vs. 127 days, respectively). In their comparison of enhanced pharmacy services (intervention group) with usual pharmacy services, Jaffray et al. (2014) found that a slightly higher percentage of the participants in the intervention group (88%) stayed in treatment at six months compared to control group (81%), but the difference was not statistically significant. Finally, in their comparisons of motivational referral condition plus incentives to motivational referral condition alone, Kidorf et al. (2009) found that participants in the motivational referral condition plus incentives group attended a statistically significantly higher proportion of motivational enhancement and treatment readiness group sessions compared to those in the motivational referral condition group.

Summary of Retention Outcomes

Two of the three studies that examined retention outcomes found statistically significant differences favoring MI/MET groups. Motivational interventions were associated with more days in treatment (Saunders et al., 1995) and higher numbers of sessions attended (Kidorf et al.,

2009). Although not statistically significant, Jaffray et al. (2014) found that a higher percentage of individuals in the intervention group stayed in treatment compared to the control group.

Mortality/Morbidity Related Outcomes

Four studies investigated outcomes related to mortality and morbidity, including overdose risk behaviors, overdose events, other high-risk behaviors such as HIV risk behaviors or injection use, hospitalizations, and ED visits. Two studies focused on the number of overdose events and HIV-related sexual and injection risk behaviors (Coffin et al., 2017), overdose risk behaviors (Bohnert et al., 2016), hospitalization (Gryczynski et al., 2021; Banta-Green et al. 2019), ED visit (Banta-Green et al., 2019), and time to first overdose event (Banta-Green et al., 2019).

Coffin et al. (2017) examined the effectiveness of a repeated-dose MI intervention named REBOOT for addressing opioid overdose and related risk behaviors. The study recruited 63 participants with OUD through a naloxone distribution program and randomized them to either an intervention or control group. The intervention group received REBOOT, which focused on discussions around the prevention of overdose at study entry, and at four, eight, and twelve months into the study. The providers were trained by clinical psychologists with expertise in MI and behavioral interventions. To ensure fidelity, the intervention sessions were audiotaped and over 10% of them were randomly selected and reviewed by a psychologist. The control group were given an information packet about harm reduction sites, SUD treatment programs, and received minimal attention, except for assistance with the referrals when the participant requested. The REBOOT intervention was statistically significantly associated with a reduced number of overdose events. There were no statistically significant differences in opioid use and HIV-related sexual and injection risk behaviors between the groups. Similarly, Bohnert et al.

(2016) found statistically significant differences in the frequency of engaging in overdose risk behaviors between an intervention group (MI+EUC) and the control group (EUC-only) at a six-month follow-up. The MI+EUC group reported an average of 40.5% reduction in the frequency of overdose risk behaviors, which was statistically significantly greater than the 14.7% reduction reported by the EUC-only group.

Gryczynski et al. (2021) tracked mortality among 400 adults with comorbid SUDs who were patients at a hospital in Maryland. The authors recorded 48 (12%) study participant deaths over the course of the study, with no statistically significant difference in survival time between individuals in the NavSTAR and the TAU groups. Compared to individuals in the TAU group, participants in the NavSTAR group had a statistically significantly lower rate of inpatient readmissions and were less likely to be readmitted within 30 days. Additionally, NavSTAR participants entered SUD and OUD medication-assisted treatment programs statistically significantly faster than TAU participants. Despite these promising trends, the authors noted that the effects for the NavSTAR intervention decreased steadily for each subsequent 30-day period.

Banta-Green et al. (2019) evaluated the effectiveness of MI for reducing risky opioid use among a sample of 241 adults who received care in an ED due to opioid overdose. Participants who were randomized to the MI-inspired intervention group received overdose education (video and informational brochure), a brief behavioral change counseling session to identify overdose risk and learn about steps to take to reduce the risk of overdose, and a naloxone kit. The control group only received an informational brochure. Fidelity was enhanced using audio recorded sessions, training, and supervision. Despite not using a full MI intervention, fidelity was measured using scales from the Motivational Interviewing Treatment Integrity 3.1.1 (MITI) Code (Moyers et al., 2010). Fidelity measures included behavioral counts for the MI

interventionists and “MI Spirit, an average measure of the quality of MI delivery” (Banta-Green et al., 2019, p. 193). The analyses showed that 85% of all participants had an ED visit and 55% had a hospital admission. There were no statistically significant differences between the intervention and control groups. Additionally, time to first overdose event was not statistically significantly different between the two groups.

Summary of Mortality/Morbidity Related Outcomes

Three out of four studies found a statistically significant effect of MI on mortality-related risk factors. One study found that MI was associated with fewer overdose risk behaviors (Bohnert et al., 2016) and another study found a reduction in the number of overdose events (Coffin et al., 2017). Gryczynski et al. (2021) found that the NavSTAR group had a significantly lower rate of hospital admissions compared to the control group. In contrast, Banta-Green et al. (2019) did not find a statistically significant difference between the MI and control groups in terms of hospital admissions and ED visits. However, it is important to note that the two studies differed in their MI approach. While Gryczynski et al. (2021) utilized a patient navigation system with proactive service linkage support, Banta-Green et al. (2019) employed a more educational approach with a focus on preventing overdose.

Blended Motivational Interventions

Five of the 16 reviewed studies examined outcomes of blended motivational interventions, and each incorporated a unique combination of therapeutic approaches and components along with MI or MET. All five studies focused on opioid use outcomes, and of these, four also reported on retention-related outcomes and one also investigated mortality/morbidity-related outcomes. Two studies were conducted in China, one in the Republic

of Georgia, and two in the U.S. Sample sizes varied across studies, ranging from 70 to 180 participants.

Drug Use Outcomes

All five studies examined drug use outcomes associated with blended motivational interventions. Drug use was often measured through self-report (Chen et al., 2019; Jones et al., 2011) or urine drug tests (Otiashvili et al., 2012.; Nunes et al., 2006; Zhong et al., 2015). Two studies employed both self-report and urine drug tests to provide a more comprehensive assessment of drug use outcomes (Nunes et al., 2006; Zhong et al., 2015).

Studies with Positive Results. Two studies found statistically significant impacts of a blended motivational intervention on drug use outcomes. Otiashvili et al. (2012) examined the impact of an intervention consisting of behavioral treatment and naltrexone (BT + N) in the Republic of Georgia among 40 male participants with opiate dependence and a drug-free female sexual partner. The BT + N was a multi-component behavioral therapy approach that included individual MI to foster treatment engagement in the male participant, MI for the couple aimed at improving the couple's relationship and the female partner's support of the participant's treatment, and concurrent rapid entry into detoxification followed by naltrexone maintenance. Drug-abstinence contingency management (CM) was an additional component of the intervention, rewarding participants with financial incentives for providing drug-free urine samples. The inclusion of female partners in the study was based on the cultural understanding that in Orthodox Georgian society, traditional family bonds and interpersonal relationships play a crucial role in individual behavior. This study focused on the feasibility of recruiting and retaining opiate abusing men and their female partners in a randomized controlled trial and on the drug use and drug-risk behavior outcomes both during the treatment administration as well as

at one-month, three-month, and six-month post-treatment follow-up. Drug testing occurred weekly, and the intervention group received the cash equivalent of \$9US for each urine sample that tested negative for opioids and buprenorphine. Additionally, they participated in a structured, 22-session MI counseling program with sessions held once a week. Sessions 1-6 were individual sessions focused on enhancing motivation to stop or reduce drug use; sessions 7-18 included participants' female partners and focused on applying MI techniques to couples counseling to improve partner interactions and provide education about HIV/AIDS; and sessions 19-22 were individual MI sessions focused on building change behaviors. All participants in the intervention group were offered the option of entering a 14-day detoxification program shortly after study entry, which included a 22-week supply of naltrexone to support opioid abstinence. The usual care group participants were asked to provide weekly urine samples and received manualized education sessions on topics of drugs of abuse, anger management, drug refusal skills, HIV/AIDS, hepatitis, and relaxation training. If requested, participants were provided with information about community resources and referrals to detoxification programs. The BT + N group had statistically significantly fewer opioid-positive urine drug samples and more opioid-negative urine drug samples than the usual care group.

Chen et al. (2019) examined the effectiveness of a motivation-skill-desensitization-mental energy (MSDE) intervention on drug abstinence as measured by self-report. Recruiting from a rehabilitation center in China, the study enrolled 89 male heroin users receiving detoxification treatment and randomly assigned them to either an intervention or control group. Participants in the control condition received lectures on various health education topics and coping skills. The MSDE intervention consisted of MI, coping skills training, eye movement desensitization and reprocessing (EMDR), and mindfulness-based psychotherapy. The

intervention combined MI for six sessions with 12 sessions of skills training, 12 sessions of mindfulness-based psychotherapy, and 10 sessions of EMDR. The MI component of the intervention was designed to increase the participants' readiness to change and improve treatment compliance. An intervention manual was developed and used for training the therapists, who were all senior psychological consultants. To ensure fidelity, a team discussion was held after completing each session and study therapists were supervised by a psychological research team. The MSDE intervention had a significantly greater effect on drug abstinence than the control condition at each follow-up time point, from one month to three years.

Studies with Mixed Results. One study (Jones et al., 2011) found mixed results regarding drug use outcomes, which varied by the timing of the comparison. The authors investigated the effectiveness of a motivational intervention that aimed to engage the male partners of opioid-dependent pregnant women in treatment in an effort to improve outcomes for their pregnant partners. Participants were randomized to the intervention which was called HOPE (Helping Other Partners Excel) or TAU. The HOPE intervention consisted of weekly MET sessions for six weeks, implemented in 60-minute individual sessions and focused on establishing rapport, encouraging belief in change, evoking change strategies, reinforcing positive changes in behavior, and supporting self-efficacy. Concurrently, participants in the HOPE group received case management to facilitate rapid entry into detoxification and aftercare programming. Following this phase, they received 12 weekly sessions of couples therapy that covered topics such as pregnancy and prenatal development education and the impact of drug use and other risky behaviors on fetal development. For all 22 weeks of the treatment program, urinalyses were conducted twice a week. Participants received \$25 for each urine sample that tested negative for opiates and cocaine. Throughout the study period, TAU participants received

weekly 60-minute support group sessions that covered drug education and other topics generated by the participants. Upon request, participants in this group could receive assistance enrolling in couples counseling and receiving a referral to additional programming. Fidelity was monitored through audiotaped sessions and HOPE intervention staff received supervisory feedback based on recorded sessions. Four weeks into the study, the intervention group's reduction in days of past-month heroin use was twice as large as the reduction in the TAU group (HOPE reduction: 22.3 days; TAU reduction: 10.3 days) and the difference was statistically significant.

Interestingly, between the follow up assessments conducted at weeks 4 and 28, the intervention group increased their days of drug use, while no notable change in use was found for the TAU group.

Studies with No Statistically Significant Effect. Two studies reported no statistically significant differences in drug use outcomes between the compared groups. In 2015, Zhong et al. examined outcomes for 180 individuals with OUDs who were released from compulsory treatment centers in Shanghai. This study assessed whether a one-year comprehensive psychosocial intervention (CPI) including MI and CBT would be more effective than usual community care. The MI component was hypothesized to facilitate the participants' intrinsic motivation for remaining abstinent and improving their quality of life. The CPI group received individual and group sessions, incorporating both MI and CBT. The control group received monthly visits by a social worker, urine tests, and simple advice regarding life events. To ensure fidelity to the intervention, all the researchers and supervisors involved in administering the CPI intervention were trained and participated in mock interviews to measure intervention consistency, identifying over 90% consistency in the intervention implementation. Each site included a supervisor to ensure high quality implementation of the CPI intervention. There were

no statistically significant differences found in drug urine tests or self-reported drug use between the two groups either early in the study or at the 12-month follow up period. At the end of the intervention, there were no statistically significant differences in relapse rates between the two groups. However, there was a lower relapse rate than is usually expected with this type of drug use among participants in both groups.

Nunes et al. (2006) compared the effects of Behavioral Naltrexone Therapy (BNT) and Compliance Enhancement (CE) on treatment retention and drug use outcomes among a sample of 80 treatment-seeking individuals with a heroin use disorder. Participants were randomized to either BNT (i.e., motivational interviewing, cognitive-behavioral relapse prevention, network therapy, voucher incentives, skill building, and community reinforcement approach) or CE (i.e., psychoeducation, discussion of naltrexone compliance, supportive problem solving, and 12-step principles) and received two sessions per week for six months. Throughout the study, drug use was measured using both self-reported and urine drug samples. The BNT intervention was delivered by trained and qualified psychologists, while adherence to the intervention was ensured through checklists and review of session audiotapes. The authors found no statistically significant differences in opioid use among individuals who received BNT or CE. Specifically, the percentage of participants with high rates (>80%) of opioid-free urine samples did not differ significantly between the BNT and CE groups and both groups experienced improvements over time. During the first month of treatment, 44.4% of BNT group and 57.6% of CE group reported at least 80% of opioid-free urine samples. During months three and six of the intervention, those percentages improved to 76.5% of participants in the BNT group and 88.9% of the CE group.

Summary of Drug Use Outcomes

Three out of five studies that used a blended motivational intervention found improved drug use outcomes among the intervention group compared to the control group with a statistically significant difference. Otiashvili et al. (2012) reported that participants in the BT+N intervention were significantly more likely to have negative urine drug screening results than participants in the control condition. Similarly, Chen et al. (2019) found that the MSDE intervention group reported significantly higher abstinence rates at follow-up compared to the control group. However, Jones et al. (2011) found that while participants in the HOPE intervention showed a significant reduction in heroin use compared to the treatment as usual (TAU) group at one-month follow-up, the effect was not sustained, with usage increasing from week 4 to week 28. Zhong et al. (2015) reported no statistically significant differences in drug urine tests or self-reported drug use between the intervention and control groups, with an overall low relapse rate across both groups. Similarly, Nunes et al. (2006) did not find a statistically significant difference in the number of opioid-free urine samples between the BNT and CE groups although both groups showed improvement over time. These mixed findings suggest that the effectiveness of blended motivational interventions for reducing drug use may vary depending on the specific intervention components and the duration of follow-up.

Retention Outcomes

A total of four studies examined the effect of blended motivational interventions on treatment retention outcomes. One study (Nunes et al., 2006) found statistically significant differences in retention rates between the compared groups. Nunes et al. (2009) found that participants in the BNT group were statistically significantly more likely to stay in treatment over six months than the CE group, however, both groups displayed gradual attrition over the

course of the treatment. In the first month of treatment, 69.4% of individuals in the BNT group were retained compared to 48.5% in the CE group, while at six months those retention rates dropped to 22.2% of the BNT group and 9.1% of the CE group.

One study (Jones et al., 2011) yielded mixed results. Jones et al. (2011) found that at one-month post-randomization, participants receiving the motivational intervention remained in treatment five times as many days as TAU participants. By the 28-week post-randomization period, there was no statistically significant difference between groups regarding this outcome.

Two studies (Otiashvili et al., 2012; Zhong et al., 2015) did not find any statistically significant difference in retention rates between the compared groups. Otiashvili et al. (2012) examined MI plus CM in opiate dependent men in the Republic of Georgia. Twelve of 20 participants in the intervention group completed the study, while 11 of the 20 participants in the usual care group completed the study, with no statistically significant difference. In the study completed by Zhong et al. (2015), 81.6% of participants in the intervention group remained in the program at the end of the 12-month intervention period, compared with 86.1% of participants in the control group, without a statistically significant difference.

Summary of Retention Outcomes

The findings related to retention outcomes were largely mixed. One study (Nunes et al., 2006) found a statistically significantly higher retention rate for the BNT group compared to the CE group, despite both groups experiencing gradual attrition. Another study by Jones et al. (2011) initially found that at one-month post-randomization, participants receiving a blended motivational intervention stayed in treatment longer than those receiving TAU, but this difference was not sustained by the 28-week follow-up time point. In contrast, two studies by

Otiashvili et al. (2012) and Zhong et al. (2015) did not find statistically significant differences in retention between intervention and control groups.

Mortality/Morbidity Related Outcomes

One study examined mortality/morbidity related outcomes by investigating needle sharing behaviors. In Otiashvili et al.'s 2012 study, 60% of all participants tested positive for Hepatitis C at baseline. Over the course of the study, both the intervention and control groups exhibited a decrease in needle sharing behaviors. However, the intervention group demonstrated a statistically significant reduction in syringe sharing behaviors compared to the control group.

Limitations

Although the studies included in this review were characterized by strong research design and showed promising results of motivational interventions for treating OUDs, they were not without limitations. The studies varied in terms of sample size, ranging from 32 to 542 participants. As such, some of the smaller studies may have been underpowered to detect statistically significant differences between the MI/MET and control groups. For example, Ober et al. (2023) discussed the possibility that the lack of statistically significant results was related (at least in part) to the study's small sample size. This also raises the question of whether other possible factors apart from sample size have an impact on the results. These may include the characteristics of the samples (e.g., patients with prescription OUD, individuals with injection OUD), the variety of study settings (e.g., hospitals, EDs, methadone clinics, compulsory treatment centers) and the diversity of geographic settings (e.g., China, Republic of Georgia). Specifically, seven out of the 16 studies were conducted outside the United States, which may limit the generalizability of the findings to the U.S. population due to potential cultural differences and varying resources for addressing opioid use problems.

The structure and design of the motivational interventions also varied substantially across studies in terms of the number of sessions (ranging from 1 to 22), length of intervention sessions (ranging from 20 minutes to one hour), and delivery methods. For example, Bohnert et al. (2016) assessed the effectiveness of a single 30-minute motivational session among ED patients at risk for prescription opioid overdose, while Nunes et al. (2006) evaluated a six-month blended motivational intervention among treatment-seeking individuals with heroin use disorder. The variation in intervention design makes it challenging to directly compare results and determine the optimal "dose" and format of MI/MET for effectively addressing OUDs. Several studies examined blended motivational interventions where MI/MET was combined with other treatment components, making it difficult to isolate the specific effects of MI/MET. More research on MI/MET as a standalone intervention would be informative.

The literature on MI/MET interventions also appeared to lack studies that used objective measures of drug use, such as drug test results. Most studies relied on self-reported measures of drug use, which can be subject to recall bias and social desirability bias. Only three of 16 studies utilized objective measures like urine drug tests (Coffin et al. 2017; Nunes et al., 2006; Otaishvili et al., 2012), while two studies utilized both objective and self-reported measures (Gryczynski et al., 2021; Zhong et al., 2015).

Finally, while most studies had follow-up assessments, the follow-up periods ranged from 1 month to 3 years, with several studies finding fading intervention effects over time. Additional long-term follow-up with a greater number of individuals would help assess the durability of the effects of MI/MET on opioid use and related outcomes.

Conclusion

The studies reviewed provided mixed but generally promising evidence for the effectiveness of MI/MET in improving outcomes for individuals with OUD. Several studies found motivational interventions alone or combined with other modalities led to reduced opioid use, better treatment retention, and decreased overdose risk behaviors and events compared to control conditions, at least in the short-term. However, some studies found no significant differences between MI/MET and comparison groups on drug use and other outcomes. It is also noteworthy that 13 out of 16 studies monitored fidelity and found adequate or strong adherence to intended intervention protocols.

The substantial heterogeneity across studies in terms of MI/MET intervention characteristics, study populations, outcome measures, and findings makes it challenging to draw definitive conclusions. More high-quality research with rigorous designs, objective outcome measures, and adequate sample sizes is needed to establish the efficacy of MI/MET for OUD. Future studies should be designed in ways that allow researchers and practitioners to understand the unique or additive effects of MI and MET.

Nonetheless, the current evidence suggests MI/MET is a feasible and potentially effective approach that may enhance motivation, treatment engagement, retention and improve drug use outcomes when incorporated into treatment for OUD. Motivational interviewing is also versatile enough to be integrated with other treatment models and can be applied across various settings. Given the chronic nature of OUDs, MI/MET will likely need to be combined with pharmacotherapy and other psychosocial supports to achieve optimal results. Adaptations of MI/MET to different cultural contexts and specific populations (e.g., hospital patients with prescription OUDs, syringe exchangers, homeless individuals) warrant further study. Despite the

limitations of the existing research, MI/MET is a well-established therapeutic approach that can play an important role in addressing the ongoing opioid epidemic.

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