

Motivational Interviewing Training for Psychiatric Medication Adherence

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I have no known conflict of interest to disclose.

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Abstract

Nonadherence to psychiatric medications was identified as an issue worldwide and in a non-profit organization for women recovering from substance use disorders (SUD) in the southwestern United States. Non-adherence is associated with increased hospitalizations and relapse. A literature review indicated that motivational interviewing (MI) was an evidence-based intervention for increasing psychiatric medication adherence in women recovering from SUD. This project aimed to assess if training the organization staff on MI, would impact their beliefs, knowledge, and comfort of using MI on their clients with non-adherence. The Theory of Planned Behavior is the underlying principle of the project. A recruitment flyer was sent to the organization via email, and interested staff attended the training on the basics of MI via a PowerPoint presentation through video conferencing. Pre-, post-, and one-month follow-up questionnaires were provided to assess participants' knowledge, familiarity, and comfort with MI. The questionnaires consisted of the reliable/validated Beliefs About Medication questionnaire (BMQ) and questions about MI. Participants were deidentified for data collection. A Friedman's test and descriptive statistics were used for analysis. 17 staff participated; five one-month follow-ups were completed. Participants believed medication was more beneficial than harmful and necessary for improvement-nonsignificant: Friedman test $p = .179$. Upon follow-up, 40% reported being comfortable using MI while 60% reported they had not used MI yet. MI training may improve staff comfort and ability to address medication nonadherence. A larger sample may lead to significant and generalizable results.

Motivational Interviewing Training to Increase Psychiatric Medication Adherence in Women Recovering from Substance Abuse Disorders

Throughout the nation, poor psychiatric medication adherence (MA) is a common issue in women with mental health issues. Women with substance use disorders (SUD) face an additional challenge with remaining adherent to their psychiatric medication regimen. The severity of the patient's comorbid mental disorders, treatment education, and willingness to adhere may also affect their adherence rate. Within the context of this paper, the term psychiatric medication will be used separately from medication-assisted treatment (MAT) for SUD. Evidence-based interventions may help combat the issue of medication non-adherence (MN).

Problem Statement

The terms adherence and compliance are often used interchangeably. Due to the negative connotation associated with the word compliance, the term adherence is more widely used in the United States (US). Vrijens et al. (2012) define MA as the process of patients taking medication as prescribed. MN has been identified as an issue across all healthcare populations in the US and internationally. In the state of Arizona, MN continues to be an issue that is associated with poor health outcomes, increased health costs, increased risk for relapse, and re-hospitalization (Substance Abuse and Mental Health Services Administration [SAMHSA], 2019). Kleinsinger (2018) explains that an estimated 125,000 avoidable deaths each year and over \$100 billion annually in preventable healthcare costs are attributed to MN. The large impact of non-adherence is a preventable public health issue (Zullig et al., 2018). The World Health Organization (WHO, 2003) identified MN for chronic illnesses as a massive problem, including psychiatric disorders such as depression. Since then, the issue has increased drastically, as predicted by the WHO.

MA rates vary amongst different mental disorders and genders. MN is particularly concerning in females due to its potential effects on population health outcomes. For example, in many cases, women fear taking their medication during pregnancy. Yet Creeley and Denton (2019) explain for most mental illnesses, the risk of going without medication equals or even exceeds that associated with psychoactive drugs and puts both the mother and fetus at risk. Desai and Nayak (2019) found that females with schizophrenia had higher MN rates. Individuals with psychosis, bipolar disorder, or who are severely mentally ill (SMI) often have higher non-adherence rates. According to one of the landmark dual-diagnosis studies Magura et al. (2011) non-adherence ranges between 28% - 52% for major depressive disorder, 20%-50% for bipolar disorder, and 20% - 72% for schizophrenia. SUD is often associated with lower psychiatric MA rates among psychiatric patients. Identifying and addressing potential non-adherence and substance use is vital because poor adherence is associated with relapse and re-hospitalization (Magura et al., 2011). MA is especially difficult to ensure in those with comorbidities, who take multiple medications to manage their conditions (While, 2020). This includes patients with any mental illness (AMI) co-occurring with SUD. Consequently, patients with mental illness co-occurring with a SUD are at an increased risk for non-adherence and potential relapse.

Purpose and Rationale

SAMHSA (2020) defines SUD as the recurrent use of alcohol or drugs leading to significant impairment. This can include health problems, and failure to fulfill responsibilities. Considering the implications of living with a SUD, and how it may affect MA encouraging sobriety in patients is of utmost importance. MN can be costly and hazardous. If an individual is not adhering to their medication regimen, they are not receiving the optimal benefits of treatment, which can lead to exacerbated symptoms and increased illness. Because of this

problem, it is important to address appropriate ways to decrease MN rates in all affected populations including women. The purpose of this paper is to discuss interventions used to combat MN, and how they were utilized at an organization as best practice for addressing psychiatric MN in women recovering from substance abuse.

Background and Significance

Non-adherence can be intentional or non-intentional, and many factors affect an individual's adherence to a medication regimen (Gast & Mathes, 2019; While, 2020). Several identified causes of MN include patient forgetfulness, misunderstanding of the potential benefits of the medication, and the patient-provider relationship (Gast & Mathes, 2019). Lastly, the cost of medication treatment can affect a patient's ability to remain adherent. In an article by Bhuyan et al. (2018), the authors concluded that women are more likely than men to be nonadherent due to medication costs. Yet, most guidelines for chronic conditions use generic medications at reasonable prices (Kleinsinger, 2018).

Women Recovering from SUD

In a systematic review and meta-analysis, Semahegn et al. (2020) observed that women with SUD are at risk for MN. Women who are living through recovery are a unique population due to their risk for pregnancy and breastfeeding. SAMHSA (2019) reports that 5.8% of pregnant women used an illicit drug in 2019. Peripartum substance use can have harmful effects on both babies and mothers. In addition, substance use can cause other medical illnesses such as heart disease and hormonal abnormalities (National Institute on Drug Abuse [NIDA] 2020, 2021).

According to SAMHSA (2018), substance use is more frequent among adult women 18 years and older with mental illness. The data shows 34.9% of women with AMI and 46.5% with SMI abuse illicit drugs (SAMHSA, 2019). In 2018, 8.9 % of women ages 18-25 abused alcohol,

and 3.4% in ages 26 and up (SAMHSA, 2018). Overall, 89.9% of women with co-occurring SUD and AMI receive no treatment (SAMHSA, 2019). Women with mental illness are likely to have a co-occurring SUD, so maintaining a proper psychiatric medication regimen is important in decreasing the risk of substance use relapse and harm to fetuses in peripartum women.

Promising Adherence Improvement Methods

Psychoeducation, cognitive behavioral therapy (CBT), and motivational interviewing (MI) have all been deemed beneficial in promoting psychiatric medication adherence. MI is a patient-centered conversational method for enhancing motivation to change by exploring and resolving ambivalence (Ehret & Wang, 2013; Xu et al., 2020). In a randomized control trial, Pakpour et al. (2017) found that MI and psychoeducation improved MA rates in their intervention group. Hamrin and Iennaco (2017) found similar results in their quasi-experimental study, where MI yielded increased MA in adolescents. According to Ehret and Wang (2013), when techniques used to promote changes in behavior, skills, and attitudes are used, an increase in adherence has been seen.

Psychiatric Medication Adherence Outcomes

Non-adherence is costly for healthcare organizations, through wastage and decreased health. Non-adherence is associated with higher rates of hospital admissions and poor health outcomes. There are also risks for increased morbidity, mortality, health care costs, and risk for relapse (Jawad, 2018; Lab & Fresco, 2015; Neiman et al., 2017). Based on a review of literature, if psychiatric MA rates are increased in women recovering from SUD through appropriate interventions, organizations and healthcare systems could avoid unnecessary costs and promote patient health. This also posits that if patients are adherent, they are at a decreased risk for

substance use relapse which would further promote optimal health and improve system outcomes.

Non-adherence to psychiatric medication leads to poor patient health outcomes which in turn is a burden on health systems due to increased cost and redirection for the allocation of resources. Considering the various causes of MN in people with AMI and a comorbid SUD, it is vital to modify interventions to fit the patient's needs. Patient-specific interventions such as MI have shown significant benefits in many psychiatric populations and may be used to decrease psychiatric non-adherence rates in women recovering from substance abuse.

Internal Data

The issue of poor psychiatric MA was identified in a non-profit organization located in a major city in the Southwest region of the US. Its focus is on assisting women who are recovering from various SUDs. The organization has housing where the women and their children may be residents for several years. During their time at this facility, the women are engaged in programs and groups that teach them life skills and therapy. In addition, the organization has general psychiatric services offered on-site. Most of the women receive government assistance, including food assistance, and Medicaid insurance. Therefore, the cost of medication treatment for these patients is not a primary cause of non-adherence because it is primarily covered by insurance. The psychiatric nurse practitioner, integrated health coaches, and the counselor all reported the issue of non-adherence. It was mentioned that some of the women stop taking their psychiatric medications because they are working on obtaining custody of their children from the department of child services (DCS). Their fear is DCS will think they are incompetent to have a child if they are on psychiatric medication. This is an example of miseducation of the medication's purpose and its effects on life functioning. The providers also mentioned that the

women tend to stop taking their medication if their symptoms decrease, in belief that they no longer need medication because they feel better. This has led to poor mental health prognoses, increased demand for staff and resources. If this issue is not addressed, the clients will endure prolonged stays, increased risk for relapse, and poor integration into independent life. Lastly, the organization will have to redirect resources to increase psychiatric treatment, and risk increased financial burden.

PICOT Question

A review of the literature led to the clinically relevant PICOT question: For women undergoing substance abuse recovery, how does MI, compared to no MI, affect psychiatric MA? The components of this question guided the literature search that yielded the studies provided.

Synthesis of Evidence

To ensure the quality of the evidence found, a rapid critical appraisal (RCA) was conducted for each study with the Melnyk (2019) RCA checklist tool. This provided a safeguard to make certain the results were relevant and valid. Specific checklists for RCTs, qualitative studies, and cohort studies were used to appraise study designs, their methods, application to practice, and results. Upon critical appraisal and thorough evaluation, it was found that the literature review provided strong evidence.

As shown in appendix A, the studies were diverse, yielding different views and concepts on the topic's variables and outcomes. Yet, the various studies all reported significant results that were similar in content. Though the conceptual frameworks varied, all the studies had the same purpose of assessing the effects of MI-based interventions or similar patient communication methods on MA (see Table A1 and Table A2). Studies focused both on adolescents and adults which provided a broad idea of population-based interventions. Several studies were not limited

to psychiatric MA, but still endorsed the concept of MI related interventions. Most studies assess multiple dependent variables (DV) including MA and health beliefs about medication and illness as shown in Table A3. All of the studies were non-invasive, though a few measured MA with serum drug levels. The primary settings of most of the studies were outpatient, and those results were still conclusive with the other studies in different settings.

Upon thorough review it was found that motivational interviewing (MI) was deemed effective in combating MN in various populations. A significant component of the studies reviewed was training clinicians on MI before they utilized MI as an intervention. This led to the evaluation question, does training staff on MI increase staff familiarity and comfort levels, to address MA issues in women recovering from substance abuse disorders at a non-profit organization for women recovering from substance use disorders? Therefore, the evidence-based practice (EBP) project intervention was to train staff on MI at the project site.

Theoretical Framework

Several themes were implicitly and explicitly stated in the literature review. This includes health beliefs about drugs and illness, social support, and willingness and readiness for change. Additionally, factors that were reviewed in the studies included an individual's mental and physical ability to engage in actions. Collectively, these themes relate to the Theory of Planned Behavior (TPB), developed by Ajzen (1991) which can be summarized into several main concepts. The first is an individual's *behavioral intention*, which is the perceived likelihood of whether one will carry out an action. The second is *attitude*, defined as feelings and beliefs about a behavior. The third is *subjective norm*, which is how others in society may perceive this behavior. Lastly, *perceived behavioral control* is explained as an individual's belief that they have control over their actions.

In summary, the theory posits that an individual is likely to carry out an action based on their beliefs, motivation, societal standards, and individual control. This theory is a collective basis of MI which is based on directive self-change of behavior and actions. This counseling method is rooted in assessing an individual's ambivalence and readiness for change. The themes outlined in the theory are the foundational framework for the project that will be implemented at the non-profit organization for women. The assessment of one's beliefs about potential behavior modifications, and factors that can affect this are core parts of the intervention that will be implemented. This is why health beliefs is one of the variables that will be assessed.

Implementation Framework

Implementation of evidence-based practice (EBP) requires a substantiated systemic approach. The Rosswurm and Larrabee (1999) model consist of six steps that not only lead to the implementation of a practice, but also to maintenance. Step one is the assessment phase; during this stage, collaboration with stakeholders is vital. Upon assessment, it was identified that the clients in the organization had low MA rates. This issue was compared to local and national data and was confirmed to be a substantial issue.

Step two linked outcomes to potential interventions, which was then followed by step three which was synthesizing the evidence found. Increased MA rates were linked to various counseling methods, such as psychotherapy and MI. A literature review helped corroborate the evidence that showed MI to be an appropriate intervention for the issue of psychiatric MN. During this phase an assessment of the feasibility, risk, and benefits was completed to decide if the intervention is appropriate for the setting, population, and organization.

Step four involved designing the practice change; this was the planning phase which included identifying the needed resources and defining outcomes. Step five required

implementation and evaluation of the intervention and its effects on the variables and organization. Upon completion, a decision was made to keep the practice change. The final stage was integration and maintenance; this stage is vital for the organization because it allows for the sustainability of the practice change. At this point, the significance of the practice change findings were communicated with the stakeholders, as well as how to integrate the change into the organization's standard practice.

A logic model was used to assist in the planning and design of the project (See appendix D, figure 1). The intervention of MI training was linked to the short-term outcome of increased staff comfort with MI, as well as the long-term outcome of sustainable interventions for addressing psychiatric MN at the organization. After implementation and evaluation, a joint decision was made to determine if MI training should become a part of standard staff training at the organization.

Methods

A discussion with the PMHNP and clinical director of the organization revealed that none of the case managers, peer supports, or integrated health coaches are trained on MI. The aim of this project was to assess if training staff on MI increases staff comfort levels, and familiarity to address MA issues in women recovering from substance abuse disorders at the local organization.

Participants and Recruitment

A digital flyer was created for recruitment. This recruitment flyer was sent to the clinical director and peer support manager to be distributed to the staff by email for recruitment. The flyer included details about participating in a project led by an Arizona State University (ASU)

doctoral student that consist of MI training, the training dates, and the doctoral student's contact information.

The project participants consisted of the organization's peer supports, integrated health coaches, and case managers. These are the staff who work at a constant direct service level with the organization's clients and consequently are appropriate to be trained on MI. To be qualified for inclusion, participants had to be 18 years or older, competent to consent for themselves, and be able to read and write in English. The presentation and all training material were provided only in English, with no translated material. To limit the need for adaptive training material, individuals with impairing clinically diagnosed learning disabilities were excluded from participation.

The participant consent forms described the purpose of the doctoral project, who the investigators were, confidentiality, and how the de-identified data was to be shared. In addition, it explained that participation was voluntary, and therefore participants could withdraw at any time with no negative consequences or retaliation. Participants consented to participation digitally via Qualtrics.

The project began with a pre-assessment. The participants were given a self-reporting questionnaire that assessed their health beliefs, familiarity with MI, and comfort levels with using MI. The tool consisted of an eight-question questionnaire that measured each participants' general beliefs about medicine on a five-point Likert scale. Additionally, the pre-assessment contained a four-question quiz to assess familiarity with MI, followed by three self-reporting questions that measured comfort on a five-point Likert scale. After the pre-assessment, the staff was trained on MI with the use of a detailed one-hour long PowerPoint presentation created by the presenter. The PowerPoint presentation included an introductory training to MI: The purpose

of MI, the spirit of MI, the processes of MI, core skills, stages of change, and how to apply MI to the organization setting and clients related to MA. The participants had an option to attend one of two virtual days. Upon concluding the training, a post-assessment measured the same variables, which was exactly identical to the pre-assessment tool. Lastly, a one-month follow-up assessment was conducted. This assessment was the same as the pre and post, with an additional question assessing if the participants have utilized any of their MI training. All assessments were provided virtually via Qualtrics for participants.

Institutional review board (IRB) approval for this project was obtained from ASU (See Appendix A). No personal identifiers were used during data collection. Each participant was identified by the first two initials of their mother's name, and the last four digits of their zip code. Virtually collected data was stored in the secure computer software used and was deleted properly upon project completion. This project was intended to be sustainable by leading to all current and incoming peer supports, integrated health coaches, and case managers being trained in MI. The long-term goal of impact is for MI to be a part of the standardized scope and practice for staff, and integrated into organizational policy.

Data Collection and Outcomes Measurement

The participants' health beliefs were assessed with the Beliefs About Medicines Questionnaire (BMQ) by Horne et al. (1999). The BMQ measures individuals' health beliefs in two subscales for a total of four domains: Specific Necessity, Specific Concerns, which assess beliefs about the medication prescribed for personal use, General-Harm, and General-Overuse, which assess beliefs about medication in general. Cronbach's α of the subdomains ranges from 0.59 to 0.8, and Cronbach's α of the total score ranges from 0.66 to 0.7.

Horne et al. (1999) designed the sub-scales to be used together or separately. This project only used the portion of general medicines belief, also known as the BMQ- General. The BMQ- General addresses questions that are not specific to the medication the participant is taking, rather it addresses their overall beliefs about medication. This is appropriate for this project because literature including Horne et al. (1991) explain that people's intention to take medication, or make behavior changes, is often dependent on the beliefs of other people, including their providers. Therefore, it can be assumed it is appropriate to assess participants' general health beliefs related to medications because this can affect their ideas on MI and ways to promote MA. No instruments were found that assess the other variables adequately for this project. Consequently, a self-made tool was created and used to assess familiarity and comfort (See appendix B). The first four questions were adapted from Moyer et al. (2005). These questions assess each participant's understanding of MI and its components. The remaining questions were for the participants to self-report their comfort with addressing medication MN.

Data Analysis and Budget

The data collected from the pre, post, and one-month follow-up were analyzed with Intellectus statistics software using a Friedman Rank Sum Test, additionally descriptive statistics were observed in all domains. No funding was received to complete this project, Qualtrics, Intellectus Statistics Software, and PowerPoint were all provided by ASU. The video conference app that was utilized for the virtual presentations was provided by the project organization.

Results

17 participants attended the training sessions. Some individuals did not complete their post-questionnaires or utilized an invalid deidentification code. Upon completing the one-month follow up the final sample consisted of $n = (5)$ subjects who were organization staff members, a

combination of Integrated Health Coaches, Peer Supports, and Case Managers that completed the pre-, post-, and one-month follow- up phases of the project.

Descriptive Statistics

Descriptive statistics were calculated for Pre-Beliefs About Medication total score (TS), Post Beliefs About Medication TS, Follow-up Beliefs about Medication TS, Pre Overuse Domain TS, Post Overuse Domain TS, Follow-up Overuse Domain TS, Pre General Harm Domain TS, Post General Harm Domain TS, and Follow- up General Harm Domain TS. Pre-Beliefs About Medication TS had an average score of 2.62 ($SD = 0.54$) The scores ranged from 2.12 to 3.25. Post Beliefs About Medication TS had an average score of 2.20 ($SD = 0.66$) The scores ranged from 1.50 to 3.12. Follow-up Beliefs about Medication TS had an average score of 2.35 ($SD = 0.63$) The scores ranged from 1.75 to 3.38. Pre-Overuse Domain TS had an average score of 2.70 ($SD = 0.65$) The scores ranged from 2.00 to 3.50. Post Overuse Domain TS had an average score of 2.25 ($SD = 0.73$) the scores ranged from 1.50 to 3.25. Follow-up Overuse Domain TS had an average score of 2.35 ($SD = 0.68$) The scores ranged from 1.50 to 3.25. Pre-General Harm Domain TS had an average score of 2.55 ($SD = 0.62$) The scores ranged from 1.75 to 3.00. The observations for Post General Harm Domain TS had an average score of 2.15 ($SD = 0.65$) the scores ranged from 1.25 to 3.00. Follow-up General Harm Domain TS had an average score of 2.35 ($SD = 0.65$) The scores ranged from 2.00 to 3.50. The summary statistics can be found in Table 1.

Table 1

Summary Statistics Table for Interval and Ratio Variables

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	Min	Max
Pre-Beliefs About Medication TS	2.62	0.54	5	2.12	3.25
Post Beliefs About Medication TS	2.20	0.66	5	1.50	3.12
FU Beliefs about Medication TS	2.35	0.63	5	1.75	3.38

Pre Overuse Domain TS	2.70	0.65	5	2.00	3.50
Post Overuse Domain TS	2.25	0.73	5	1.50	3.25
FU Overuse Domain TS	2.35	0.68	5	1.50	3.25
Pre General Harm Domain TS	2.55	0.62	5	1.75	3.00
Post General Harm Domain TS	2.15	0.65	5	1.25	3.00
FU General Harm Domain TS	2.35	0.65	5	2.00	3.50

Descriptive statistics were calculated for Pre Knowledge-Familiarity, Post Knowledge Familiarity TS, and Follow-up Knowledge Familiarity TS. Pre Knowledge-Familiarity TS had an average score of 3.60 ($SD = 0.55$) the scores ranged from 3.00 to 4.00. Post Knowledge Familiarity TS had an average score of 3.60 ($SD = 0.55$) the scores ranged from 3.00 to 4.00. Follow-up Knowledge Familiarity TS had an average score of 3.80 ($SD = 0.45$) the scores ranged from 3.00 to 4.00. The summary statistics can be found in Table 2.

Table 2

Summary Statistics Table for Interval and Ratio Variables

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	Min	Max	<i>Mdn</i>
Pre Knowledge Fam TS	3.60	0.55	5	3.00	4.00	4.00
Post_Knowledge Fam TS	3.60	0.55	5	3.00	4.00	4.00
FU_Knowledge Fam TS	3.80	0.45	5	3.00	4.00	4.00

Frequencies and percentages were calculated for Pre-Comfort Addressing, Post Comfort Addressing, Follow-up Comfort Addressing, Pre Comfort Current Knowledge, Post Comfort Current Knowledge, Follow-up Comfort Current Knowledge, Pre Comfort Intent to use, Post Comfort Intent to Use, and Follow-up Comfort Intent Too Use.

Frequencies and Percentages

The most frequently observed category of Pre-Comfort Addressing was disagree ($n = 2$, 40.00%). The most frequently observed categories of Post Comfort Addressing were agree and strongly agree, each with an observed frequency of 2 (40.00%). The most frequently observed

category of Follow-up Comfort Addressing was agree ($n = 2$, 40.00%). The most frequently observed category of Pre-Comfort Current Knowledge was agree ($n = 2$, 40.00%). The most frequently observed categories of Post Comfort Current Knowledge were agree and strongly agree, each with an observed frequency of 2 (40.00%). The most frequently observed category of Follow-up Comfort Current Knowledge was strongly agree ($n = 2$, 40.00%). The most frequently observed categories of Pre-Comfort Intent to use were uncertain and agree, each with an observed frequency of 2 (40.00%). The most frequently observed category of Post Comfort Intent to Use was strongly agree ($n = 3$, 60.00%). The most frequently observed categories of Follow-up Comfort Intent Too Use were uncertain and agree, each with an observed frequency of 2 (40.00%). Frequencies and percentages are presented in Table 3.

Table 3

Frequency Table for Nominal Variables

Variable	<i>n</i>	%
Pre Comfort Addressing		
Disagree	2	40.00
Uncertain	1	20.00
Agree	1	20.00
Strongly Agree	1	20.00
Post Comfort Addressing		
Disagree	1	20.00
Agree	2	40.00
Strongly Agree	2	40.00
FU Comfort Addressing		
Disagree	1	20.00
Uncertain	1	20.00
Agree	2	40.00
Strongly Agree	1	20.00
Pre Comfort Current Knowledge		
Disagree	1	20.00
Uncertain	1	20.00
Agree	2	40.00

Strongly Agree	1	20.00
Post Comfort Current Knowledge		
Disagree	1	20.00
Agree	2	40.00
Strongly Agree	2	40.00
FU Comfort Current Knowledge		
Disagree	1	20.00
Uncertain	1	20.00
Agree	1	20.00
Strongly Agree	2	40.00
Pre Comfort Intent to use		
Uncertain	2	40.00
Agree	2	40.00
Strongly Agree	1	20.00
Post Comfort Intent to Use		
Uncertain	2	40.00
Strongly Agree	3	60.00
FU Comfort Intent Too Use		
Uncertain	2	40.00
Agree	2	40.00
Strongly Agree	1	20.00

Note. Due to rounding errors, percentages may not equal 100%.

One-Month Follow Up

The most frequently observed category of Follow-up Use of MI was No ($n = 3$, 60.00%).

Frequencies and percentages are presented in Table 4.

Table 4

Frequency Table for Nominal Variables

Variable	<i>n</i>	%
FU Use of MI		
Yes	2	40.00
No	3	60.00

Note. Due to rounding errors, percentages may not equal 100%.

Friedman Rank Sum Test

A Friedman rank sum test was conducted to examine whether the medians of Pre-Beliefs About Medication TS, Post Beliefs About Medication TS, and FU Beliefs about Medication TS were equal. The Friedman test is a non-parametric alternative to the repeated measures one-way ANOVA and does not share the ANOVA's distributional assumptions (Conover & Iman, 1981; Zimmerman & Zumbo, 1993).

The results of the Friedman test were not significant based on an alpha value of .05, $\chi^2(2) = 3.44$, $p = .179$, indicating no significant differences in the median values of Pre-Beliefs About Medication TS, Post Beliefs About Medication TS, and FU Beliefs about Meds TS. Table 5 presents the results of the Friedman rank sum test.

Table 5

Friedman Rank Sum Test

Variable	Mean Rank	χ^2	<i>df</i>	<i>p</i>
Pre Beliefs About Medication TS	2.60	3.44	2	.179
Post Beliefs About Medication TS	1.50			
FU Beliefs about Meds TS	1.90			

Summary of Finding and Clinical significance

The Friedman's test was used to analyze the BMQ. Though the finding of the Friedman's test was not statistically significant, there are still clinical implications that are evident. The initial scores of the Beliefs about medications questionnaires were considerably high. Therefore, one can assume that since the scores did not significantly decrease there are still potential benefits in the intervention. The knowledge, familiarity, and comfort portions of the questionnaires had promising results. Knowledge scores remained high and did not drop significantly, yet there is area for improvement to increase the comfort of utilizing MI. Given

these results, it may be beneficial to continue to train clinical staff on MI. They can use the MI skills to address different factors contributing to low adherence in their clients as their comfort improves over time.

Impact and Sustainability

Often times, when there is an issue, the organization attempts to target the clients directly which tends to result in no improvement or delayed responses. The site leads and organization leadership reported that this was the first time this issue has been addressed in an educational manner targeting staff members, to improve their ability to address the issue with their clients. Despite statistical findings, the organization expressed interest in maintaining this intervention. Several of the participants expressed appreciation in the intervention. The organization kindly asked for this intervention to be sustained through the form of a recorded video training. An agreement was made to create a recorded video of the MI training including the same PowerPoint presentation for the organization to use, moving forward with all their clinical staff. The organization believed that the intervention was beneficial and had potential to be used as a formal training to help the staff address medication NA.

Discussion

Similar studies have been conducted to address staff responses to MI training. In a study conducted by Cronk et al. (2012), staff received three training sessions in MI and monthly individual coaching sessions with a MI trainer for three months. Staff then completed questionnaires and participated in a focus group discussion. Cronk et al. (2012) stated staff reported liking the MI skills they learned and finding them useful; however, staff reported disagreement with statements indicating they used MI skills effectively regularly. These results

are similar to the project results in that participants endorsed comfort and familiarity with MI, but the majority had not utilized MI by the one-month follow-up.

The project had several strengths and barriers that should be considered for future studies. The virtual trainings were offered on two different days during scheduled staff meetings. This allowed an increase in attendance since the staff did not have to find time outside of their schedule to attend, and they had two different date options. The participants were able to attend from any location since the training was provided virtually, this decreased the potential of travel being an issue. The small sample size was a limitation, the initial assessment had 17 participants. Yet, due to one-month follow-up attrition, the final sample size was limited to five participants. Future studies should further analyze the MA rates at the organization after the staff have been trained on MI to assess if their new skill set can directly affect MA rates.

Conclusion

This project is an example of how a step-by-step approach and implementation model can help identify an issue and utilize best practice methods to assess the potential benefits of an intervention. The issue of low medication adherence has affected many populations around the world, specifically women who are still recovering from substance use disorders. This can lead to an abundance of issue for the women directly on our health systems. An organization reported this issue with their clients which is well equipped with direct care clinical staff. Based on previous literature, the staff were trained on MI methods for MA to see if this may improve their knowledge, comfort, familiarity of MI and beliefs about medication. The sample population was small with non-significant statistical implications, yet the clinical implications showed benefits for increasing staff's ability to use MI to address NA issues in their clients.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Beebe, L., Smith, K., & Phillips, C. (2017). Effect of a telephone intervention on measures of psychiatric and nonpsychiatric medication adherence in outpatients with schizophrenia spectrum disorders. *Journal of Psychosocial Nursing and Mental Health Services.*, 55(1), 29–36. <https://doi.org/10.3928/02793695-20170119-04>
- Bhuyan, S. S., Shiyanbola, O., Deka, P., Isehunwa, O. O., Chandak, A., Huang, S., Wang, Y., Bhatt, J., Ning, L., Lin, W. J., Wyant, D., Kedia, S., & Chang, C. F. (2018). The role of gender in cost-related medication nonadherence among patients with diabetes. *Journal of the American Board of Family Medicine: JABFM*, 31(5), 743–751. <https://doi.org/10.3122/jabfm.2018.05.180039>
- Conover, W. J., & Iman, R. L. (1981). Rank transformations as a bridge between parametric and nonparametric statistics. *The American Statistician*, 35(3), 124-129. <https://doi.org/10.1080/00031305.1981.10479327>
- Creeley, C. E., & Denton, L. K. (2019). Use of prescribed psychotropics during pregnancy: A systematic review of pregnancy, neonatal, and childhood outcomes. *Brain Sciences*, 9(9), 235. <https://doi.org/10.3390/brainsci9090235>
- Cronk, N. J., Russell, C. L., Knowles, N., Matteson, M., Peace, L., & Ponferrada, L. (2012). Acceptability of motivational interviewing among hemodialysis clinic staff: A Pilot study. *Nephrology Nursing Journal*, 39(5), 385–391.
- Desai, R., & Nayak, R. (2019). Effects of medication nonadherence and comorbidity on health

- resource utilization in schizophrenia. *Journal of Managed Care & Specialty Pharmacy*, 25(1), 37-44. <https://doi/10.18553/jmcp.2019.25.1.037>
- Ehret, M. J., & Wang, M. (2013). How to increase medication adherence: What works? *Mental Health Clinician*, 2(8), 230–232. <https://doi.org/10.9740/mhc.n132973>
- Ertem, M. Y., & Duman, Z. Ç. (2019). The effect of motivational interviews on treatment adherence and insight levels of patients with schizophrenia: A randomized controlled study. *Perspectives in Psychiatric Care*, 55(1), 75-86. <http://dx.doi.org/10.1111/ppc.12301>
- Gast, A., Mathes, T. (2019). Medication adherence influencing factors—an (updated) overview of systematic reviews. *Syst Rev* 8, 112. <https://doi.org/10.1186/s13643-019-1014-8>
- Goldstein, T. R., Krantz, M. L., Fersch-Podrat, R. K., Hotkowski, N. J., Merranko, J., Sobel, L., Douaihy, A. (2020). A brief motivational intervention for enhancing medication adherence for adolescents with bipolar disorder: A pilot randomized trial. *Journal of Affective Disorders*, 265, 1–9. <https://doi.org/10.1016/j.jad.2020.01.015>
- Hamrin, V., & Iennaco, J. D. (2017). Evaluation of motivational interviewing to improve psychotropic medication adherence in adolescents. *Journal of Child and Adolescent Psychopharmacology*, 27(2), 148-159. <http://dx.doi.org/10.1089/cap.2015.0187>
- Hughes, F., Vess, J., & Johnson, E. (2018). Increase adherence to psychotropic medication through motivational adherence therapy: A quality improvement project. *Issues in Mental Health Nursing*, 39(8), 709–713. <https://doi-org/10.1080/01612840.2018.1455118>
- Intellectus Statistics [Online computer software]. (2022). Intellectus Statistics. <https://analyze.intellectusstatistics.com/>
- Jawad, Watson, S., Haddad, P. M., Talbot, P. S., & McAllister-Williams, R. H. (2018).

- Medication nonadherence in bipolar disorder: A narrative review. *Therapeutic Advances in Psychopharmacology*, 8(12), 349–363. <https://doi.org/10.1177/2045125318804364>
- Kleinsinger, F. (2018). The unmet challenge of medication nonadherence. *The Permanente Journal*, 22, 18–033. <https://doi-org/10.7812/TPP/18-033>
- Lam, W. Y., & Fresco, P. (2015). Medication adherence measures: An overview. *BioMed Research International*, 2015, 217047. <https://doi.org/10.1155/2015/217047>
- Magura, S., Rosenblum, A., & Fong, C. (2011). Factors associated with medication adherence among psychiatric outpatients at substance abuse risk. *The Open Addiction Journal*, 4, 58–64. <https://doi.org/10.2174/1874941001104010058>
- Maki, K. G., & Harris, K. A. (2021). Communication strategies to improve medication adherence: A systematic review of literature. *Review of Communication Research*, 9, 167-192. <https://doi.org/10.12840/ISSN.2255-4165.029>
- Marrero, R. J., Fumero, A., de Miguel, A., & Peñate, W. (2020). Psychological factors involved in psychopharmacological medication adherence in mental health patients: A systematic review. *Patient Education & Counseling*, 103(10), 2116–2131. <https://doi-org/10.1016/j.pec.2020.04.030>
- Melnyk, B.M., & Fineout-Overholt, E. (2019). Evidence-based practice in nursing and healthcare: A guide to best practice (4th ed.). Lippincott, Williams & Wilkins.
- National Institute on Drug Abuse. (2020). *Substance use in women drug facts*. <https://nida.nih.gov/publications/drugfacts/substance-use-in-women>
- National Institute on Drug Abuse. (2021). *Substance use in women research report summary*. <https://nida.nih.gov/publications/research-reports/substance-use-in-women/summary>
- Neiman, A. B., Ruppar, T., Ho, M., Garber, L., Weidle, P. J., Hong, Y., George, M. G., &

- Thorpe, P. G. (2017). CDC grand rounds: Improving medication adherence for chronic disease management — innovations and opportunities. *MMWR. Morbidity and Mortality Weekly Report*, 66(45), 1248–1251. <https://doi.org/10.15585/mmwr.mm6645a2>
- Pakpour, A. H., Modabbernia, A., Lin, C. Y., Saffari, M., Ahmadzad Asl, M., & Webb, T. L. (2017). Promoting medication adherence among patients with bipolar disorder: A multicenter randomized controlled trial of a multifaceted intervention. *Psychological Medicine*, 47(14), 2528–2539 <https://doi-org/10.1017/S003329171700109X>
- Rosswurm, M. A., & Larrabee, J. H. (1999). A model for change to evidence-based practice. *Image-the journal of nursing scholarship*, 31(4), 317–322. <https://doi.org/10.1111/j.1547-5069.1999.tb00510.x>
- Semahegn, A., Torpey, K., Manu, A., Assefa, N., Tesfaye, G., & Ankomah, A. (2020). Psychotropic medication non-adherence and its associated factors among patients with major psychiatric disorders: a systematic review and meta-analysis. *Systematic Reviews*, 9(1), 17. <https://doi.org/10.1186/s13643-020-1274-3>
- Steinkamp, J. M., Goldblatt, N., Borodovsky, J. T., LaVertu, A., Kronish, I. M., Marsch, L. A., & Schuman-Olivier, Z. (2019). Technological interventions for medication adherence in adult mental health and substance use disorders: A systematic review. *JMIR mental health*, 6(3), e12493. <https://doi-org/10.2196/12493>
- Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. (2018). *National survey on drug use and health 2018* (NSDUH-2018). https://www.samhsa.gov/data/sites/default/files/reports/rpt23250/5_Women_2020_01_14.pdf
- Substance Abuse and Mental Health Services Administration, Center for Behavioral Health

- Statistics and Quality. (2019). *National survey on drug use and health 2019* (NSDUH-2019). <https://www.samhsa.gov/data/sites/default/files/reports/rpt31102/2019NSDUH-Women/Women%202019%20NSDUH.pdf>
- Substance Abuse and Mental Health Services Administration. (2020). *Mental Health and Substance use Disorders*.
<https://www.samhsa.gov/findhelp/disorders#:~:text=Substance%20use%20disorders%20occur%20when,work%2C%20school%2C%20or%20home>.
- Vrijens, B., De Geest, S., Hughes, D. A., Przemyslaw, K., Demonceau, J., Ruppar, T., Dobbels, F., Fargher, E., Morrison, V., Lewek, P., Matyjaszczyk, M., Mshelia, C., Clyne, W., Aronson, J. K., Urquhart, J., & ABC Project Team. (2012). A new taxonomy for describing and defining adherence to medications. *British Journal of Clinical Pharmacology*, 73(5), 691–705. <https://doi.org/10.1111/j.1365-2125.2012.04167.x>
- While, A. (2020). Medication adherence: Understanding the issues and finding solutions. *British Journal of Community Nursing*, 25(10), 474–479.
<https://doi.org/10.12968/bjcn.2020.25.10.474>
- World Health Organization. (2003). Adherence to long term therapies: Evidence for action.
https://www.who.int/chp/knowledge/publications/adherence_full_report.pdf
- Xia, X. S., Poremski, D., Ubana, R. L., & Ravichandran, N. (2020). Promoting medication adherence among psychiatric patients with a history of nonadherence: A clinical practice improvement program. *Journal of Psychiatric Practice*, 26(4), 284–293.
<https://doi-org/10.1097/PRA.0000000000000482>
- Xu, S., Liu, B., & Zhang, Y. (2020). Effectiveness of mental therapy for poor medication

adherence in depression: A review. *Tropical Journal of Pharmaceutical Research*, 19(8), 1785–1792. <https://doi.org/10.4314/tjpr.v19i8.30>

Zullig, L. L., Blalock, D. V., Dougherty, S., Henderson, R., Ha, C. C., Oakes, M. M., & Bosworth, H. B. (2018). The new landscape of medication adherence improvement: Where population health science meets precision medicine. *Patient Preference and Adherence*, 12, 1225–1230. <https://doi.org/10.2147/PPA.S165404>

Zimmerman, D. W., & Zumbo, B. D. (1993). Relative power of the Wilcoxon test, the Friedman test, and repeated-measures ANOVA on ranks. *The Journal of Experimental Education*, 62(1), 75-86.

Appendix A

Table A1

Budget for DNP Project: Motivational Interviewing Training to Increase Medication Adherence Rates.

Phase	Activities	Cost	subtotal	Total
Preparation	Design participant recruitment material on Canva software. There is a free version, but the budget here is in case the free options does not provide some resources that are needed.	\$100		
	Create PowerPoint slideshow Presentation on Motivational Interviewing. This should be free, but a budget is being set for any unplanned cost associated with creating the presentation	\$100		
	Design pre and post virtual assessments, as well as one month follow up assessment using Qualtrics software. Qualtrics has a free option. But a budget is being set for their additional components if needed.	\$100	\$300	
Delivery	Gas/transportation to project site and back	\$50		

	Blue Jeans video Presentation for the virtual presentation The organization's Blue Jeans Video app which is already paid for by the organization approximately \$200 a year	\$200		
	Participant payments	\$0	\$250	
Evaluation	Email reminder to the staff and project champion for one-month follow-up assessment	\$0		
	Review and analysis of results through Intellectus and SPSS software	\$200	\$200	\$1150

Budget Justification: The following is a justification of the items budgeted for this project and funds request.

Preparation: Many of the items that may be used in the phase should be free or have already been paid for through Arizona State University. As a contingency measure, \$200 has been allocated to the budgeted of those items.

Delivery: The presentations will be virtual through Blue Jeans. As stated above Blue Jeans is free through the Project site, and it should be for all participants based on this.

Evaluation: The one-month follow-up assessment will be distributed virtually with Qualtrics via Email. Reminders will be sent out. There should be no cost associated with this. The use of Intellectus and SPSS software should be free for Graduate students through ASU. A \$200 budget is being allocated in case additional software/support is needed.

Design and print: Creation and Distribution of participant recruitment forms will remain virtual to minimize cost.

The intervention will take place during staffing/training hours. No additional cost should be expected from the project site. Using free software such as Canva, Qualtrics, Blue Jeans, and Intellectus should save cost for both the presenter and project site.

Table A2*Project Timeline*

Project Timeline	
Assessment phase	Already completed Jan 2022- May 2022
Links outcomes to potential interventions	Already completed Jan 2022- May, additional reviews were completed from May-June 2022
Synthesizing evidence found	Completed from Jan 2022- June 2022
Designing the practice change	May 2022- June 2022, initial phase, meet with stake holders, obtain approval on each step of plan. July 2022, create MI PowerPoint that will be presented to participants (5 days). Create consent forms (2 days). Create assessment instruments (2 days, already completed) Create the pre and post assessments on Qualtrics (5 days). IRB approval obtained 7/2022
Implementation and evaluation	Implementation of assessing staff familiarity and comfort with MI in addition to learning MI (2 days). Pre- and post- assessments will take place the day of trainings. 1 month follow up assessments will be sent out (1 day).
Integration and Maintenance	Based on the follow-up questionnaire results, ensuring staff are familiar and comfortable with MI, and the organization is prepared with adequate information to continue MI related trainings on their own (1 week)

Table A3*IRB Approval*

On 7/25/2022 the ASU IRB reviewed the following protocol:

Type of Review: Initial Study Title: Motivational Interviewing Training to Increase Psychiatric Medication Adherence Rates in Women Recovering From Substance Abuse Disorders

Investigator: Ann Guthery Co-Investigator Princess Darko-Amoako

IRB ID: STUDY00016303 Funding: None Grant Title: None Grant ID: None

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 7/25/2022.

Appendix B

Instrument B1

BMQ-General

I would like to ask you about your personal views about medicines in general. • These are statements other people have made about medicines in general. • Please indicate the extent to which you agree or disagree with them by ticking the appropriate box. • There are no right or wrong answers. I am interested in your personal views. • Please only tick one box per question.

1) Doctors use too many medicines

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

2) People who take medicines should stop their treatment for a while every now and again.

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

3) Most medicines are addictive.

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

4) Natural remedies are safer than medicines

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

5) Medicines do more harm than good.

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

6) All medicines are poisons

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

7) Doctors place too much trust on medicines

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

8) If doctors had more time with patients, they would prescribe fewer medicines.

Strongly agree ☐ agree ☐ uncertain ☐ disagree ☐ strongly disagree ☐

Instrument B2

Comfort and Familiarity with Motivational Interviewing Assessment

1. The MI approach is

- a) completely non-directive
- b) highly authoritarian
- c) directive but client-centered

- d) primarily educational
- e) all of the above

2. Within the MI framework, ambivalence about change on the part of the client is seen as

- a) normal and useful
- b) a major roadblock to change
- c) pathological
- d) irrelevant

3. Within the MI framework, individual client assessment is seen as

- a) a stumbling block to change
- b) an unnecessary distraction since the only effective treatment is already known
- c) a vital part of determining a client's needs
- d) a dehumanizing and authoritarian exercise.

4. Which of the following is NOT an MI-consistent strategy for handling resistance?

- a) simple reflection
- b) amplified reflection
- c) argument
- d) reframe
- e) emphasizing personal control

5. In general I am comfortable addressing psychiatric medication non-adherence in clients

Strongly agree ☐ Agree ☐ Uncertain ☐ Disagree ☐ Strongly disagree ☐

6. With my current knowledge and familiarity of MI, I am comfortable using MI as a tool to assess and address client psychiatric medication non-adherence.

Strongly agree ☐ Agree ☐ Uncertain ☐ Disagree ☐ Strongly disagree ☐

7. I intend to use MI to address psychiatric medication non-adherence rates.

Strongly agree ☐ Agree ☐ Uncertain ☐ Disagree ☐ Strongly disagree ☐

One-Month Follow up Question:

Since the MI training, have you begun using MI to address psychiatric medication adherence?

Yes ☐ No ☐

Appendix C

Evaluation and Synthesis Tables

Table C1

Evaluation Table for Quantitative Studies

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice; Generalization
Ertem et al., (2019), The effect of motivational interviews on treatment adherence and insight levels of patients with schizophrenia: A randomized controlled study Country: Turkey Funding: No external or intramural funding was received Bias: Non recognized	Inferred to the CBT model	Design: RCT Individuals with schizophrenia, with the sample characteristics, were assigned to intervention and control groups according to a randomization schedule Purpose: To examine the effect of MI on treatment adherence and insight of the patients diagnosed with schizophrenia	N= 40 CG: 20 IG:20 Demographics: IG M age 43.20 ±10.54, 70% male, 15% single, 80% unemployed, 85% lived with family CG M age: 40.05±10.87, 50% male, 30% single, 70% unemployed, 75% lived with family. Setting: A university hospital psychiatry outpatient clinic in Turkey Exclusion: History of chronic physical	IV1: MI DV1: MA Levels DV2: Insight Levels Definitions: MI - a form of client-focused counseling to stimulate a behavioral change Adherence - patient's consent to receive and follow health related recommendations Insight - being aware of the illness and its symptoms. Insight into mental illness is assessed from a multidimensional standpoint such as accepting the disease, recognizing the symptoms of the	Tools: SRMMA Validity/ Reliability: ($\alpha = 0.57$) Tools: Schedule for assessing the three components of insight Validity/ Reliability: ($\alpha = 0.86$)	Statistical Tests Used: Independent t-test, Mann–Whitney U- Chi-square test, Friedman's Two-Way test, Post hoc advanced analysis, and intention to treat analysis	DV1: post-MI ($p = 0.001$), third month follow-up ($p < 0.001$) and sixth month ($p < 0.001$) DV2: post-MI ($p = 0.026$), third month follow-up ($p = 0.011$), and lastly sixth month follow-up ($p = 0.002$)	Level of Evidence: Level II – RCT, Low attrition, Noninvasive intervention Strengths: Multiple FU appointments within appropriate time. High level of evidence, low attrition. Weakness: The consistency of Self-Reported Measure of Medication Adherence was low Self-Reported Measure of Medication Adherence was only composed of four generalized questions. Low N. Feasibility: MI can be included in patient visits for treatment with patients. Low cost due to simply requiring training.

Key: α Cronbach's alpha **A** LIFE Adolescent Longitudinal Interval Follow-up Evaluation **B** unstandardized regression coefficient **BARS** Brief adherence rating scale **BMI** Brief Motivational Interventions **BP** Bipolar Disorder **CBT** Cognitive Behavioral Therapy **CG** Control Group **DAI** Drug attitude inventory **DS** databases searched **DV** Dependent Variable **Dx** Diagnosis **EHR** electronic health record **FU** Follow up **HCP** health care provider **IG** Intervention Group **IV** Independent Variable **M** mean **MA** Medication Adherence **MEMS** Medications electronic monitoring system **MI** Motivational Interviewing **MISAT** Motivational Interviewing Style Adherence Therapy **MPR** Medication Possession Rate **N** Number of participants **NIMH** National Institute of Mental Health **NOS** Not otherwise Specified **p** P-value **PDD** Pervasive Development Disorder **PRISMA** Preferred Reporting Items for Systematic Reviews and Meta-Analyses **RCT** Randomized Control Trial **SAMHSA** Substance Abuse and Mental Health Services Administration **SC** Standard Care **SMI** Severe mental illness **SPSRICCT** standardized protocol for Systematic Review and Interventions of the Cochrane Collaboration's tool **SR** Systemic review **SRMMA** Self-Reported Measure of Medication Adherence **SUD** Substance use disorder **TAU** Treatment as usual **TIPS** telephone intervention problem solving **USA** United States of America **VASR** visual analogue self-reporting

			disease, a history of substance use (except caffeine and nicotine), a history of mental delay. Attrition: 1 participant	disease and accepting the treatment				Application: Both the clinicians and patients can benefit from increased levels of treatment adherence and insight by the adoption of the MI methods.
Goldstein et al., (2020), A brief motivational intervention for enhancing medication adherence for adolescents with bipolar disorder: A pilot randomized trial. Country: USA Funding: NIMH Bias: None Recognized	Inferred to CBT model	Design: Pilot RCT of 3 session BMI targeting MA in adolescents with BP. Compared SC versus SC + BMI Purpose: To assess if BMI can affect adolescent MA levels	N: 43 Demographics: ages 12–22 years, M 16 years. 35% male. Settings: University of Pittsburgh Medical outpatient Center Exclusion: Evidence of PDD, not fluent in English, not have a minimum of 3 rd grade education, unable to consent Attrition: 3 participants	IV1: BMI + SC DV1: MA DV2: Mood symptoms Definitions: BMI- 5 staged client centered counseling SC- Pharmacotherapy for psychiatrist MA – Proper self-administration according to MedTracker and self-reporting. Mood Symptoms- Severity of mania, hypomania, depression, psychosis	Tools: A-LIFE psychiatric status ratings 1-6 severity scale Validity/Reliability: Not reported, searched other sources, not found. Tools: MA 1-5 Scale Validity/Reliability: Not reported	Statistical Test Used: Chi-squared, Fisher's exact, and t-tests, Post hoc Power Analysis.	DV1: 67% MA in first month of follow-up, 60% MA remaining follow-ups (F = 21.70, p < 0.0001) DV2: MA was associated with a decrease in depressive symptoms (F = 7.80, p = 0.005) and any mood symptoms (F = 5.50, p = 0.02)	Level of Evidence: Level II RCT, Low attrition, Noninvasive Strengths: Interdisciplinary study, MI trained providers, FU within short time. 1 subjective, 1 objective DV Weakness: Pilot study, potentially underpowered. Validity and reliability of tools not found. Feasibility: BMI can be provided at all patient visits, no additional equipment is needed, is therapy based. Application: Patients, families, & providers can benefit from the outcomes of BMI. Increased adherence may decrease poor mood symptoms.

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Pakpour et al., (2017), Promoting medication adherence among patients with bipolar disorder: A multicenter randomized controlled trial of a multifaceted intervention Country: Iran Funding: None reported Bias: None recognized	Inferred to CBT model	Design: Patients were randomly assigned to IG = MI & psychotherapy or CG = Usual care Purpose: Assess if MI & psychotherapy can affect MA levels in adults with BP	N: 270 Demographics: IG M age- 41.8, 44.8 % males, 61.2 % single CG M age- 41.2, 49.3% male, 58.1% single. Settings: Multiple psychiatric medical centers (10) in different Iranian cities. Exclusions: Dx of borderline personality disorder, SUD, pregnant, unable to consent, intellectual disability, needed an increase or change in meds. Attrition: 16 participants	IV1: MI & Psychotherapy combined DV1: MA levels DV2: Serum drug levels Definitions: MA Levels- patients rating on MA rating scale and beliefs about disorder and medication Serum drug level- blood levels of mood stabilizers (lithium, carbamazepine, valproate) Psychotherapy – included family members MI -patient centered counseling validated by trained clinicians.	Tools: MA rating scale Validity/Reliability: ($\alpha = 0.84$) Tools: Beliefs about Medicines Questionnaire Validity/reliability: Used in other studies, but not reported Tools: Intention to take medication questionnaire Validity/reliability: ($\alpha = 0.91$)	Statistical Test Used: Medication analysis, intent to treat, Benjamini and Hochberg false discover rate, multilevel linear mixed model,	DV1: Increased MA levels ($B=3.15$; $p<0.001$) and 6 months ($B=3.20$; $p<0.001$) DV2: Increased serum levels ($B=0.108$ Lithium, $B=1.53$ Carbamazepine, $B=3.62$ valproate; $p<0.001$)	Level of Evidence: Level II, RCT, non-invasive Strengths: High N, subjective and objective assessment tools, 6-month FU Weakness: Limitation on participant comorbidities, no FU after 6 months Feasibility: Low-cost intervention, but both psychotherapy with family and MI can be costly. Application: Trained clinicians can provide MI and psychotherapy in multiple settings with minimal equipment
Hamrin et al., (2017), Evaluation of motivational interviewing to improve psychotropic medication	Theoretical/conceptual framework: The self-determination theory	Design: Quasi-experimental Purpose: To assess if 2 MA sessions could improve MA rates, assess attitudes towards adherence, and	N: 48 Demographics: Ages 12-18, 17 males, 24 females, M age- 15.6	IV1: MI DV1: MA rates DV2: Drug attitudes/beliefs Definitions:	Tools: NIH Validity/Reliability: Not reported, used in many other studies. Tools: DAI	Statistical test used: Fisher's exact test, McNemar's test, Cochran–Armitage	DV1: 70.7% were taking their medications between 80%-100% of the time, endpoint adherence	Level of evidence: Quasi- experimental Level III, non-invasive Strengths: Authors claim it's the first study assessing MI in adolescents, pre and post assessment

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adherence in adolescents Country: USA Funding: Denied funding Bias: None reported		assess if self-reported MA rates match EMR rates.	Settings: Outpatient University Hospital Exclusions: Illiteracy, current psychosis, and severe self-care deficits, verbal communication deficits Attrition: 7 participants	MI- 2 Clinician led, video recorded MI sessions MA rates- taking meds according to MEMS and EHR timing, dosage, and frequency Drug attitudes/beliefs- positive and negative attitudes toward medication, and illness	Validity/Reliability: Validated in 1983, α = not reported	trend test, chi-squared test, t- tests, paired t- test, f test,	scores - 80.6% ($p < 0.0001$) DV2: Participants with MA above 80% had DAI mean scores of 16.48. Below 80% had a DAI mean of 15.5 ($p = 0.73$)	Weaknesses: 3 patients had 100% adherence at baseline and had no room to improve. Not randomized/controlled, low N Feasibility: Non-invasive, can be done in any setting, all practitioners can be MI trained Application: Providers can implement MI in adolescents and young as 12 years old.
Xia et al., (2020), Promoting medication adherence among psychiatric patients with a history of nonadherence: A clinical practice improvement program. Country: Singapore Funding: None reported Bias: none recognized/reported	Theoretical/conceptual framework: Inferred to CBT model	Design: Non-experimental observational cohort study Purpose: Assess efficacy of psychoeducation and MI on MA in patients with SMI	N: 156 patients Demographics: Men ages 19-60. Settings: Acute psych men's ward Exclusions: intellectual disability, personality disorders, or substance use disorders Attrition: 0 participants	IV1: MI and Psychoeducation DV1: MA DV2: 30-day rehospitalization rate Definitions: MI-Person centered counseling by a trained clinician to assess and guide behavior changes Psychoeducation – therapeutic delivery of education on meds and illness MA- Taking 80% of more of	Tools: VASR scale Validity/Reliability: VASR is part of BARS- ($\alpha = 0.92$)	Statistical test used: single group interrupted time series analysis, logistic regression, sensitivity analysis, Fisher's exact test	DV1: MA increased 33% ($P=0.001$) DV2: decreased from 17- 6 %, $P=0.037$	Level of evidence: Level III, observational design. No attrition, non-invasive Strengths: Both individuals who were adherent at baseline, and NA received the same care (MI + psychoeducation) which was SC. Service provided & patient factors did not change/influence outcomes. Weaknesses: Not experimental, not randomized. Only included males.

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				medication in measured time 30-day rehospitalization rate- Rate at which patients readmitted to the hospital within 30 days of discharge				Feasibility: MI & psychotherapy became SC. All clinicians can be trained to provided MI Application: Can be generalized to females. Since no gender related factors were noted/
Maki et al., (2021), Communication strategies to improve medication adherence: A systematic review of literature Country: USA Funding: MD Anderson cancer support grant Bias: None-reported. Authors receive stipends from Cancer Prevention Research Training Institute	Theoretical/conceptual framework: Inferred to behavioral system model	Design: SR Purpose: Investigate communication strategies that improve MA in several medical conditions	N: 44 articles DS: MEDLINE, PsychARTICLES, Psychology & Behavioral Sciences Collection, PsycINFO, Communication & Mass Media Complete, socINDEX, Health Source Exclusions: No communication strategy, strategy not effective, strategy not delivered by HCP	IV1: Communication strategies (Patient reminders n= 11, collaborative communication n=14, psychoeducation n=15, counseling strategies/MI n = 5) DV1: MA Definitions: Communication strategies- strategy focusing communication by clinician to increase MA MA- Following mutually agreed upon medical regimen	Tools: PRISMA Validity/Reliability: not reported Inter-rater reliability -(Kappa = 0.77)	Statistical test used: None reported	DV1: All indicated positive results, patient education showed highest results	Level of evidence: Level I, SR of 44 articles of different methods, non-invasive Strengths: Studies included adolescents & adults, different health conditions, multidisciplinary interventions, different study methods Weaknesses: Each study defined MA slightly different Feasibility: None invasive, providers can be trained on multidisciplinary communication strategies Application: Study implied different communication strategies implemented by providers can improve MA

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Hughes et al., (2018), Increase adherence to psychotropic medication through motivational adherence therapy: A quality improvement project Country: USA Funding: Center for Mental Health Services- SAMHSA Bias: Funded under SAMHSA	Theoretical/conceptual framework: Johns Hopkins Nursing Evidence-Based Practice Model	Design: Quasi experimental, no randomization, one intervention group no control Purpose: Assess the impact of MISAT on psych MA on SMI patients	N: 19 IG: 19 CG: No control Demographics: age 25 and up Settings: Veteran's Medical Center, outpatient case management program Exclusions: non-veteran, no history of psychosis Attrition: 0 participants	IV1: MISAT DV1: Med refills Definitions: MISAT- Assessment, education and discussion about meds Med refill- Number of med dispensed refills within prescribed timeframe.	Tools: MPR Validity/Reliability: Not reported, used in many MA studies	Statistical test used: Not reported	DV1: Average MPR increased from 82-85%	Level of evidence: Level III, small N, no statistical test reported, limited tools used, non-invasive Strengths: Analyzed age & dx factors with on MPR Weaknesses: Poor measurement of MA, MPR is only objective on refills, not intake. Small N. Feasibility: MISAT can be provided in any setting, by trained providers. Noninvasive. Application: MISAT can help increase MA in individuals with psych MA issues
Beebe et al., (2017), Effect of a telephone intervention on measures of psychiatric and nonpsychiatric medication adherence in outpatients with schizophrenia spectrum disorders. Country: USA	Theoretical/conceptual framework: Theory of planned behavior	Design: RCT- computer-generated random number table for CG- TAU, and IG- TIPS Purpose: Examine effects of telephone communication on MA	N: 185 CG- not reported IG- not reported Demographics: age 19-75, M = 46.8. Male- 56.2%, Caucasian – 67.6%, living with family – 56.2%, Settings: Outpatient community clinic	IV1: Weekly TIPS Quantitative measures of MA DV1: Pill Counting DV2: Serum drug levels Definitions: TIPS- Telephone nursing intervention including knowledge of meds, social support,	Tools: Pill counts Validity/Reliability: Not reported Tools: Serum Medication levels Validity/Reliability: Not reported	Statistical test used: t-test, chi square analysis,	DV1: 68.7% 6-month pill count adherence DV2: 54.7% had therapeutic serum drug levels at 6 month FU (p = 0.023)	Level of evidence: Level II, RCT, non invasive Strengths: Wide age range, objective DVs Weaknesses: High attrition rate, Group sizes not reported Feasibility: requires lab testing for serum drug levels, and pill counting time/accuracy. TIPS is non-invasive and over the phone

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Funding: none reported Bias: none identified			Exclusions: coexisting mental retardation, neurological disorders, head injury Attrition: 80 participants (43%)	appointments, sobriety Pill accountability- Individual pill counting in participants' homes by blinded researcher, proper amount of pills Serum Drug levels- Blood antipsychotic med levels				Application: Telephone interventions can be used to increase MA factors in patients with Schizo spectrum disorders.
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Table C2
Evaluation Table for Qualitative Studies

Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/ Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/ Quality of Evidence; Decision for/ Application to practice; Generalization
Steinkamp et al., (2019), Technological interventions for medication adherence in adult mental health and substance use disorders: A systematic review Country: USA	Data driven conceptual framework & literature guided taxonomic framework	Design: Qualitative SR Method: Reviewed 7 databases for wide range of technological interventions related to psych MA, followed PRISMA guidance	N: 127 articles DS: MEDLINE, EMBASE, PsycINFO, Cochrane, Register of Controlled Trials, Web of Science, Engineering Village, ClinicalTrials.gov	RQ1- data collection components (Patient self-report, care network report, direct visualization, biological sampling, smart pill containers, digital pills, pill counts, drug utilization measurements, collection of related data)	Data Collection: Cochrane Covidence tool Data Dependability: article relevancy at title and abstract & full-text screen. 2 reviewers independently	State type used. Interrater reliability - Cohen kappa	(1) Most assessments and interventions can be used across all psych disorders (2) Some modalities work better when there are multiply interventions (3) Data collection components still need	Level of Evidence: Level I, SR, 7 database searches, 127 articles non-invasive Strengths: Wide range of interventions, focused on psych only, ~ 40% RCTS Weakness: No quantitative component, very wide

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Funding: National Institute on Drug Abuse Bias: Some authors were affiliated or paid by MySafeRx		Purpose: develop taxonomy framework of technology for SUD and psych MA	Demographics: 40.2% RCTs, 56.7% non-randomized interventions Exclusion: Articles that measured adherence to the intervention, didn't measure MA, didn't exclusively study a psych or SUD population, protocol-only articles, financial incentive for MA, pediatric & dementia populations	RQ2- interventional components (adherence reminders, supportive messages, social network interventions, passive education, secure med storage, adherence focused therapy/counseling, contingency management, data feedback, comprehensive mental health care, care team contact) Definitions: 1- components designed to collect data or improve the accuracy of adherence measurement 2- components designed to directly increase medication adherence	screened each abstract and full-text conflicts were resolved via discussion until consensus was reached; a third reviewer available, but not needed due to no conflict (Cohen kappa =0.80, 95% CI 0.72-0.87)		to be addressed according to main nonadherence reason (4) Biological measurements and directly observed ingestion are high adherence but are cost, inconvenient and impractical	range of technological components Feasibility: Interventions such as pill counting and cell reminders are low cost and effective, and may be implemented in many setting Application: There are numerous interventions to promote MA in the psych population, some are more costly/inconvenient, but phone reminders and direct observation have been deemed effective.
Marerro et al., (2020), Psychological factors involved in psychopharmacological medication adherence in mental health patients: A systematic review	Concern-Necessity belief system framework	Design: Qualitative SR Method: Literature review of 4 databases, Followed PRISMA guidance	N: 29 articles DS: Medline, PubMed, PsycINFO, Google Scholar	RQ1- Psychologic factors and MA RQ2- Sociodemographic factors and MA Definitions: 1- Self efficacy, beliefs, attitudes of illness & MA	Data Collection and Data Dependability: Three reviewers screened for eligibility and data extraction. Conflict was discussed and	SPSRICCT STROBE checklist	(1) medication adherence is associated with health beliefs, self-efficacy, control, Family support (2) Comorbidity with substance use has a negative impact on	Level of Evidence: Level I, SR, non-invasive Strengths: Assess multifaceted interventions, high sample N Weakness: No quantitative

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Citation	Theory/ Conceptual Framework	Design/ Method/ Sampling	Sample/ Setting	Major Themes Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/ Quality of Evidence; Decision for/ Application to practice; Generalization
Country: USA Funding: Denied funding Bias: None recognized		Purpose: Identify psychological factors related to psych MA	Demographics: adolescent N- 222, Adults N- 6,139 Exclusion: did not involve primary research, were not available in the online database, were theoretical, dissertations, SR, or meta-analyses, referred to MA in physical health problems, used retrospective data collection, duplicated samples	2- gender, age, race, and educational level	resolved amongst all authors Kappa coefficient reached (.78)		psychopharmacological MA	component, low article number Feasibility: All interventions were non-invasive. Majority were patient centered and accessible in all settings. Application: MA interventions should focus on psychological factors like self-control, and family support

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Table C3*Synthesis Table*

Study (Author, year)	Ertem et al., (2019)	Goldstein et al., (2020)	Pakpour et al., (2017)	Hamrin et al., (2017)	Xia et al., (2020)	Maki et al., (2021)	Hughes et al., (2018)	Beebe et al., (2017)	Steinkamp et al., (2019)	Marerro et al., (2020)
Design	RCT	RCT	RCT	QE	NE OCS	SR	QE	RCT	SR	SR
LOE	Level II	Level II	Level II	Level III	Level III	Level I	Level III	Level II	Level I	Level I
Sample										
<i>n subjects</i>	40	43	270	48	156	-	19	185	-	-
<i>IG M-Age</i>	43.30	16	41.8	15.6	*	-	*	46.8	-	-
<i>Number of articles</i>	-	-	-	-	-	44	-	-	127	29
Setting										
<i>Outpatient</i>	x	x	x	x		x	x	x	x	x
<i>Inpatient</i>					x	x			x	x
Interventions										
<i>MI</i>	x			x		x			x	x
<i>MI + Psychotherapy</i>			x			x				x
<i>BMI + SC</i>		x								
<i>MI + psychoeducation</i>					x	x				
<i>Patient reminders</i>						x			x	
<i>Interdisciplinary communication</i>						x			x	x
<i>MISAT</i>							x			
<i>Weekly TIPS</i>								x		
<i>Pill counting</i>									x	
Outcomes/ Themes										
<i>MA</i>	↑	↑	↑	↑	↑	↑			↑	↑
<i>Drug Beliefs/attitudes</i>			↑	↑					↑	↑
<i>Negative Mood/symptoms</i>		↓								
<i>Serum Drug Levels</i>			↑					↑	↑	
<i>Hospital readmission</i>					↓					
<i>Insight</i>	↑									

Key: **BMI** Brief Motivational Interventions **IG** Intervention Group **LOE** level of evidence **M** Mean **MA** Medication Adherence **MI** Motivational Interviewing **MISAT** Motivation interviewing style adherence therapy **N** Number of participants **NE OCS** Non-experimental observational cohort study **QE** Quasi-experimental **RCT** Randomized Control Trial **SC** Standard care **SR** Systematic review **TIPS** Telephone Intervention Problem Solving ↑ Increased, ↓ Decreased, – Not applicable, * Not reported, x Endorsed

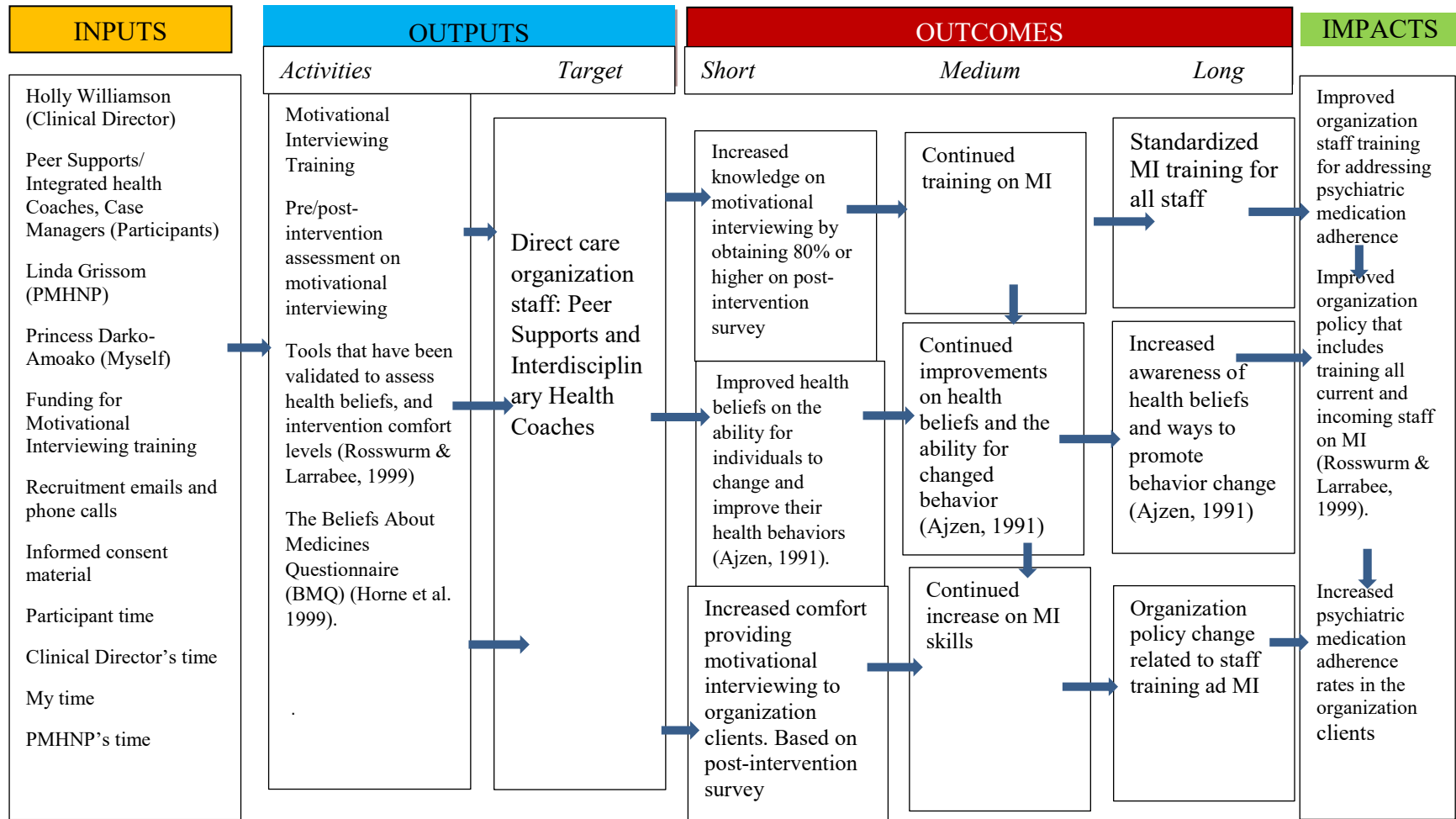
Study (Author, year)	Ertem et al., (2019)	Goldstein et al., (2020)	Pakpour et al., (2017)	Hamrin et al., (2017)	Xia et al., (2020)	Maki et al., (2021)	Hughes et al., (2018)	Beebe et al., (2017)	Steinkamp et al., (2019)	Marerro et al., (2020)
<i>Medication Refills</i>							↑			
<i>Pill accountability</i>								↑	↑	

Key: **BMI** Brief Motivational Interventions **IG** Intervention Group **LOE** level of evidence **M** Mean **MA** Medication Adherence **MI** Motivational Interviewing **MISAT** Motivation interviewing style adherence therapy **N** Number of participants **NE** **OCS** Non-experimental observational cohort study **QE** Quasi-experimental **RCT** Randomized Control Trial **SC** Standard care **SR** Systematic review **TIPS** Telephone Intervention Problem Solving ↑ Increased, ↓ Decreased, – Not applicable, * Not reported, x Endorsed

Appendix D

Figure 1. Motivational Interviewing Training for Psychiatric Medication Adherence Logic Model

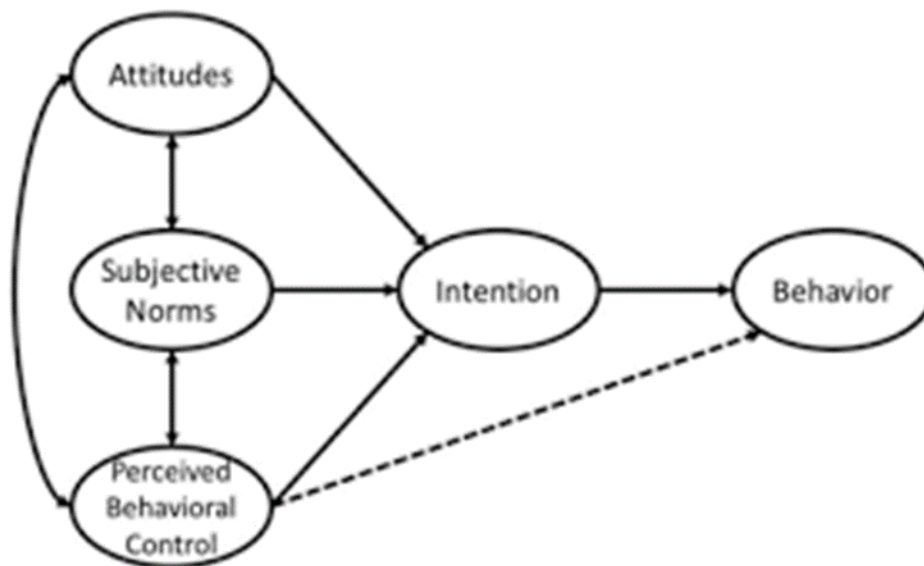
Goals: The purpose of this evidence-based clinical project is to increase motivational interviewing (MI) comfort levels and improve health beliefs in organization staff by training them on MI to address psychiatric medication adherence in women recovering from substance abuse disorders (SUD).



Assumptions: The MI training will increase staff potential to increase psychiatric medication adherence. The staff will be able to provide MI to clients. The staff will feel comfortable providing MI. The staff will feel well trained and skilled in MI. The staff will understand the potential for behavior changes in individuals (Ajzen, 1991). The MI training will be sustainable in the organization leading to long term policy changes (Rosswurm & Larrabee, 1999).

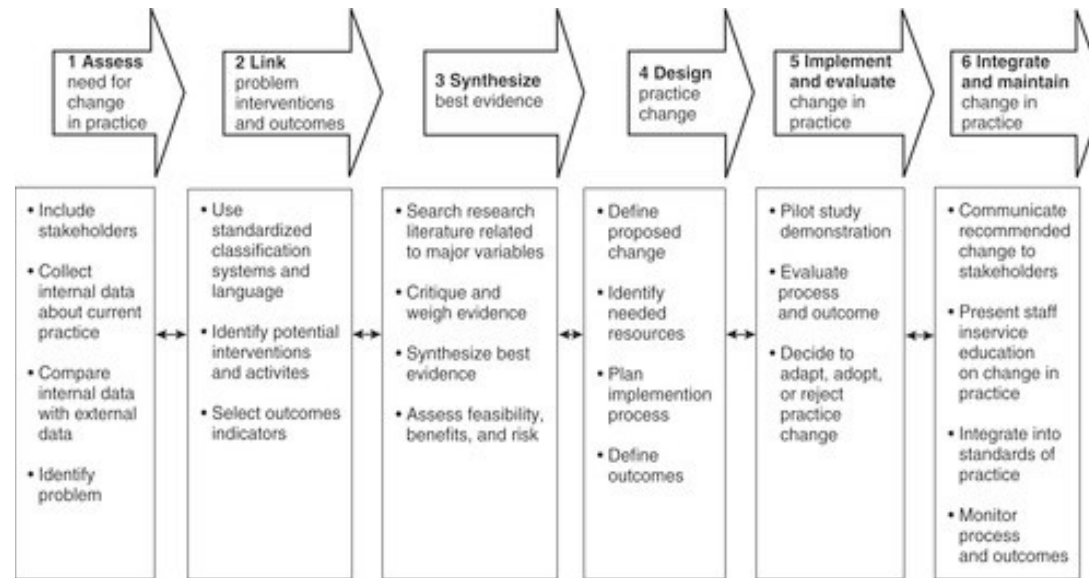
Appendix E
Models and Frameworks

Figure E1
Theory of Planned Behavior



(Ajzen, 1991)

Figure E2
Rosswurm and Larrabee Model



(Rosswurm & Larrabee, 1999)