Improving the Care Transition to Outpatient Aftercare Services Following Addiction Treatment

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Abstract

The chronic nature of substance use disorder requires continuity of care after residential treatment. Only a small proportion of patients, however, adhere to aftercare follow-up plans and the relapse rates remain between 40- 80% within a year post-discharge. Synthesis of evidence showed that facilitated referral (FR) significantly increased follow- up adherence and resulted to positive outcomes. The study aimed to examine the effectiveness of FR in improving access, follow-up adherence and engagement to aftercare services, and relapse rate after a month post-discharge. After the Institutional Review Board approval, 30 participants were recruited in two residential treatment facilities. Questionnaires, the Assessment of Warning Signs of Relapse and Health leads surveys were utilized to collect data. Data were analyzed using descriptive statistics, McNemar, and Wilcoxon signed rank tests. Results showed that FR significantly increased access to many community aftercare services ($p<.05$). A significant reduction in relapse risk post-intervention was also noted ($Z= -3.180$, $p= .001$). Additionally, most participants discharged with scheduled appointments followed-up and had continued engagement with aftercare services. Eight participants maintained sobriety and 18 were lost to follow-up a month post-discharge, while four relapsed in the facility. Overall, FR increased access to needed aftercare services and significantly decreased the relapse percentage risk post-discharge. FR is a promising intervention that can be implemented for practice. Future research is recommended to further examine the correlation with follow-up adherence and continuous engagement to aftercare services, and relapse rate at 30 days after discharge.

Keywords: substance use, residential substance use treatment facility, facilitated referral, care transition, aftercare, healthcare accessibility, follow-up adherence, primary care, mental health services

Improving the Care Transition to Outpatient Aftercare Services Following Addiction Treatment

Substance use disorder (SUD) had been a global concern causing a wide range of direct and indirect medical and social problems (U.S. Department of Health and Human Services, 2016). Apart from causing adverse effects on mental health and doubling the risk of developing chronic illnesses, it can result to fatal health problems that may lead to unexpected deaths (HHS, 2016). Unfortunately, only half of the patients discharged from substance use treatment facilities made initial contact with primary care and outpatient aftercare services despite the chronic relapsing nature of SUDs, and numerous health and social consequences associated with it (Arbour, Hambley, & Ho, 2011; Cucciare, Coleman, Saitz, & Timko, 2014; HHS, 2016; Manuel et al., 2017). Ensuring continuity of care and linkage to aftercare services after completion of treatment could improve the physical health, mental health, and SUD outcomes of this population (Arbour et al., 2011; Chi, Parthasarathy, Mertens, & Weisner, 2011; Cucciare et al., 2014; Lash et al., 2012; Vederhus, Timko, Kristensen, Hjemdahl, & Clausen, 2014). This paper will explore the impact of facilitated referral to the accessibility and follow- up adherence to outpatient aftercare services, and to the relapse rate after discharge from a residential substance use treatment facility.

Problem Statement

Substance misuse continues to be a public health concern affecting millions of people worldwide. In 2012, approximately 3.5% to 7% (162 million to 324 million) of the global population aged 15- 64 used illicit drugs and around 5.9% (3.3 million) of global deaths were associated with alcohol consumption (United Nations Office on Drugs and Crime, 2014; World Health Organization, 2014). Nationally, about 9% (21.5 million) of the U.S. population was diagnosed with SUD costing taxpayers more than $600 billion annually including expenses

associated with crime, health, and lost productivity (HHS, 2016; Substance Abuse and Mental Health Services Administration, 2015b). Statistics further showed that 47,055 Americans died due to drug overdose and 88,000 more deaths resulted from alcohol misuse in 2014 (Rudd, Aleshire, Zibbell, & Gladden, 2016; Stahre, Roeber, Kanny, Brewer, & Zhang, 2014). In Arizona, 3.4% (177,000) of the population aged 12 or older and 6.4% (295,000) aged 21 or older reported illicit drug use and heavy alcohol consumption, respectively (SAMHSA, 2015a).

The associated physical, mental, and social adverse health effects further aggravate this problem. About 7.9 million adults had co-existence of both mental illness and SUD with the highest rates among those aged 26 to 49 (42.7%) (SAMHSA, 2015b). It is also associated with negative social outcomes such as increased risk for driving under influence (DUI), property crimes, deteriorating relationships, poor school and work performance, and loss of employment (HHS, 2016; Thornberry & Krohn, 2006). Several studies also linked SUD with various medical illnesses such as hypertension, cardiopulmonary diseases, stroke, cancer, liver and pancreatic problems, arthritis, chronic pain, diabetes, reproductive system disorders, communicable diseases such as Hepatitis B, Hepatitis C and HIV/AIDS, trauma, sexual assault and rape, and other transportation- related injuries (Cantor et al., 2015; Center for Health Information and Analysis, 2015; HHS, 2016; Jewett, Shults, Banerjee, & Bergen, 2015; Scott et al., 2016).

Despite its negative health and economic impact, only 1% (2.6 million) of individuals diagnosed with SUD underwent treatment at specialized facilities in 2014 (Han, Hedden, Lipari, Copello, & Kroutil, 2015). Of those who completed the treatment, the relapse rate was estimated to be between 40% and 60% (National Institute on Drug Abuse, 2014). Other studies even reported return to maladaptive behaviors within three to four months in 60% to 80% of the discharged population (Arbour et al., 2011; Brown, Vik, & Creamer, 1989; Sannibale et al.,

2003). Interestingly, only half of the patients discharged from the substance use treatment facilities followed- up with the outpatient aftercare services, and about 78% of individuals with SUD was found to have unmet mental health care needs (Arbour et al., 2011; Manuel et al., 2017; Ross et al., 2015). Similarly, only about 40% of the patients attended 12- step meetings following discharge from a 28-day inpatient cocaine treatment (Rawson, Obert, McCann, Castro, & Ling, 1991). Another study showed that 41% of the patients entering the treatment facility had no primary care provider (PCP) and only a small proportion obtained primary care after discharge (Saitz, Mulvey, & Samet, 1997).

The epidemiological findings of SUD and its associated health and economic consequences attest to the inadequacy of the traditional acute care approach in managing this condition. According to Dennis and Scott (2007), addressing SUDs within an acute care framework reduces the effectiveness of treating addicted persons towards sustainable recovery and abstinence. The chronic and relapsing nature of the disease spanning over the course of several years necessitates continuity of care and other services following addiction treatments to achieve full remission and recovery (Dennis & Scott, 2017; HHS, 2016). This is especially true during the vulnerable transitory period from the first few months to a year post- discharge when the risk of returning to problematic pattern of substance use and relapse are high (Arbour et al., 2011; Carter et al., 2008). Ensuring long- term aftercare through increased access and follow- up adherence to outpatient aftercare services promotes management of health and ongoing monitoring that fosters prevention, maintenance of recovery and abstinence goals, early intervention, and recovery support in this population (Arbour et al., 2011; Cucciare et al., 2014; HHS, 2016; McKay, McLellan, Alterman, Rutherford, & O’Brien, 1998).

Background and Significance

Substance use treatment facilities offer great opportunities for patient linkage and engagement to available aftercare services (Cucciare et al., 2014; Manuel et al., 2017). Actively facilitating access and follow-up adherence with aftercare plans is critical to improve health and substance use outcomes (Cucciare et al., 2014; Manuel et al., 2017). The study conducted by Manuel et al. (2017) found that the primary facilitators for effective care transition as perceived by the post- addiction treatment clients were patient- centered discharge planning, recovery check- up calls or visits, and linkage to support groups and aftercare substance use services. Findings indicate that early discharge preparation through individualized needs assessment (e.g. stable housing and employment), determination of patient goals and priorities, identification of community resources to address goals, and education regarding the chronic nature of SUD supports recovery and increases engagement with services (Manuel et al., 2017). Assisting clients to reconnect with supportive family and friends, and community-based recovery services also ensures continued progress towards addiction recovery (Manuel et al., 2017). One study supported this showing high- level recovery (either abstinence or at least 95% reduction in substance use) in 83% of participants who attended two or more aftercare substance use support services as compared to 71% who attended only one aftercare support service and 60% who did not attend any services at six- month follow- up (Arbour et al., 2011). Moreover, the result from a nine- year longitudinal study involving 991 participants who are post- substance use treatment showed that achievement of remission during follow- ups were more than twice as likely for those who had continuing care with at least one annual primary care visit and as needed specialty care visits including psychiatric and substance use treatment services (Chi et al., 2011).

On the other hand, a qualitative study conducted by Ross et al. (2015) identified collaborative, interdisciplinary care and support workers as facilitators for optimal care transition for clients with co-occurring disorders. The Substance Abuse and Mental Health Services Administration- Health Resources and Services Administration (n. d.) defined co-location as services located in the same building, while integration was defined as sharing the same sites, vision, and systems in a seamless web of biopsychosocial services. Although different, both not only enhance communication among providers but also increase the feasibility of access to quality and comprehensive care in this population (Ross et al., 2015). Evidence from research studies suggest that integration and co-location significantly increase primary care usage among persons with serious mental illnesses resulting to positive effects on health outcomes (Bradford et al., 2013; Druss, Rohrbaugh, Levinson, & Rosenheck, 2001; Pirraglia et al., 2012). Another study found that participants who received integrated medical and substance use treatment care showed higher abstinence rates than those assigned in the independent care group (Weisner, Mertens, Parthasarathy, Moore, & Lu, 2001). Similarly, significant favorable effects were noted on Addiction Severity Index (ASI) alcohol composite scores and abstinence rates at six months among patients with alcohol abuse and Hepatitis C who received integrated care (Proeschold-Bell et al., 2012). However, despite its numerous positive effects, several barriers including limited financial resources and available space make this task more challenging to implement (Cucciare et al., 2014; Padwa et al., 2012). In this case, another option is to utilize an on-site staff member who will screen for discharge needs and link patients to appropriate medical and community support services with offsite providers through facilitated referrals (Manuel et al., 2017; Padwa et al., 2012).

Facilitated referral involves conducting a health examination and psychosocial assessment, giving individualized education about the significance and potential benefits of receiving outpatient aftercare services, helping gain access to appropriate aftercare services, managing appointments, contacting clients after discharge to give reminders for the upcoming appointments, and rescheduling missed appointments if necessary (Cucciare et al., 2014; Manuel et al., 2017; Samet et al., 2003; Vederhus et al., 2014). This intervention facilitates linkage to outpatient aftercare services and promotes follow- up adherence after discharge (Cucciare et al., 2014; Manuel et al., 2017; Padwa et al., 2012). The study conducted by Stergiopoulos et al. (2015) compared the effectiveness of an Integrated Multidisciplinary Care (IMCC) model to Shifted Outpatient Collaborative Care (SOCC) model among homeless individuals with mental illness and some with substance use disorder. The IMCC model involves an on-site psychiatrist while the SOCC model requires referral to an outpatient psychiatric consultant (Stergiopoulos et al., 2015). At the end of the study, evidence suggests that both care models improved measures of community functioning, hospitalizations, emergency department visits, and primary care visits without significant differences between groups over time (Stergiopoulos et al., 2015). This underlines the validity of facilitated referral as another option when integration or co-location is not feasible. The study of Samet et al. (2003) further supported this finding showing that facilitated referral increased primary care usage and reduced substance use among participants compared to those who received standard care in an addiction treatment facility. The use of support workers to help link patients to services and manage appointments was also perceived to be beneficial by both the service providers and clients with co-occurring disorders (Ross et al., 2015).

Overall, current evidence suggests recognizing facilitators for care transition and utilizing integrated, co-located models of care or facilitated referral to help improve access and follow- up adherence among post- discharged SUD patients. This inquiry had led to the clinically relevant PICOT question: “In a residential substance use treatment facility, how does facilitated referral compared to usual care affect access and follow- up adherence to outpatient aftercare services, and relapse rate?”

Search Sources and Process

An exhaustive review of the literature was performed involving four electronic databases— The Cochrane Library (Appendix A), PubMed (Appendix B), Cumulative Index of Nursing and Allied Health Literature (CINAHL) (Appendix C), and PsycINFO (Appendix D). The search utilized keywords and relevant MeSH terms with Boolean connectors. Search terms that were used included: Group A (*primary health care OR mental health services*), Group B (*substance abuse OR substance abuse treatment centers OR addiction treatment OR vulnerable populations*), Group C (*referral and consultation OR access to healthcare OR aftercare OR appointment and schedules OR follow-up studies*), and Group D (*continuity of health care OR care transition*). All grouped search terms were utilized then searched in various combinations by using “AND” to obtain maximum yield. Limitations were applied to searches resulting to greater than 150 references for a more manageable initial result. The search was restricted to peer- reviewed journals published from 2012 to 2017, English language, humans, and age 19 and older. Initial yields were examined to determine relevance to the PICOT. Identified significant articles were then subjected to hand ancestry search for a more exhaustive exploration of the literature.

The following are specific discussions about the various search strategy combinations utilized in all four databases. First, the grouped search terms utilized in The Cochrane Library were the following: Groups A, B, C, and D yielding 0 article, Groups A, B, and C yielding 63 articles, Groups B, C, and D yielding 2 articles, and Groups B and C yielding 574 articles. The search strategy resulted to a total of 639 studies that were reduced to 182 references after limitations were applied. Second, the grouped search strategy used in Pubmed included: Groups A, B, C, and D yielding 15 articles, Groups A, B, and C yielding 347 articles, Groups B, C, and D yielding 71 articles, and Groups B and C yielding 19 articles. This resulted to a total of 452 studies that were reduced to 164 references after limitations were applied. Third, the grouped search terms used in CINAHL included: Groups A, B, C, and D yielding 1 article, Groups A, B, and C yielding 156 articles, Groups B, C, and D yielding 1 article, and Groups B and C yielding 300 articles. The search strategy resulted to a total of 457 studies that were reduced to 150 references after limitations were applied. Lastly, the grouped search strategy used in PsycINFO included: Groups A, B, C, and D yielding 0 article, and Groups A, B, and C yielding 636 articles. This resulted to a total of 636 studies that were reduced to 109 references after limitations were applied.

The yields from all four databases resulted to 605 articles that were subjected to further evaluation. After the initial appraisal of the studies' abstracts and after accounting for redundancies a total of 49 articles were extracted. Completion of hand ancestry led to the identification of ten more studies. The 59 articles were then further examined producing a final yield of 34 studies that were subjected to critical appraisal. Consequently, 11 studies were chosen for literature review: one meta- analysis, two systematic reviews, six randomized control trials (RCT), and two quasi-experimental studies.

Critical Appraisal and Synthesis

Eleven studies included in this literature review were subjected to rapid critical appraisal and were presented in the evaluation table (Appendix E). Melnyk and Fineout- Overholt's (2011) hierarchy of evidence were utilized. Overall, the strength of the studies exhibited high level of evidence with one meta-analysis and two systematic reviews for level one evidence, six randomized controlled trials for level two evidence, and two quasi- experimental studies for level three evidence (Melnyk and Fineout- Overholt, 2011). The selected studies were conducted in various countries but more than half were in United States (Appendix F). All studies but one were published within the last five years with each study clearly defining the sample populations, and the independent and dependent variables under study. Most of the articles did not discuss the theoretical framework or conceptual model used however, many were found in the reference sections revealing a high degree of heterogeneity in the models utilized. Majority of the studies used randomization with clearly described measures and adequate sample sizes. Minimal possible biases were reported across the studies but many utilized analytic measures to minimize biased estimates.

Additionally, the demographic information in the studies exhibits a moderate degree of homogeneity. Except for two articles, each study showed the sample's mean age within the middle- aged adult population, which is between 36 to 55 years. All research articles had greater number of male participants than female participants reflecting the current statistics released by SAMHSA (2015b) that reports greater substance misuse rates among men than women. Moreover, majority of the retained studies were conducted in substance use treatment facilities with samples divided between alcohol and drugs as primary substances used. Most studies also had attrition rates of less than 20% with clear explanation.

Heterogeneity in the interventions utilized was observed. However, further evaluation revealed moderate homogeneity in the included components of facilitated referral having health assessment, individualized education utilizing motivational interviewing approach, support services and appointment management as the main components included in most of the implementation plans. Synthesis showed that most of the studies conducted interventions for 15 to 30 minutes but a wide range of variability was observed in the frequency and duration of intervention sessions. The time frames for post- intervention follow- up were also varied but six studies had similar follow-up conducted at six months after intervention completion.

Primary outcomes of interest mainly focused on access and follow-up adherence, and continued care engagement to outpatient aftercare services. Several studies also measured substance use severity and relapse as secondary outcomes. Measurement instruments utilized to measure these outcomes were moderately heterogenous but clinic records, client self-report, EHR, and ASI composite scores were mostly utilized. The ASI composite score is a widely used standardized tool that evaluates problems related to substance use (Marcus & Zgierska, 2012). It has been utilized across various populations including homeless substance users and individuals with co-occurring disorders (Marcus & Zgierska, 2012). It also demonstrated high interrater reliability with Chronbach's alpha at 0.78 for alcohol and 0.68 for drug addiction severity (Marcus & Zgierska, 2012).

Overall, synthesis of evidence showed moderate homogeneity exhibiting significant increase in access and follow- up adherence to healthcare and community- based abstinence support services after discharge. Continued aftercare engagement was also observed in most of the studies but only four of eleven studies have significant results. Moreover, facilitated referral also revealed significant positive impact to substance use outcomes in minority of the studies

evaluated. Weaknesses identified include possibility for confounding bias and small sample sizes in some of the variables analyzed in the studies.

Synthesis Conclusion

Current evidence suggests that facilitated referral is an effective intervention to increase follow- up adherence with outpatient aftercare services following discharge from addiction treatment facilities among individuals with substance use disorders. Although only few studies demonstrated significant positive effects on continued patient engagement and substance use outcomes, small improvements could still be significant considering the devastating consequences of this disorder to health and well-being. Adapting facilitated referral through the implementation of a program with strong focus on individualized health assessments, education utilizing motivational interviewing, support services, and appointment management could improve the healthcare outcomes and reduce the relapse rate of this population.

Purpose and Rationale

Barriers to effective transition and follow- up adherence after completion of addiction treatment include homelessness and presence of co-occurring disorders (Manuel et al., 2017; Ross et al., 2015). Internal evidence gathered in two residential substance use treatment facilities in Arizona on July 2016 showed that 62% of the population had dual diagnosis and 67% were homeless. Despite the above, there were no clear interventions to enhance follow-up adherence and engagement to aftercare services after discharge and there was no extension of services beyond the residential treatment to provide the full continuum of care once discharge from the facility. Improving this problem could enhance the health and prevent relapse among this population. For this reason, this study aimed to examine the effectiveness of facilitated referral in improving access, follow-up adherence and engagement to aftercare services, and relapse rate

after a month post- discharge. Through the implementation of facilitated referral, participants who completed residential substance use treatment may have increased access and engagement to community aftercare services, improved health through increased follow-up and engagement with medical provider, and decrease risk of relapse and maintenance of abstinence a month following discharge.

Theoretical Model and Evidence- Based Practice (EBP) Model

Glasser's Choice Theory was selected to guide the proposed care transition practice change. This theory emphasizes that all behavior is chosen and humans can exercise control in their lives (Glasser, 1998). The intrinsic motivation to satisfy the basic needs influences the chosen behavior and building positive relationships without coercion creates a shared vision to pursue common goals (Glasser, 1998). The theory emphasizes four interrelated variables namely reality and perception, quality world, comparing place, and total behavior. According to Glasser (1998), there are perceived world and quality world. The perceived reality is constructed based from the senses, knowledge, and values while the quality world represents the created perfect world that is significant and the source of all motivation (Glasser, 1998). Humans compare and contrast between these worlds at the comparing place influencing behaviors to create a match between the two (Glasser, 1998). Further, Glasser (1998) posits that humans choose all behaviors (acting, thinking, feeling, and physiology). The first two are present in the conscious mind so humans have greater control with it unlike the latter two that are more present in the subconscious or unconscious (Glasser, 1998). However, since these components are interrelated, changing one can make changes to other components as well. Considering the above, facilitated referral can promote linkage to necessary outpatient aftercare services that may help satisfy basic

needs and support choice of responsible actions and thoughts that can positively change the emotions and physiology of addicted individuals towards better outcomes.

Two evidence-based models were chosen to facilitate this project: a) The Model of Care Transitions from Addiction Treatment to Primary Care and b) The Model for Evidence- based Practice Change. The Model of Care Transitions from Addiction Treatment to Primary Care was chosen to guide the proposed care transition practice change (Appendix H). This evidence-based conceptual model explains and focuses on interrelated concepts and propositions namely barriers and facilitators, transition practices, process outcomes, and health outcomes that guide successful facilitation of care transitions among individuals diagnosed with SUD after discharge from treatment facilities (Cucciare et al., 2014). It fits the design of the proposed project that will follow the continuum as illustrated by the model. The project will include assessment of patient, provider, and system barriers and facilitators, implementation of facilitated referral, evaluation of healthcare access and engagement outcomes, and examination of substance use outcomes.

On the other hand, The Model for Evidence- Based Practice Change by Rosswurm and Larabee (1999) facilitated this project (Appendix I). The six-step model was designed to guide systematic evidence- based practice change emphasizing the significance of utilizing change theory, research principles, and standardized nomenclature (Pipe, Wellik, Buchda, Handen, & Martyn, 2005). It provides solid grounds for change in practice tested in acute care settings but adaptable to primary care settings as well (White, Dudley-Brown, & Terhaar, 2016). This EBP model was chosen because the steps provide a framework for designing and implementing a care transition practice change to increase follow-up adherence with healthcare services and reduce relapse rate among persons with SUD after discharge. The six steps include: a) assessment of need for practice change, b) linkage of problem interventions and outcomes, c) synthesis of best

evidence, d) designing a practice change, e) implementation and evaluation of change in practice, and f) integration and maintenance of practice change (Rosswurm & Larabee, 1999). For this project, internal and external data were collected and compared to identify the problem regarding access and follow-up adherence to healthcare services after discharge from a residential substance use facility. These data were assessed to identify the need for practice change. Facilitated referral was then linked to follow-up adherence and relapse rate. Next, the best research evidence found through exhaustive literature search was then synthesized to determine whether the strength of evidence supports change in practice. After synthesis, an implementation plan with detailed descriptions of the process and outcome variables will be designed considering the feedback from stakeholders. A pilot study will then be implemented and continuous assessment of processes and outcomes will be performed modifying the plan based from these evaluations. Finally, education of stakeholders about the results and the recommended change will be performed if the pilot study results support integration of new practice into standards of care.

Methodology

The interorganizational collaboration involving the facility, Student Health Outreach for Wellness (SHOW) and iTether supported the development and implementation of the project. SHOW is a tri-university, interprofessional, student-led organization that offers free healthcare and education in the facility while, iTether develops mobile applications that serves as a platform to transform delivery of healthcare and integration of services. The project gained approval from the Arizona State University- Institutional Review Board (ASU-IRB) on September 11, 2017 with two minor modifications during the implementation phase (Appendix J). After approval, a comparative study with descriptive statistics on selected variables was conducted involving a

convenience sample of 30 participants admitted in two residential substance use treatment facilities located in Phoenix, Arizona. Proposed budget was completed prior to the implementation of intervention (Appendix K). Facilitated referral, involving health assessment, individualized education with motivational interviewing, resource access support services and appointment management, was implemented for six months with the iTether application serving as a platform to educate, collect data, and communicate after discharge.

The demographic questionnaire (Appendix L) and data collection form (Appendix M) were created to collect demographic data, and track progress in community resource access, follow-up adherence after discharge and relapse rate at 30 days post-discharge. Pre- and post-test of health leads screening toolkit to assess changes in social needs was used (Appendix N). The health leads screening toolkit was a patient-centered and well-researched instrument utilized for 20 years and clinically validated by sector authorities such as the Institute of Medicine, Centers for Medicare and Medicaid Services and the Centers for Disease Control (Health Leads, 2018). Similarly, pre- and post- test of the assessment of warning signs of relapse (AWARE) to assess changes in relapse percentage risk was utilized (Appendix O). Gorski and Miller (1982) developed the tool to measure the warning signs of relapse following addiction treatment. It was originally a 37- item questionnaire found to be a good predictor of the occurrence of relapse ($r=.42$, $p<.001$), which was then refined to the present 28-item scale ($r=0.80$) with subsequent analyses by Miller and Harris (2000). It is a self-report questionnaire having a one to seven rating scale with scores ranging from 28 (lowest score possible) to 196 (highest possible score). Participants with higher scores have relapse rates of 33 to 46 percentage points higher than those with lowest scores (Miller & Harris, 2000). This 28-item questionnaire demonstrates excellent internal consistency with Cronbach's alpha of .92- .93 (Miller & Harris, 2000).

Data analysis was performed using the IBM SPSS 23.0 Statistics Software. Descriptive statistics were done to describe the data collected. Further, McNemar test and Wilcoxon signed rank test were utilized to assess differences between paired nominal data and paired ratio data, respectively. A *p*-value of <0.05 denotes statistically significant difference. The ASU graduate statistics tutorial services and faculty statistics mentor verified the accuracy of the statistical analyses.

Intervention Process

Project flyers were utilized to recruit participants during the admission assessment process in the facility (Appendix P). Facilitated referral was implemented among participants who signed the informed consent (Appendix Q). The participants were asked to fill out the demographic questionnaire, pre-intervention AWARE tool, and the pre-intervention health leads survey upon recruitment. As part of the routine care, a biopsychosocial assessment by the facility and SHOW, and the initiation of the care pathway form were done to evaluate discharge aftercare needs of participants. The researcher completed the data collection form by gathering information from the care pathway form and iTether application throughout the implementation process. During the stay in the facility, participants were asked to attend at least 15-minute weekly individualized educational sessions with motivational interviewing for three to four weeks then on as needed basis until discharge. The educational meetings followed the outline of educational sessions (Appendix R). Support access to needed outpatient aftercare services and appointment management were conducted in collaboration with the facility and SHOW. Prior to discharge, participants were asked to fill out the post- intervention AWARE tool. Reminder messages were sent a week prior to the scheduled appointments after discharge. Data regarding follow-up adherence and engagement to aftercare services were collected the day after the

scheduled appointments. If appointments were missed, education was provided about the importance of engagement with aftercare services and appointment reschedule was offered. At 30 days after discharge, participants were asked to fill out the post-intervention health leads survey. Information regarding relapse status was also gathered. If a new need was identified, education regarding available resources and referral to SHOW was done as needed. Education about hotline numbers and available resources was provided if patient relapsed after discharge. In the absence of iTether, participants were contacted depending on their preferred contact modality. Attempts to contact the two trusted individuals identified by the participants were made if participants were not reached through iTether or preferred contact modality.

Project Result

As illustrated in Table 4 (Appendix S), data showed that the sample (*N*=30) had 16 males (53.3%) and 14 females (46.7%) with a mean age of 35.37 (SD=10.47), ranging from 20 to 59 years. Majority of them were Caucasians (n= 13, 43.3%), had high school diploma or equivalent (n=14, 46.7%), were single (n=15, 50%), had prior addiction treatment (n=16, 53.3%), had history of imprisonment (n=25, 83.3%), had history of homelessness (n=19, 63.3%), and had Medicaid (n=24, 80%). Additionally, more than half of the participants were admitted voluntarily (n=19, 63.3%) with methamphetamines (n=10, 33.3%) and alcohol (n=8, 26.7%) as the most frequent primary substance used. On the other hand, the most frequent secondary substance utilized were methamphetamines (n=8, 26.7%) and marijuana (n=7, 23.3%). 13 participants (43.3%) reported presence of medical condition with arthritis (n=4, 13.3%) as the most common medical illness. Meanwhile, 11 participants (36.7%) reported presence of psychiatric disease with depression (n=7, 23.3%) and anxiety (n=7, 23.3%) as the most common

psychiatric condition. Lastly, most participants stayed for 60 days (n=90, 30%) and majority were discharged to home (n=8, 26.7%).

The McNemar test evaluated the change in social needs pre- and post- intervention (Appendix T). Although not all values showed statistically significant difference, the result suggested a decrease in requests of social needs assistance in all variables except psychiatric provider linkage needs. Variables with statistically significant results were smart phone needs (p=.002), food insecurity (p=.016), housing instability (p=.001), utility needs (p=.031), financial resource strain (p=.016), transportation needs (p<.001), unemployment (p<.001), behavioral/mental needs (p=.021), primary care provider linkage needs (p=.031) and sponsor linkage needs (p=.002). Unfortunately, the data also showed that only one in fifteen participants who expressed dental care needs got linkage to services (p=1), only five out of fourteen accessed eye care services (p=.063), and only one out of four obtained legal services (p=1).

Additionally, descriptive and correlation statistics were performed to compare between the pre- and post- intervention relapse risk percentages (Appendix U). Results showed that the mean pre-intervention relapse risk percentage was 65.43 (SD=23.38), ranging from 21% to 91% (n=30). On the other hand, the mean post-intervention relapse risk percentage was 30.93 (SD=21.55), ranging from 11% to 82% (n=14). The Wilcoxon Signed Ranked test were also completed to compare data. Data analysis showed a significant difference in the results (Z= -3.180, p= .001), indicating a reduction in relapse risk post intervention.

Four participants relapsed while in the facility and 12 participants were lost to follow-up prior to discharge (Appendix V). For this reason, correlation statistics were not performed to avoid biased results. Instead, descriptive statistics were utilized to examine follow-up adherence, engagement, and relapse rate at 30 days following completion of residential treatment. As shown

in Table 6 (Appendix W), ten out of fourteen remaining participants had scheduled appointments with PCP after discharge. Nine participants attended the PCP appointments and eight scheduled their next follow-up visits indicating continuous engagement. Further, all 14 participants had scheduled a meeting with their sponsor after discharge, with 12 attending their meetings and scheduling their next meeting. Similarly, 13 out of 14 participants set the date for the support group meeting to attend once discharged, with 12 attending their meetings and setting the next support group meeting to attend to. An additional six participants were lost to follow-up at 30 days post- discharge while, eight participants reported continued sobriety (Appendix X). Interestingly, there was a noticeable difference between male and female. More males (n=7) completed the study versus females (n=1).

Discussion

People with SUD are highly stigmatized compared to those diagnosed with other illnesses (Livingston, Milne, Fang, & Amari, 2012). Unfortunately, society treats this health condition as a moral issue rather than a disease process and was associated with other stigmatized health and social factors such as sexually transmitted illnesses, poverty, criminality, and low education level (HHS, 2013; Livingston et al. 2012). Some of these characteristics were reflected in the study showing that most participants did not enter college, and had history of imprisonment, homelessness and prior addiction treatment. Study showed that these further aggravate the stigma, complicating the efforts to build social acceptance (Villa, 2018). The public exclusion and shaming causes profound social isolation that hinders actions to seek treatment (Villa, 2018). This could explain the low percentage of people entering substance use treatment. For this reason, the decision to enter substance use treatment facilities open great opportunities for patient linkage and engagement (Cucciare et al., 2014; Manuel et al., 2017).

The multidisciplinary team should utilize this opportunity for linkage and engagement to community aftercare services to address the chronic nature of the disease and promote optimal outcomes. Further, implementation of strategies that promote stigma reduction is critical for prevention and initiation of early treatment among people suffering from SUD (Prevention Institute, 2009).

Additionally, the study also found that among participants with a mean age of 35 methamphetamines and alcohol were the most frequent primary substances abused while, methamphetamines and marijuana were the most frequent secondary illicit drugs abused. This is consistent with the study conducted by Merline, O'Malley, Schulenberg, Bachman, and Johnston (2004) that showed alcohol and marijuana as the most frequent substance abused among participants aged 35 years. HHS (2013) also supported this finding stating that after alcohol, marijuana had the highest rate of dependence among all abused substances. On the other hand, Cunningham (2014) reported that in Maricopa County methamphetamine was the most common primary substance abused involved in treatment episodes.

Interestingly of the 30 participants only 13 reported chronic medical conditions and 11 reported psychiatric illness. This could be affected by age-related factors considering that most participants were young adults (Buja et al., 2014; Piazza, Charles, & Almeida, 2007). Further, 22 out of 30 participants reported a need to establish a relationship to a primary care provider. The lack of access to a primary care physician could result to undiagnosed illnesses (Delhi & Kigali, 2017). Moreover, the study of Albanese, Clodfelter, Pardo, and Ghaemi (2006) showed that bipolar disorder was frequently underdiagnosed among people with SUD.

An encouraging finding was facilitated referral effectively increased access to most community aftercare needs (Lindahl, Berglund, & Tonnesen, 2013; Samet et al., 2003).

Facilitated referral significantly addressed smart phone needs, food insecurity, housing instability, utility needs, financial resource strain, transportation needs, unemployment, behavioral/mental needs, primary care provider linkage needs and sponsor linkage needs. Linkage and engagement to community aftercare services following completion of residential substance use treatment is critical to address the chronic nature of the disease and the social determinants of health that could affect overall health and substance use outcomes (Cucciare et al., 2014; Manuel et al., 2017). The interdisciplinary, collaborative efforts to support access of aftercare services among individuals suffering from SUD offers linkage that is a necessary initial step to derive potential benefits (Samet et al., 2003). Unfortunately, several participants reported dental and eye care needs but more than half cannot get access to services. The limited dental and vision coverage by the Arizona Health Care Cost Containment System (AHCCCS) could be one of the factors hindering access to these services (AHCCCS, 2018). Changes in policy to include preventative dental and vision services among Medicaid adult beneficiaries are warranted to address these significant unmet needs.

Surprisingly, none of the participants reported exposure to violence. Studies have shown the association between SUD and intimate partner violence (Soper, 2014). The U.S. Department of Justice reported that 42% of victims used alcohol or drugs with positive toxicology screen the day of the assault, and women who abused substances are more likely to have experienced abuse in relationship(s) (Steps to Recovery, 2018). According to Fulfer et al. (2007), victims may have reluctance to discuss the abusive relationship due to feelings of shame, concern of disclosure, or fear of being blamed. Using indirect questions may help circumvent these barriers (Ashur, 1993). For this reason, phrasing the question in a more indirect manner could have produced a more accurate result.

Facilitated referral also significantly decreased the relapse percentage risk among the participants. This could be associated to the increased access and linkage to community aftercare services. Since social determinants of health establishes living conditions and indirectly impacts substance use outcomes, addressing this can lead to positive outcomes including decrease in relapse percentage risk (Galea & Vlahov, 2002). The residential treatment, however, was an extraneous variable that could have affected the result.

The researcher was only able to follow-up with 14 out of 30 participants from admission to discharge due to difficulty meeting with the participants once transitioned to the intensive outpatient program secondary to work schedule. Out of 14 remaining participants, most followed-up with their aftercare services appointments scheduled after discharge with continuous engagement. This implies the effectiveness of facilitated referral to improve follow-up adherence and engagement to community aftercare services. This is consistent with the synthesis of evidence involving 11 high level studies (See Appendix F). Furthermore, more than half of the 14 remaining participants maintained sobrieties at 30 days following discharge. This may imply the positive effect of facilitated referral to relapse outcomes however, this should be interpreted cautiously due to the high attrition rate of the study. Nevertheless, small improvements could still be significant considering the devastating consequences of this disorder to overall health. For this reason, policy changes to incentivize programs designed to offer the full continuum of care for substance use treatment including residential, outpatient, continuing care, and recovery support are needed to integrate care for substance use disorders and positively affect substance use outcomes (Sugeon General, 2018). Future research is warranted to further establish correlative association between facilitated referral, and follow-up adherence/ engagement to services and relapse rate.

Another interesting finding was only one female compared to seven male participants completed the study. This is consistent with the findings that women tend to underutilize substance use treatment services compared to men (Hecksher & Hesse, 2009). Women also prefer to seek support services from general healthcare systems rather than from specialized substance use facilities (Mojtabai, 2005). The study of Beckman and Amaro (1986) showed that women are inclined to conceal their problem of addiction from professionals due to a more negative attitude towards professionals than males (Hecksher & Hesse, 2009). Worse, they develop problems with drugs and alcohol faster and more severely than men with more adverse medical, psychiatric, and social consequences (Back, Contini, & Brady, 2007; Hecksher & Hesse, 2009). These factors could have contributed to the female participant's high attrition rate and highlights the vulnerability of women suffering from SUD. With this, Hecksher and Hesse (2009) recommends implementation of outreach services that will overcome the barriers to seeking treatment for women such as motivational enhancement and treatment engagement, treatment coordination, monitoring, and aftercare follow-up with peer support and relapse monitoring.

Lastly, the project strengths include the inter-organizational collaboration among three organizations that offers multidisciplinary and innovative approaches to care transition, utilization of high level studies to support the evidence-based intervention, use of theoretical and EBP models to guide the project, and protection of research participant rights through IRB approval. On the other hand, project limitations include inability to establish correlatives for follow-up adherence, continued engagement, and relapse rate at 30 days due to high attrition rate. Ideally facilitated referral will be continued and enhanced incorporating the intervention

within SHOW processes by including nursing students specializing in care transition and/ or social workers to sustain this project.

Conclusion

Facilitated referral effectively increased access to needed aftercare services post-discharge after SUD treatment and significantly decreased the risk of relapse. This is a promising intervention that must be considered if the chronic disease of SUD is to be adequately addressed. Future research is recommended to further examine and identify best practices related to follow-up adherence and continuous engagement to aftercare services especially as it relates to women.

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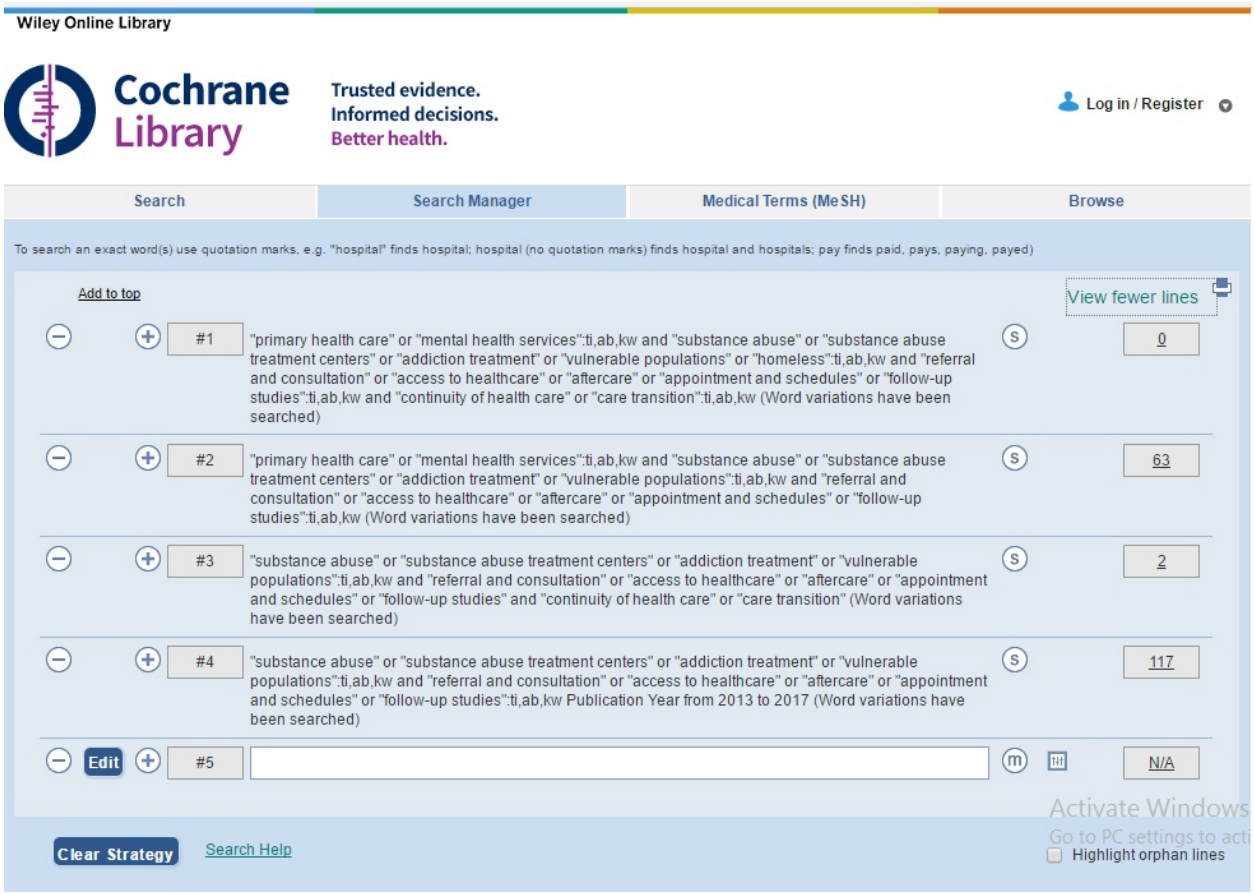
Appendix A

Search Strategy 1

The Cochrane Library



Appendix B

Search Strategy 2

PubMed

Search	Add to builder	Query	Items found	Time
#8	Add	Search (((**"substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])) AND Homeless persons[MeSH Terms]** Filters: **published in the last 5 years; Humans; English; Adult: 19+ years**	19	15:19:25
#7	Add	Search (((**"primary health care" OR "mental health services"[MeSH Terms])) AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])** Filters: **published in the last 5 years; Humans; English; Adult: 19+ years**	85	15:17:52
#6	Add	Search (((**"primary health care" OR "mental health services"[MeSH Terms])) AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])** Filters: **Humans; English; Adult: 19+ years**	336	15:16:15
#5	Add	Search (((**"primary health care" OR "mental health services"[MeSH Terms])) AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])** Filters: **Humans; Adult: 19+ years**	347	15:15:38
#4	Add	Search (((**"substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])) AND ("continuity of health care" OR "care transition"[MeSH Terms])** Filters: **Humans; Adult: 19+ years**	45	15:14:17
#3	Add	Search (((**"substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])) AND ("continuity of health care" OR "care transition"[MeSH Terms])** Filters: **Humans**	71	15:13:10
#2	Add	Search (((**"substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])) AND ("continuity of health care" OR "care transition"[MeSH Terms])**	71	15:12:47
#1	Add	Search ((((**"primary health care" OR "mental health services"[MeSH Terms])) AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations"[MeSH Terms])) AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies"[MeSH Terms])) AND ("continuity of health care" OR "care transition"[MeSH Terms])**	15	15:11:42

Appendix C

Search Strategy 3

CINAHL

Search ID#	Search Terms	Search Options	Actions
S9	("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	**Limiters** - Published Date: 20120101-20171231 **Narrow by SubjectAge:** - all adult **Narrow by Language:** - english **Search modes** - Boolean/Phrase	View Results (66) | View Details | Edit
S8	("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	**Limiters** - Published Date: 20120101-20171231 **Narrow by Language:** - english **Search modes** - Boolean/Phrase	View Results (223) | View Details | Edit
S7	("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	**Limiters** - Published Date: 20120101-20171231 **Search modes** - Boolean/Phrase	View Results (225) | View Details | Edit
S6	("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	**Limiters** - Published Date: 20100101-20171231 **Search modes** - Boolean/Phrase	View Results (300) | View Details | Edit
S5	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	**Limiters** - Published Date: 20100101-20171231 **Narrow by Language:** - english **Search modes** - Boolean/Phrase	View Results (83) | View Details | Edit
S4	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	**Narrow by Language:** - english **Search modes** - Boolean/Phrase	View Results (153) | View Details | Edit
S3	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	**Search modes** - Boolean/Phrase	View Results (156) | View Details | Edit
S2	("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies") AND ("continuity of health care" OR "care transition")	**Search modes** - Boolean/Phrase	View Results (1) | View Details | Edit
S1	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies") AND ("continuity of health care" OR "care transition")	**Search modes** - Boolean/Phrase	View Results (1) | View Details | Edit

Appendix D

Search Strategy 4

PsycINFO

Set	Search	Databases	Results	Actions
S6	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies") ✔ Limits applied	PsycINFO	109*	Actions
S5	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies") ✔ Limits applied	PsycINFO	495*	Actions
S4	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies") ✔ Limits applied	PsycINFO	498*	Actions
S3	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies") ✔ Limits applied	PsycINFO	500*	Actions
S2	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies")	PsycINFO	636*	Actions
S1	("primary health care" OR "mental health services") AND ("substance abuse" OR "substance abuse treatment centers" OR "addiction treatment" OR "vulnerable populations") AND ("referral and consultation" OR "access to healthcare" OR "aftercare" OR "appointment and schedules" OR "follow-up studies") AND ("continuity of health care" OR "care transition")	PsycINFO	0*	Actions

Appendix E

Table 1

Evaluation Table

Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/ Application to practice
Acquavita et al. (2013). Client incentives versus contracting and staff incentives: How care continuity interventions in substance abuse treatment can improve residential to outpatient transition. **Country:** USA **Funding:** National Institute on Drug Abuse (NIDA) **Bias**: No identified bias	Inferred to be Social Cognitive Theory and Transtheoretical Model	**Design:** Quasi-experimental **Purpose:** To examine the effect of CI and CSI to the rates of patient transition from residential to OP tx.	**N**= 260 **CG**: n= 114 **IG1** (CI): n=97 **IG2** (CSI): n= 49 **Demographics (CG/IG1/IG2):** AA: 84%; Other: 16% $\bar{x}$ age: 43/43/45 CG F/M: 36%/64% IG1 F/M: 40%/60% IG2 F/M: 37%/63% MS (never married): 60%/58%/61% $\bar{x}$ education years: 11/12/11 Heroin use: 55%/43%/57% MH: 27%/37%/27% CJR: 30%/19%/35% Court Ordered: 9%/7%/16% **Setting:** Adult RSATF in West Baltimore, MD; 28-	**IV1**:CI (Scheduled appointments; Four $25 gift cards given per visit w/in 30 days) **IV2**: CSI (15-minute brief in-person orientation utilizing MI approach; Scheduled appointments; Continuing care contracts; $100-dollar incentive per participant referred based on successful enrollment) **DV1**: Initial contact **DV2:** Tx adm **DV3:** Receipt of OP appointment **DV4:** Site effects **DV5**: Time to initial contact **DV6:** Time to OP appointments	• Records from EHR • Intake records	SPSS version 19 • Chi square analysis: to examine differences among groups at the nominal level (DV1, DV2, and DV3) • Z-tests between proportions to examine between group differences • ITT analysis: To include all participants irrespective of deviation from the protocol. Gives unbiased estimate of tx effect. It preserves the sample size	**(CG/IG1/IG2)** **DV1:** TR: 64%/74%/84% [X^2 (2, N=260) =8.48, p=0.014] TR (post-hoc): CSI> CG made initial contact with OP program (p= <0.05); CI did not differ significantly with either CG or CSI ITT: 58%/74%/82% [X^2 (2, N= 260) =12.29, p=0.002] **DV2:** 58% (150/260) were admitted. TR: 49%/60%/74% [X^2 (2, N= 260) =8.60, p=0.14] TR (post-hoc): only CSI and CG differed significantly (p= <0.05) ITT: 41%/60%/74% (X^2 =17.62, p=0.000) ITT (post- hoc): CG differed significantly from both CI and CSI (p= <0.05)	**LOE:** III **Strengths:** • Significant results • Valid study with comprehensive lists of variables • AR=0 • There are no significant differences in baseline characteristics of subjects in each group • ITT analysis was done to give unbiased estimate of tx effect considering protocol deviation **Weaknesses:** • Non-randomized study

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or conflict of interest			bed short-term MM-IRP; 8 OP referral sites **IC:** >18 y/o, understood English, admitted for ≥14 days **EC:** Prior consented study participant, lives outside Baltimore City or immediate surrounding area at time of d/c, d/c to specific OP tx due to prior affiliation or special needs, d/c to RT programs in the surrounding area that offered SUT on-site or at an affiliated OP program **AR:** 0	**DV7**: 30-day tx retention (number of attendance)		preventing reduced statistical power (DV1 and DV2) • TR analysis: To analyze only according to the actual interventions received irrespective of the randomized allocations (all outcome variables) • Logistic regression: to examine site effects for primary outcomes predicting initial contact and tx adm. Analyses with clinic site (on-site versus off-site clinic) and study condition (CG, CI, CSI) (DV4) • One-way ANOVA followed by Tukey's post-hoc tests: used to analyze data with one independent and one dependent variable. Identifies specific between	**DV3:** 52%/83%/92% [X^2 (2, N=260) =63.45, p=0.000] Post-hoc: CI and CSI> CG (p= <0.05). **DV4 (on-site vs. off-site clinic):** Initial contact: 76% vs. 64% (Wald= 4.63, p=0.031, OR= 1.83, CI= 1.05- 3.17) Tx adm: 62% vs. 52% (Wald= 2.630, p=0.105, OR= 1.52, CI= 0.92- 2.53) Study condition: non- significant **DV5:** $\bar{x}$ time= 3.7 days (SD=4.8) CG: $\bar{x}$ time= 4.1 days (SD=4.9) CI: $\bar{x}$ time= 4.4 days (SD=5.9) CSI: $\bar{x}$ time= 1.9 days (SD=2.6) (F(2, 181)=4.06, p=0.019) ES (CSI &CG): -0.45 (small) Post-hoc comparison: CSI made their initial contact sooner than CI and CG. CI did not differ from CG. **DV6 (n=184):** $\bar{x}$ time= 2.9 days (SD=3.8) CG: $\bar{x}$ time= 3.9 days (SD=4.5) CI: $\bar{x}$ time= 3.2 days (SD=3.8) CSI: $\bar{x}$ time= 1 day (SD=1.5) (F(2, 181)=9.07, p=0.000) ES (CSI &CG): -0.64 (moderate) Post-hoc comparison: time to the appointment is shorter in CSI than CI and CG (p=<0.05)	• Protocol deviation: 27 participants assigned in CSI were moved to CG due to staffing changes • Generality of study findings is limited due to implementation at a single RSATF and single OP tx system **Feasibility:** • Good for use in practice however challenges may arise identifying and training CSI counselors and providing financial incentives

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						group differences (DV5, DV6, and DV7)	**DV7 (n=138):** 91% of participants admitted to tx x̄ number of visits= 6.2 (SD=4.7) CG: x̄ number of visits= 5.0 CI: x̄ number of visits= 7.4 CSI: x̄ number of visits= 6.1 (F(2, 133)=3.45, p=0.035) Post-hoc: CI attended more treatment visits than CG but not significantly more than CSI.	
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Major Variables & Definitions**	**Measurement**	**Data Analysis**	**Findings**	**Decision for Use in Practice/ Application to practice**
Blodgett et al. (2014). How effective is continuing care for substance use disorders? A meta-analytic review. **Country:** USA **Funding:** U.S. National Institute on Alcohol Abuse and Alcoholism. U.S. Department of Veterans Affairs	Inferred to be the Continuing Care Model of Substance Use Treatment, CBT model, Trans-theoretical model, Social Cognitive Theory, Chronic Care Model	**Design:** Meta-analysis **Purpose:** To estimate the effect of continuing care and formally test several proposed moderators of that effect	**N=** 33 studies **n=** 19 (assessed for magnitude and significance of the overall effect of continuing care on SU outcomes) **Demographics for n** Total no. of participants: 3,542 x̄ % White: 55.1% x̄ % Black: 50.1% x̄ % Latino: 6% x̄ Age: 34.7 yrs. (15.9-44.4) M/F: 71.1%/28.9% Alcohol: 47.4% Drugs: 10.5% Both: 42.1%	**IV1:** Continuing care • CBT • CBT-like (skills training, problem solving, contracting, incentives) • MET/MI • **G**eneral/unspecified counseling **IV2:** Duration **IV3:** Intensity **IV4:** CBT **DV1**: SUD outcomes (aftercare participation, relapse rate and SU, healthcare benefit utilization, criminal activity, many more) **DV2:** Continuing care effects	• Coding form • Moderator measures (Duration, Intensity, Type of treatment, or method of treatment delivery)	• Comprehensive Meta-Analysis version 2.2.048 and an R routine: to conduct moderator analyses • Cohen's *d:* to calculate the standardized mean difference for continuous outcomes • Hedge *g* correction: for small sample bias • F- test statistic: to transform values into standardized mean difference • Aggregation procedures in MAd and RcmdrPlugin.	**IV 1 on DV1:** A significant but small effect favored continuity of care over control (g=0.187, p=<0.001, n=18); significant heterogeneity of ES ($I2$=35%, Q=26.1, p=0.07). <u>Last follow-up point after the end of continuing care:</u> (g=0.271, p=<0.01, n=13); significant heterogeneity of ES ($I2$=76%, Q=49.2, p=<0.001). **IV2 on DV2:** Months of planned continuing care was not significantly associated with ES at the end of continuing care (b=0.001, p=0.66, n=17) or at the last follow-up point after the continuing care (b=0.008, p=0.67, n=12) **IV3 on DV2:** Planned sessions per week was not significantly	**LOE:** I **Strengths:** • High level of evidence • All studies utilized were RCTs • Absence of publication bias per assessment • Significant results • Valid study **Weaknesses:** • SUD outcomes not specified, had to search for individual studies • Only 19 of 33 studies were analyzed

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Bias: No identified bias or conflict of interest			**Setting:** inpatient setting (42.1%), OP setting (36.8%), Mixed (21.1%) **IC:** Controlled trials of one or more continuing care interventions for people with SUD, publication since 1988, at least 5 participants to each condition, at least one SUD outcome. **AR:** N/A			MAd: to combine all effect sizes within each study • Random effects model: to calculate overall effect sizes • Q- statistic: a measure of the heterogeneity of effect sizes • *I*2 Statistic: to estimate the percentage of variability in ES across studies that is due to heterogeneity • Univariate mixed-effects tests: to examine the aggregate effect size for each subgroup of categorical moderators • Meta-regression in R's *metafor* program: to examine the aggregate effect size for each subgroup of continuous moderators	associated with the effect of continuing care compared to control at the end of tx (*b*=-0.027, *p*=0.46, *n*=17); last follow- up (*b*=*-0.062*, *p*=0.74, *n*=12) **IV4 on DV2:** CBT compared to non- CBT condition (*g*=0.120, *p*=0.01, *I*2=39%, *n*=12), small but significant effect CBT compared to control condition (*g*=0.195, *p*=<0.001, *I*2=39%, *n*=8), significant effect	• Possible Type II error due to small Ns of studies **Feasibility:** Good for use in practice

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/ Application to practice
Graham et al. (2016). Pilot randomized trial of a brief intervention for comorbid substance misuse in psychiatric in-patient settings. **Country: UK** **Funding:** National Institute for Health Research (NIHR), Birmingham & Solihull Mental Health NHS Foundation Trust, University of Birmingham **Bias:** No identified bias or conflict of interest	Inpatient- based service model Integrated service delivery model Inferred to be Transtheoretical Model	**Design:** RCT **Purpose:** to evaluate the effectiveness of BIMI in improving engagement to SUT	**N=** 59 **TAU**: n= 29 (28 analyzed) **IG**: n= 30 **Demographics (TAU/IG):** Caucasian: 58.6%/36.6% Asian: 17.3%/16.6% Black: 20.7%/30% Mixed: 3.4%/0% $\bar{x}$ age= 37.69/39.5 yrs. TAU F/M= 13.8%/86.2% IG F/M= 16.7%/83.3% Lives alone= 55.2%/53.3% Alcohol: 37.9%/40% Cannabis: 44.8%/46.7% Others: 17.2%/13.3% Schizophrenia: 65%/56.7% Bipolar: 24.1%/33.3% Others: 10.3%/10% **Setting:** In- patient units, w/in a single UK, NHS Trust including 11 acute wards and 3 PICUs,	**IV:** BIMI (3- step framework delivered over a 2-week period for 4-6 sessions lasting 15- 30 minutes each with a booster session a month after completion: a) personalized health feedback and tailored psychoeducational material, b) Strategies' to promote decision-making skills; peer mentor offered, and c) Encourage contemplation of change and identification of self-goals) **DV1:** SUT Engagement **DV2:** Readiness to change the SU behavior **DV3:** NOD SU **DV4**:SU Severity **DV5:** Psychological functioning **DV6:** Style of recovery from MHP **DV7:** Insight in MHP **DV8:** Cost-effectiveness	• SATs • Client Service Receipt Inventory • Client- self report • Records from EHR • EQ-5D • Qualitative semi-structured interviews • 8-point hierarchical motivational scale • 19-item Stages of change readiness and Tx eagerness scale • Importance-confidence ruler • Section B of the Maudsley Addiction Profile • CDUS/CAUS • SDS • AUDIT • RSQ • Insight scale • HADS	• SAS version 9.4 • ITT analysis: to analyze on the basis of the group to which they were randomized regardless of the tx that they actually received (all outcome variables) • Proportional odds model: to analyze ordinal categorical data (DV1) • Analogous generalized mixed models: to allow response variables from different distributions, such as binary responses (DV2, DV3, DV4 and DV5) Conventional two-sided alpha of 0.05	**IV:** $\bar{x}$ exposure in IG= 3.14 sessions (SD=1.92, Range 1-5); $\bar{x}$ duration of sessions= 18.3 mins (SD=4.9); average total $\bar{x}$ duration of intervention= 57.5 mins (SD=31.33); booster session (n=9); Peer mentor (n=2) **DV1:** 63% relative odds increase in SUT engagement as measured by SATs, statistically significant [OR=1.63 (95% CI: 1.01-2.65; p=0.047)] **DV2:** No overall statistical analysis due to missing data. <u>Motivation to change</u> Baseline: IG [6.77(SD=3.23)]; TAU [7.19(SD=3.58)] ES: -0.12 (no effect) Across time: IG [7.08(SD=3.74)]; TAU [6.89(SD=3.3)] ES: 0.05 (no effect) <u>Confidence to change:</u> Baseline: IG [8.12(SD=2.3)]; TAU [7.5(SD= 2.94)] ES: 0.2 (small effect) Across time: IG [8.15(SD=2.19)]; TAU [8.02(SD=2.83)] ES: 0.05 (no effect) **DV3:** Both groups reduced NOD SU by more than half	**LOE:** II **Strengths:** • High- level evidence • Concealed randomization • Significant results • Valid study with comprehensive lists of variables • Cost- effectiveness of BIMI performed • AR: 1.69% with explanation • ITT analysis was done to give unbiased estimate of tx effect considering lost to follow- up **Weaknesses:** • Weak power: 68 participants (34/group) required to have 90% power. The study only have 59 participants. • Only 21/30 participants in BIMI received intervention. 9 were lost to follow-up.

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			total of 202 beds over a 15-mo. Period. **IC:** ≥18 y/o with schizophrenia, schizoaffective or delusional DO, bipolar, recurrent depressive DO; service users of CMHS, new adm w/in acute phase of SMI; SU over the past mo. with >3 score on CDUS/CAUS in the past 3 mos.; Had a CC in a CMHT. **AR:** 1.69% (1)= withdrawn due to risk	**DV9:** Qualitative evaluation • B • FU (3 months)			Baseline: IG [21.48(SD=11)]; TAU [21.23(SD= 9.68)] ES: 0.02 (no effect) Follow-up: IG [9.25(SD=10.82)]; TAU [9.31(SD=11.86)] ES: -0.005 (no effect) NOD primary SU: RR 1.02 (95% CI=0.82-1.26; *p*=0.85) Number of SU: IG reduced by 0.34 when compared to TAU [OR 0.66 (95% CI=0.33-1.33; *p*=0.24)] **DV4: [IG(B/FU)/TAU (B/FU)]** CAUS (n=12/n=11) Baseline: IG [3.42(SD=0.67)]; TAU [3.27(SD= 0.65)] ES: 0.23 (small effect) Follow-up: IG [2.25(SD=1.22)]; TAU [2.18(SD=0.98)] ES: 0.07 (no effect) CDUS [n=18/(n=18/n=17)] Baseline: IG [3.33(SD=0.49)]; TAU [3.28(SD= 0.46)] ES: 0.11 (no effect) Follow-up: IG [1.89(SD=0.9)]; TAU [2.41(SD=1.06)] ES: -0.5 (moderate effect) AUDIT [(n=12/n=9)/n=11] Baseline: IG [22(SD=7.76)]; TAU [20(SD= 8.14)] ES: 0.2 (small effect) Follow-up: IG [15.11(SD=7.71)]; TAU [13.09(SD=7.92)] ES: 0.26 (small effect) SDS [(n=18/n=14)/(n=18/n=13)]	• Undiscussed between group characteristic difference • Participants were not blinded • Potential of clinician unblinding at 3-month follow-up. **Feasibility** • Good for use in practice however the implementation of booster session adherence a month after completion of treatment could be challenging (lack of staff to follow-up and deliver intervention after discharge)

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							Baseline: IG [4.56(SD=4.23)]; TAU [5.11(SD= 4.93)] ES: -0.11 (no effect) Follow-up: IG [4.64(SD=4.18)]; TAU [5.31(SD=3.68)] ES: -0.2 (small effect) **DV5**: HADS Anxiety (Difference in $\bar{x}$ -0.80 [95% CI=3.93-2.34; p=0.611)]: no treatment effect Depression (Difference in $\bar{x}$ -1.89 [95% CI=-4.51-0.74; p=0.156)]: modest effect on outcomes TAU >IG depression score **DV6:** RSQ Baseline: IG 'adopting an integration style' [71.14(SD=13.37)] TAU 'adopting a mixed picture, integration predominates' [66.54(SD=15.28)] Follow-up: Both acknowledge and attempt to cope with MHP IG 'integration style' [71.15(SD=18.97)] TAU 'integration style' [70.74 (SD=70.74)] **DV7:** Insight Scale Awareness of symptoms (Difference in $\bar{x}$ 0.03 [95% CI= -0.7-0.75; p=0.944) Awareness of illness (Difference in $\bar{x}$ 0.25 [95% CI=-0.42-0.93; p=0.459)	

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							Need for tx (Difference in $\bar{x}$ 0.09 [95% CI=-0.65-0.84; p=0.802) *increased in both groups overtime: "good insight" Total (Difference in $\bar{x}$ 1.03 [95% CI=-0.49-2.54; p=0.178) *difference in $\bar{x}$ implied benefit from BIMI, but with no significant differences **DV8:** EQ5D-5L (IG vs CG) (similar between groups) $\bar{x}$ cost of BIMI: £72 (SD=£66) $\bar{x}$ cost of services IG: £16,825 (SD=£12,159) $\bar{x}$ cost of services TAU: £15,698 (SD=£12,632) Contact w/ psychiatrist: n=19 vs n= 13 Contact w/ assertive outreach teams: n=7 vs n=1 **DV9:** BIMI feasible and acceptable per staff and participants; participants recognize SU and impact on MH; useful to engage patient in discussions	
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Major Variables & Definitions**	**Measurement**	**Data Analysis**	**Findings**	**Decision for Use in Practice/ Application to practice**
Health Quality Ontario.(2016). Interventions to improve access to primary care	Logic Model	**Design:** Systematic Review **Purpose:** To evaluate the	**N=** 5 **Demographics:** RCT (n=1)	**IV1**: Outreach programs: fixed or mobile + CO **IV2:** Housing and support services (CM)	• Grading of Recommendations Assessment, Development, and Evaluation	Data analysis not discussed	**IV1 on DV:** Significant increase in access to PCP **IV2 on DV:** Significant increase in access to PCP, MH provider,	**LOE:** I **Strengths:** • High level evidence • Significant findings

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for people who are homeless. A systematic review. **Country:** Canada **Funding:** None mentioned **Bias:** No identified bias or conflict of interest		effectiveness of interventions to improve access to PC for homeless individuals	Observational study (n=4) Total number of participants: 1,102 $\bar{x}$ age: 41-54 yrs M: 62-100% of participants **Setting:** Community sites, transitional housing facilities, supported housing, Housed by housing first >6 mos. **IC:** Full- text, English Studies published between Jan 1 1995 to July 2015 comparing interventions to improve access to PC, homeless adult or child, Quantitative, comparative studies **EC:** Studies evaluating effects of intervention based on number of PC visits, studies evaluating effects on psychiatric care, screening, prenatal/postnatal care, and SU tx without evaluating access to PCP **AR:** N/A	**IV3:** Integration of services **DV**: Access to healthcare provider	(GRADE) Working group criteria • Cochrane's Effective Practice and Organization of Care (EPOC) • National Heart, Lung, and Blood Institute criteria		and SUT provider. Significant increase in receipt of healthcare services **IV3 on DV:** Increased access to PCP but no significant difference with CG, however CG received CM support.	• Model stated • Risk of bias in studies was evaluated and quality of evidence assessed • Detailed description of search strategy **Weaknesses:** • Majority of studies used were observational studies • Possible heterogeneity between IG and CG • Limited generalizability **Feasibility:** Good for use in practice. Detailed explanation of interventions was outlined.

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/ Application to practice
Lenaerts et al. (2014). Continuing care for patients with alcohol use disorders: A systematic review. **Country:** Belgium **Funding:** KU Leuven, Belgian Federal Research Programme on Drugs **Bias:** No identified bias or conflict of interest	Inferred to be the Continuing Care Model of Substance Use Treatment, Chronic Care Model	**Design:** Systematic Review **Purpose:** To identify effective continuing care interventions for patients with AUDs	**N=** 6 **Demographics:** Total number of participants: 1,479 $\bar{x}$ Age: 40 yrs. Mostly M (63- 100%) Apart from 1 study, small proportion were single (17.5- 34%) **Setting:** Outpatient continuing care facility, rehabilitation facility **IC:** RCT; adults with AUD as primary problem, receiving tx in an OP, continuing care setting, interventions during initial rehabilitation programs with the aim of increasing care attendance, focus on tx of AUD, data on Alcohol use outcome or tx engagement, follow-up duration of at least 12 weeks after beginning the continuing care phase **EC:** <18 yrs., inmates or parolees, SMI o	**IV1**: Telephone calls **IV2:** Various psychotherapy (CBT, relapse prevention, MI, behavioral marital therapy, 12-step, interactional couples therapy) **DV1**: Alcohol use outcomes (% days abstinent, % patient abstinence, drinking severity, time to first drinking day) **DV2:** Tx engagement	• Cochrane Handbook for Systematic Reviews of Interventions • Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) • Cochrane Collaboration's risk of bias assessment tool • Microsoft Excel (pre-designed data extraction forms)	• Review Manager Software 5.1: to calculate relative risks for dichotomous outcomes and mean differences for continuous variables • Random effects model	**DV1:** % of patients continuously abstinent: 17% to 38.5% at 12 months, non- significant (RR:1.40, 95% CI= 0.84-2.33); Overall effect: Z=1.29, p=0.20 % of days abstinent: 39% to 99.4%, significant (RR:10.90 [8.83-17.96]; Overall effect: Z=3.02, p=0.003 Time to first drink: 1 study 81 days in favor of IG, 1 study 221 days in favor of CG Drinking severity: + results in favor of IG **DV2:** Trend towards better outcomes for tx attendance than CG	**LOE:** I **Strengths:** • High level evidence • Significant findings • Risk of bias in studies was evaluated and quality of evidence assessed • Detailed description of search strategy and study selection were discussed **Weaknesses:** • Limited generalizability • Meta- analysis could not be performed because of heterogeneity **Feasibility:** Good for use in practice. Detailed explanation of interventions was outlined.

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			other co- occurring SUD except nicotine, trials focusing on pharmacological approach **AR:** N/A					
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Major Variables & Definitions**	**Measurement**	**Data Analysis**	**Findings**	**Decision for Use in Practice/ Application to practice**
Lindahl et al. (2013). Case management in aftercare of involuntarily committed patients with substance abuse. A randomized trial. **Country:** Sweden **Funding:** Ministry of Health and Social Affairs task force, The National Board of Institutional Care, The Skane county administrative board	Transitional Case Management Model	**Design:** RCT **Purpose:** To examine the impact of CM on SU and use of service after d/c from court-ordered institutional care	**N=** 36 **TAU:** n= 23 (21 analyzed) **IG:** n= 13 **Demographics (TAU/IG):** $\bar{x}$ Age: 40/34 yrs. TAU F/M: 26%/74% IG F/M: 23%/77% MS (Single): 91%/ 100% Homelessness in the past 30 days: 40%/31% Alcohol: 60%/39% Drug: 40%/61% **Setting:** 3 SUT institutions (Hessleby, Lunden, and Karlsvik) in Skane, Sweden; 11 participating municipalities **IC:** Citizen in a participating municipality,	**IV:** CM (Initial meeting to agree with service plan; after d/c weekly meetings with CM, monthly meeting with Social work; Protocol in accordance with CCMSAT, KEY-CREST, and training manual by Swedish National Board of Health and Welfare for personal assistants) **DV1:** SU Abstinence **DV2:** Access to Care/ Use of Service after d/c	• ASI-X • AUDIT • AUDRUG • SIP • Time-line Follow-back • DSM IV-TR • SCL • GAF • Questionnaire Readiness to Change • MADRS • Involuntary care questionnaire	• SPSS version 17 • Fisher's Exact test: 1) to examine presence and absence of SU during the first 6 months in after care in relation to TAU (DV1), 2) to examine hospital use (DV2) • Chi- square test: 1) to examine differences among groups at the nominal level (DV2: type of care), 2) To test association between abstinence and access to care • Binary logistic regression: to analyze three dependent variables (institutional care, health/social	**(IG vs TAU)** **DV1:** 46% vs 14%, p=<0.05, ES: 0.35 (moderate) **DV2:** 92% vs 76%, p=0.23 Medical- assisted tx (p=0.46) Institutional/inpatient care (p=0.27) NOD in inpatient care (p=0.41) Subgroup analysis: Abstinent patients had fewer NOD in institutional and inpatient care (p=0.13); Continued SU had access to services at significant level	**LOE:** II **Strengths:** • High level evidence • Randomized sampling • Significant result • Model stated • No significant differences in baseline characteristics between groups • Comprehensive assessment of variables • AR: 5.56% with explanation **Weaknesses:** • Limited Generalizability • Small N • Risk for Type- 2 failure regarding access to care due to low number of participants

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Bias:. No identified bias or conflict of interest			committed to tx at one of the three participating institutions for court-ordered tx **AR:** 5.56% (2)= Deceased and declined			support, and medication-assisted care) • Mann- Whitney: 1) To examine the NOD in institution or hospital care, 2) to test NOD of inpatient treatment		• Unknown blinding **Feasibility:** • Good for use in practice however length of follow-up at 6 months may not be feasible
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Major Variables & Definitions**	**Measurement**	**Data Analysis**	**Findings**	**Decision for Use in Practice/ Application to practice**
O'Toole et al. (2015). Tailoring outreach efforts to increase primary care primary care use among homeless veterans: Results of a randomized controlled trial. **Country:** USA **Funding:** US Department of Veterans Affairs (Veterans Health Administration Health Services Research &	Behavioral model for vulnerable populations	**Design:** RCT **Purpose:** To examine whether PHA/BI or CO and in combination would increase the health- seeking behavior and receipt of care among homeless Veterans	**N=** 185 **TAU:** n= 62 **IG1 (PHA/BI):** n= 39 **IG2 (CO):** n= 40 **IG3 (PHA/BI+ CO)**: n= 44 **Demographics** Minority: 43% $\bar{x}$ Age: 48.6 yrs. M/F: 94.6%/ 5.4% No income/ <$500/month: 75% Unsheltered: 12% Dusk-to-dawn emergency shelter: 25.5% Transitional housing: 26.1% Unstable doubled- up arrangement: 27.7% Alcohol: 69.6% Cocaine: 12% Heroin: 3.3%	**IV1:** PHA/BI (20-30 mins: feedback and BI through MI based from H&P) **IV2:** CO (15-20 mins: transported to clinic; introduced to the clinic team; clinic orientation) **IV3:** PHA/BI+ CO **DV1:** Number of participants who accessed PC w/in 4 weeks of enrollment **DV2:** Receipt of healthcare services post- intervention during 6-month study period	• VA EHR • Face-to-face survey interview • Standardized surveys measuring self-efficacy, social support networks, readiness for change	• Descriptive statistics: to describe basic features of data in the study • ANOVA: To examine differences among groups (age, care usage by intervention) • Chi- square test: to examine variables at nominal level (done by group for receipt of PC at set intervals) • Fisher exact test: used when cell counts were to low to meet Chi-squared assumptions • Cox proportional-hazards regression survival analysis:	**(TAU/IG1/IG2/IG3)** **DV1:** 1-month FU:30.6%/41%/50%/77.3%, X^2 by group (p=<0.001) 6-month FU:37.1%/56.4%/80%/88.7%, X^2 by group (p=<0.001) <u>Cox- regression analysis:</u> IG2: Hazard ratio 2.64; 95% CI 1.54- 4.53 (significant) IG3: Hazard ratio 3.41; 95% CI 2.02-5.76 (significant) **DV2:** There was no significant difference in the subsequent number of PC (p=0.52), MH (p=0.06), or specialty care (p=0.0.11) visits per person across all four groups <u>IG1</u>**:** PC (ES:0.5- moderate); Specialty care consult (ES: 0.5- moderate effect); MH (ES: 0.92- large) <u>IG2</u>**:** PC (ES:0.25- small); Specialty care consult (ES: -	**LOE:** II **Strengths:** • High level evidence • Randomized sampling • Significant result • Model stated • No significant differences in baseline characteristics between groups • AR: 0 **Weaknesses:** • Limited Generalizability • Possible confounding variable in CO arm: Clinic w/in 2-3 mile-radius • Unknown blinding procedure

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Development Grant) **Bias:** No identified bias or conflict of interest			Perceived health status (poor or fair): 47.3% CMP: 72.7% MH: 71.6% Trauma victim: 16.9% **Setting:** Providence, Rhode Island and New Bedford, Massachusetts; 11 community sites and social service agencies **IC:** Homeless Veterans eligible to receive VA services; cognitively intact as measured by the Short Blessed test **EC:** Active cognitive impairment or delusional thought process that would impede capacity for health system navigation; Veterans receiving primary/continuity care from a VA-based provider w/in the last 6 mos. **AR:** 0			to analyze for time to treatment across all four groups • McNemar's test for correlated proportions: to compare personal motivations an reasons for no care between baseline and 6 months.	0.06- no effect); MH (ES: 0.04- no effect) IG3**:** PC (ES:0.35- small); Specialty care consult (ES: -0.09- no effect); MH (ES: 0.22- small)	**Feasibility:** • Good for use in practice however implementation of CO intervention may be challenging due to lack of staff, transportation issues, no partnership with PC

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/ Application to practice
Samet et al. (2003). Linking alcohol and drug dependent adults to primary medical care: A randomized controlled trial of a multi-disciplinary health intervention in a detoxification unit. **Country:** USA **Funding:** National Institute on Alcohol Abuse and Alcoholism, USPHS Grant **Bias:**. No identified bias or conflict of interest.	Primary Care Model with Integrative-distributive approach Inferred to be multidisciplinary care model and Transtheoretical model	**Design:** RCT **Purpose:** To assess the effectiveness of a novel multidisciplinary clinic for linking patients in a residential detoxification program to PC	**N=** 470 (468 analyzed) **CG:** n= 235 **IG:** n=235 (76% received full intervention, 18% partial intervention, 6% left) **Demographics:** Black: 46% Caucasian: 37% Hispanic: 11% Other: 6% $\bar{x}$ Age: 35.8 yrs. (18-60) M/F: 76%/24% Homelessness: 47% >1 DOC: 56% Alcohol: 63% Heroin: 31% Cocaine: 51% CMP: 47% **Setting:** Single free-standing residential detox unit in Boston, MA **IC:** Alcohol, heroin, or cocaine as primary DOC, >17 yrs., residence in proximity	**IV:** HELP Clinic • Multidisciplinary approach (RN, MD, and CM/Social work): each encounter lasted approximately 30 mins • MI • Facilitated referral **DV1:** PC linkage at 12 months **DV2:** SU Severity **DV3:** Health- related Quality of Life **DV4:** Utilization of medical and SU services **DV5:** HIV risk behaviors	• Alcohol breath test • FU interviews • Clinic records/HER • ASI • SF-36 Health survey (physical and mental component) • RAB (HIV sex and drug use risk scale scores) • Self-report of ED visits, hospitalization and detox episodes	• SAS/STAT software • ITT analysis: to preserve the sample size preventing reduced statistical power • Two-sample t-tests: to examine differences in baseline characteristics for continuous variables • Chi square test; 1) to examine differences in baseline characteristics for categorical variables, 2) to compare whether the proportion of subjects with FU differed between groups • Survival analysis, log rank test: to compare randomization group differences in time to linkage • Cox proportional hazards: to	**IG/CG** **DV1 (n=317):** 69%/53% [p=0.0003; Hazard ratio 1.8 (95% CI=1.3-2.4)] $\bar{x}$ number of visits in 12-month FU period: 4.7/4.9 (p=0.86) Alcohol-user (n=199): 72%/52% (p=0.0006) Cocaine/Heroine- user (n=247): 67%/54% (p=0.006) **Over 24-month FU period (DV2, DV3, DV4, DV5):** p=>0.2 (non-significant)	**LOE:** II **Strengths:** • High level evidence • Randomized sampling • Significant result • Model stated • Large N • AR: 0.42% with explanation • ITT analysis was done to give unbiased estimate of tx effect considering lost to follow- up • Baseline characteristics did not differ between groups **Weaknesses:** • Not current • Limited Generalizability • Unknown blinding procedure • Utilized self- report (questionable accuracy) • Lost to FU presence of missing data, however small

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			to the referral PC clinic or homelessness **EC:** Established PC relationship, mental deficiencies (<21 in MMSE score), plans to leave Boston area in the next 12 mos., inability to provide 3 contacts, pregnancy, not fluent in English or Spanish. **AR:** 0.42% (2) = Deceased			estimate the hazard ratio • Kaplan-Meier method: to calculate estimates of linkage • Longitudinal regression models: to test for intervention effects for correlated data controlling for baseline measures and time points • Generalized linear model for correlated data: for analysis involving continuous measures • Unstructured working covariance matrix: to account for correlation between repeated measures on the same subject • Wilcoxon rank sum test: to compare annual rates of utilization between group Two-tailed, alpha of <0.05		possibility that it biased results **Feasibility:** • Good for use in practice however length of follow-up at 6,12,18, and 24 months may not be feasible

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement	Data Analysis	Findings	Decision for Use in Practice/ Application to practice
Vederhus et al. (2014). Motivation intervention to enhance post-detoxification 12- Step group affiliation: A randomized controlled trial. **Country:** Norway **Funding:** None **Bias**: Possibility of confounding bias. No identified conflict of interest.	Transtheoretical model	**Design:** RCT **Purpose:** To compare MI focused on increasing involvement in 12-Step groups versus BA to attend TSGs	**N=** 140 **IG1 (MI):** n= 68 (56 analyzed) **IG2 (BA):** n=72 (57 analyzed) **Demographics (BA/MI):** Caucasian: 96% Other: 4% x̄ Age: 41 yrs. M/F: 67%/33% Lived alone: 47% x̄ yrs. of education: 11.2 SUD: 96% Alcohol: 38%/40% Drugs: 43%/43% Both: 19%/18% Yrs. of problematic use: >11 Previous SUD tx: 65% Previous TSG participation: 48% **Setting:** Detox department at an addiction unit in Sorlandet Hospital, Kristiansand, Norway **IC:** Not scheduled to receive inpatient tx or opioid maintenance tx	**IV1:** MI (2 weekly educational 30-minute sessions; 10-minute motivational DVD; encourage to make a call and invite TSG volunteers) **IV2:** BA (Brief advice to attend meeting; meeting lists; brochure) **DV1:** TSG Affiliation at 6 month FU **DV2:** Frequency of TSG attendance **DV3:** SU Severity	• AAAS • Semi-structured EuropASI • Frequency scales • ASI • MINI	• SPSS version 16 • Descriptive statistics: to describe basic features of data in the study • GEE regressions: to examine differences between groups • ES: to estimate marginal means and between group differences Significance level set at p=<0.05 *To account for possible imbalance between conditions due to small N, analyses were adjusted for baseline characteristics and baseline outcome measure value	**DV1 (AAAS):** IV1: 2.47(SE=0.3) IV2: 1.56 (SE=0.38) [0.91 adjusted point difference; 95% CI=0.04-1.78; p=0.041], 0.48 higher AAAS score at FU (beta=0.48; SE=0.09; p=<0.001) **DV2:** IV1: 16(SE=3.8) IV2: 8.2 (SE=2.2) [5.9 adjusted point difference; 95% CI=-1.4-13.2; p=0.115] **DV3:** <u>Alcohol-use in the last 30 days:</u> IV1: 2.2(SE=0.8) IV2: 5.4(SE=1.3) [-3.5 adjusted point difference; 95% CI=-6.5- -0.6; p=0.02] <u>Alcohol use severity (EuropASI):</u> IV1: 0.17(SE=0.03) IV2: 0.24 (SE=0.03) [-0.06 adjusted point difference; 95% CI=-0.14-0.01; p=0.095] <u>Drug-use in the last 30 days:</u> IV1: 4.8(SE=1.3) IV2: 7.4 (SE=1.6) [-4.0 adjusted point difference; 95% CI=-7.5- -0.4; p=0.028] <u>Drug use severity (EuropASI):</u> IV1: 0.11(SE=0.02) IV2: 0.1 (SE=0.01) [0.00 adjusted point difference; 95% CI=-0.03-0.03; p=0.862]	**LOE:** II **Strengths:** • High level of evidence • Significant results • AR with explanation • Comprehensive assessments of variables • Use of standardized instruments • FU completion by an interviewer blinded to assignment condition **Weaknesses:** • Lack of individual randomization • AR: 19.29% • Reliance on self-reports • Use of estimated number of TSG meetings to conduct the sample size calculation • Possibility of confounding factor (intensity of intervention 1 hour vs few minutes)

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			after detox, remained in detox sufficiently long for assessment, planned d/c to home **EC:** SMI, cognitive impairment, no access to at least 1 TSG within 30 km of home **AR:** 19.29% (22 lost to follow-up, 3 deceased, 2 refused)				<u>Abstinence rate:</u> Participants who attended TSG meetings: 62% Non-attendees: 26% (X^2=14.5, p=<0.001)	• Limited generalizability • No correction was made for inflated type I error associated with multiple comparisons of secondary outcomes **Feasibility:** Good for use in practice however length of follow-up at 6 months may not be feasible
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Major Variables & Definitions**	**Measurement**	**Data Analysis**	**Findings**	**Decision for Use in Practice/ Application to practice**
Weisner et al. (2016). Examination of the effects of an intervention aiming to link patients receiving addiction treatment with healthcare: The LINKAGE clinical trial. **Country:** USA **Funding:** National Institutes of	Inferred to be Social Cognitive Theory and Health Promotion Model	**Design:** NRCT **Purpose:** To examine the effects of an intervention aiming to link patients receiving addiction tx in HC	**N=** 503 **CG:** n= 251 **IG:** n=252 (six 45-minute group-based, manual-guided sessions: 2/week; practiced skills necessary for collaborative communication) **Demographics (CG/IG):** Caucasian: 59.8%/61.9% Hispanic: 20.7%/19.4% African American: 8%/6.7%	**IV:** LINKAGE intervention • Group-based, manual guided sessions on patient engagement • EHR use • Facilitated physician communication **DV1:** Patient activation **DV2:** Patient engagement in HC **DV3:** SU Abstinence **DV4:** Depression outcomes	• Telephone interviews • HER • Patient Activation Measure • ASI • National Institute on Alcohol Abuse and Alcoholism evidence-based questionnaire • PHQ-9 Two-tailed, alpha level of 0.05	• SAS version 9.3 • ITT analysis: to preserve the sample size preventing reduced statistical power • Longitudinal Poisson regression models with quasi likelihood approach: to analyze patient portal use • General linear regression: 1) to examine comparability between conditions on baseline	**IG/CG** **DV1:** Full sample: [129 of 225 (57.3%)] vs [116 of 230 (50.4%)], p=0.14 Subsample with MHP: [104 of 172 (60.5%)] vs [92 of 182 (50.6%)], p=0.06 **DV2:** <u>Patient portal use</u> IG showed 1.53-fold increase in $\bar{x}$ number of log-in days (IRR: 1.53; 95% CI=1.19-1.97; p=0.001) $\bar{x}$ number of log-in days for medical advice (IRR: 1.55; 95% CI=1.13-2.11; p=0.006)	**LOE:** III **Strengths:** • Baseline characteristics did not differ between groups • Valid study • Significant results • AR=0 • Comprehensive assessments of variables • Use of standardized instruments • Large N **Weaknesses:**

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Health Center Grant from NIDA **Bias:** No identified bias and conflict of interest.			Asian: 7.2%/6.3% Other: 4.4%/5.6% x̄ Age: 42.5 yrs. M/F: 69%/31% ≤HS or GED= 42.6%/38.1% Alcohol: 47%/42.5% Drugs: 26.7%/24.2% Both: 16.3%/25% MH (moderate to severe depression): 13.5%/15.1% **Setting:** San Francisco OP addiction tx clinic of Kaiser Permanente **IC:** ≥18 yrs. deemed eligible by physicians after completing a 10-day stabilization program **EC:** Severe cognitive disability, SMI **AR:** 0	**DV5:** Effects of the number of linkage sessions **DV6**: Effects of facilitated physician communication FU:6 months		characteristics for continuous variables, 2) to examine the intervention effect on nonportal outcomes at 6 months for continuous measures • Chi- square test: To examine comparability between conditions on baseline characteristics for categorical variables • Logistic regression: to examine the intervention effect on nonportal outcomes at 6 months for binary measures • Bonferroni correction: to account for multiple comparisons • Exploratory analysis: to examine the effect of the number of LINKAGE sessions attended and facilitated	x̄ number of messages sent by HC professional (IRR: 1.45; 95% CI=1.08-1.94; *p*=0.02) x̄ number of log-in days for lab results review (IRR: 1.92; 95% CI=1.43-2.56; *p*=<0.001) x̄ number of log-in days for lab test information (IRR: 1.89; 95% CI=1.43-2.51; *p*=<0.001) Subsample with MHP: IG showed significantly higher use of each activity <u>PCP communication about SUD:</u> IG had twice the odds of communicating with PCP about SUD (OR 2.30; 95% CI=1.00-2.57; *p*=0.05) **DV3:** Full sample (OR 1.17; 95% CI=0.79-1.75; *p*=0.43) and subsample with MHP (OR 2.05; 95% CI=0.7-6.06; *p*=0.19) *Both groups had high SU abstinence rates at 6 mos. w/o significant differences between conditions **DV4:** IG (PHQ-9 dropped from 15.1% to 8%); CG (PHQ-9 dropped from 13.5% to 7%) *No significant differences between conditions **DV5 (IG >6 vs <6 sessions):** Significantly higher patient portal use, alcohol abstinence rates (83.7% vs 71.7%; *p*=0.03), total abstinence rates (77.6% vs	• Non-randomized trial • Patient activation may have been underpowered • Did not include biological specimens in FU **Feasibility:** Good for use in practice but may have challenges with intervention implementation (system changes, lack of staff, follow-up in 6 months)

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						physician communication on each outcome	65.4%, *p*=0.05), and longer tx retention (103 vs 60 days; *p*=<0.001) **DV6:** Significantly more communicated with PCP regarding SU, longer tx retention (92 vs 49.3 days, *p*=<0.001), better alcohol abstinence (82% vs 62.7%, *p*=<0.001), and less heavy drinking (8.9% vs 26.9%, *p*=<0.001)	
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Major Variables & Definitions**	**Measurement**	**Data Analysis**	**Findings**	**Decision for Use in Practice/ Application to practice**
Zanjani et al. (2015). Management of psychiatric appointments by telephone. **Country:** USA **Funding:** National Institute of Health **Bias:** No identified bias and conflict of interest.	Inferred to be Transtheoretical model	**Design:** RCT **Purpose:** To examine a system for PAM in community patients	**N=** 39 **CG:** n= 20 **IG:** n=19 **Demographics:** Racial minority: 14% x̄ Age: 43 yrs. M/F: 51%/49% *Most were white, married, lives alone, with full-time work. x̄ Income: $42,000 Yrs. of education: 15 yrs. **Setting:** University of Kentucky OP Psychiatric clinic **IC:** Not receiving psychiatric care in the previous yr, 2-week	**IV:** TBI-BMI (PAM) (Brief MI for 15- 20 mins; completed workbook; appointment reminder; letter to reinforce tx engagement; rescheduling appointment) **DV1:** Tx attendance **DV2:** Depression **DV3:** Psychiatric symptoms **DV4:** Psychiatric comorbidity **DV5:** Quality of Life/ Functioning **DV6:** Perceived tx barriers FU: 6 months	• Clinic records • Brief depression severity measure • Brief symptom Inventory • MINI • SF-36 • Treatment barriers inventory	• Linear mixed models: for analysis involving continuous measures • Other statistics used not discussed	**IG/CG** **DV1:** Attendance at initial appointment (90% vs 60%, *p*=0.035) Total number of appointments attended: at 6 (3 vs 2.5, *p*=0.63) and 12 months (3.7 vs 3.2, *p*=0.64) Attending at least 3 appointments (58% vs 42%, *p*=0.26) **DV2:** *p*=<0.001 **DV3:** *p*=<0.001 **DV4:** *p*=0.004 **DV5:** Physical functioning (*p*=0.56); Mental functioning (*p*=<0.001) **DV6:** *p*=0.3	**LOE:** II **Strengths:** • High level of evidence • Randomized • Valid study with comprehensive assessments of variables • Baseline characteristics did not differ between groups • Use of standardized instruments • AR=0 **Weaknesses:** • Unknown blinding procedures • Small N

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			window between recruitment and first appointment **AR:** 0					• Unknown cost-benefit ratio **Feasibility:** • Good for use in practice however length of follow-up at 6 months may not be feasible

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Appendix F

Table 2

Synthesis Table

Authors											
	Acquavita	Blodgett	Graham	Health Quality Ontario	Lenaerts	Lindahl	O'Toole	Samet	Vederhus	Weisner	Zanjani
Year	2013	2014	2016	2016	2014	2013	2015	2003	2014	2016	2015
Country	USA	USA	UK	Canada	Belgium	Sweden	USA	USA	Norway	USA	USA
Study Characteristics											
Design/ LOE											
MA- SR/I		X		X	X						
RCT/II			X			X	X	X	X		X
NRCT/III	X									X	
Setting											
SATF	X	X			X	X		X	X	X	
PF			X								X
CS/SSA				X			X				
Demographics											
Sample Size	260	3542	59	1102	1479	36	185	470	140	503	39
Mean Age and Gender											
Young adult (18-35 years)		X						X			
Middle- aged (36-55 years)	X		X	X	X	X	X		X	X	X
M>F	X	X	X	X	X	X	X	X	X	X	X

AAAS- AA Affiliation Scale, **AUDIT**- Alcohol Use Disorder Identification Test, **ASI**- Addiction Severity Index, **BA**- Brief Advice**, BIMI**- Brief Integrated Motivational Intervention, **CBT**- Cognitive behavioral therapy, **CC**- Continuing Care, **CDUS/CAUS**- Clinicians Alcohol/Drugs Use Rating Scale, **CM**- Case Management, **CO**- Clinic Orientation, **CS**- Community Sites, **CSI**- Contracting with Staff Incentives, **CSRI**- Client Service Receipt Inventory, **F**- Female, **GAF**- Global Assessment Functioning Scale, **HADS**- Hospital Anxiety and Depression Scale, **HC**- Healthcare, **LOE**- Level of Evidence, **M**- Male, **MA**- Meta- analysis, **MADRS**- Montgomery- Asberg Depression Rating Scale, **Me**- Moderate effect, **MET**- Motivational Enhancement Therapy, **MH**- Mental Health, **MI**- Motivational Interviewing, **MINI**- Mini International NeuroPsychiatric review, **ND**- Not discussed, **NRCT**- Non-randomized controlled trial, **OP**- Outpatient, **ORP**- Outreach programs **PF**- Psychiatric Facility, **PT**- Psychotherapy, **RCT**- Randomized controlled trial, **S- SATF**- Substance Abuse Treatment Facility, **SATs**- Substance Abuse Treatment Scale, **SDS**- Severity of Dependence Scale, **Se**- Small effect, **SIP**- Short- index of problems, **SR**- Systematic Review, **SSA**- Social Service Agencies, **SU**- Substance Use, **T**- Transport, **TBI**- Telephone- based intervention, **TSF**- Twelve step Facilitation, *Significant findings, ↑ Increased, ↓ Decreased, ≠ Not clinically significant, = No difference, + Positive effect

Primary Substance- Used														
Alcohol		X		ND	ND	X	X			X		X	ND	
Drugs	X		X								X			
Intervention and Included Component of Facilitated Referral														
	CI	CSI	CC	BIMI	ORP+CO	TBI + PT	CM	PHA-BI	CO	PHA/BI+ CO	HELP clinic	MI compared to BA	LINKAGE	TBI-MI
Health Assessment				X	X		X	X	X	X	X		X	
Individualized education utilizing PT		X (MI)	X (CBT; CBT-like; MET/MI; Counselling)	X (CBT; MI)	X (MI)	X (CBT; MI; MET, TSF, etc.)	X	X (MI)	X (MI)	X (MI)	X (MI)	X(MI)	X (Patient activation)	X (MI)
• Impact to health and importance of follow-up adherence		X	ND	X	X	X		X	X	X	X	X	X	X
• Barrier identification, problem-solving, goal discussion, communication skills				X	X	X	X					X	X	X
• OP clinic		X			X				X	X				X
Managing appointments	X	X	ND		ND	X					X	X		X
• Scheduling	X	X				X					X	X		X
• Reminder											X			X
• Follow-up if missed	X	X												X
Financial incentives	X	X												

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Contracting		X					X						X
Referral letter with patient information										X			
Peer mentor and other support	X (T)	X (T)		X	X (CM; T)	X (RN)	X (CM)		X (T)	X (T)				
Patient EHR Utilization												X	
Length of intervention													
15- 30 minutes	X	X	ND	X			ND	X	X		X	X		X
31- 45 minutes										X			X	
Frequency and Duration of sessions	1 prior to d/c		Majority: Duration were 3 months	4-6 in 2 weeks +1 booster a month after d/c	Variable	Majority were 1- 2/ week	1 every week	1			3	2/ week	6 in 3 weeks	1 (2 weeks prior to appointment)
Follow- up														
30 days	X				Variable	Variable		X						
3 months			X	X										
6 months							X	X			X	X	X	X
>6 months							X				X			X
Instruments														
Clinic records, Client self- report and EHR	X			X				X			X		X	X
CSRI				X										
SATs				X										
Motivational Scale				X										
Stages of Change Readiness and Tx Eagerness scale				X			X	X						

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CDUS/CAUS			X									
SDS			X									
AUDIT			X			X						
GAF						X						
Insight scale			X									
HADS			X									
DSM IV						X						
ASI						X			X	X	X	
PHQ-9											X	
MADRS						X						
Self- efficacy							X					
AAAS										X		
MINI										X		X
Patient Activation Measure											X	
Brief depression Severity measure												X
Tx Barrier Inventory												X

Findings														
	CI	CSI	CC	BIMI	ORP+CO	TBI + PT	CM	PHA-BI	CO	PHA/ BI+ CO	HELP clinic	MI compared to BA	LINKAGE	TBI-MI
Access and follow up adherence to HS	≠↑	*↑			*↑			≠↑	*↑	*↑	*↑	*↑		*↑
Continued aftercare engagement	*↑	≠↑	*+ Se	*↑ Se		↑	≠↑	≠↑	≠	≠	≠	≠↑	*↑	≠↑
Time to initial contact	=	*↓ Se												
Receipt of OP appointment	*↑	*↑												

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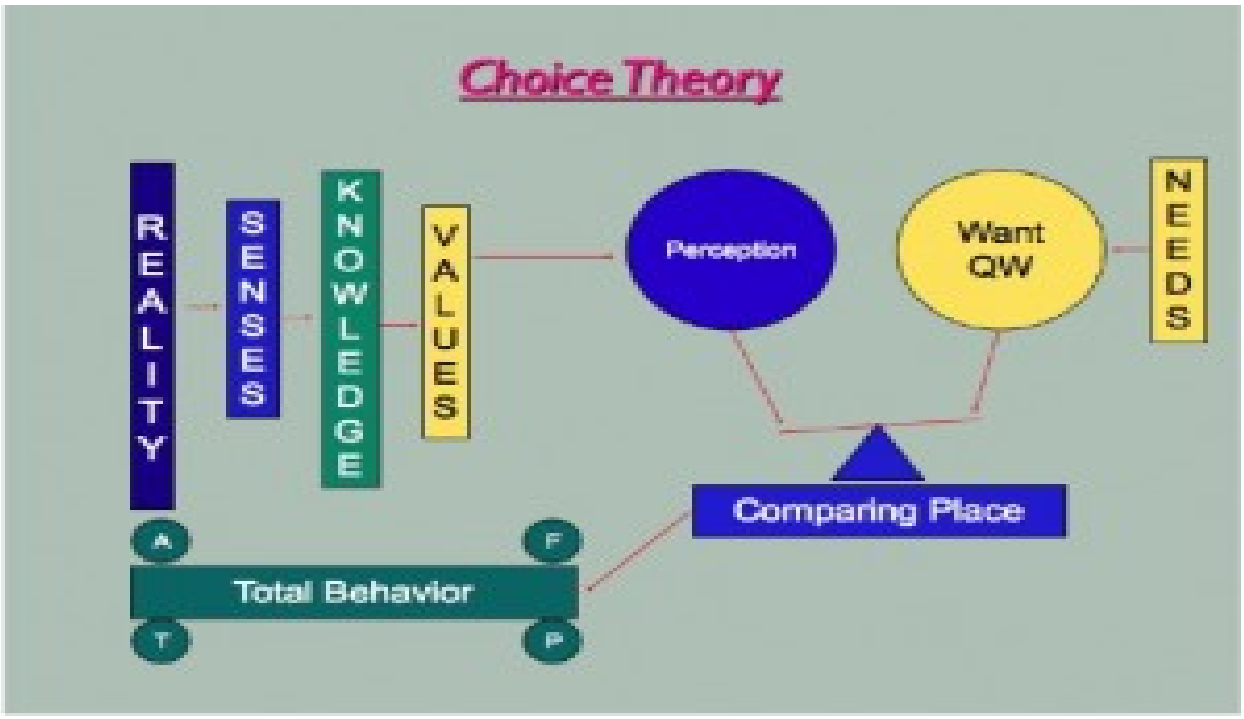
Time to OP appointment	=	*↓ Me												
Tx Admission	*↑	*↑												
SU Outcomes			*+ Se	+		*+	*+ Me				≠	*+	+	
PT effect on SU Outcomes			*+Se											
MH Outcomes				+									+	*+
Duration of tx			≠											
Intensity of tx			≠											

AAAS- AA Affiliation Scale, **AUDIT**- Alcohol Use Disorder Identification Test, **ASI**- Addiction Severity Index, **BA**- Brief Advice, **BIMI**- Brief Integrated Motivational Intervention, **CBT**- Cognitive behavioral therapy, **CC**- Continuing Care, **CDUS/CAUS**- Clinicians Alcohol/Drugs Use Rating Scale, **CM**- Case Management, **CO**- Clinic Orientation, **CS**- Community Sites, **CSI**- Contracting with Staff Incentives, **CSRI**- Client Service Receipt Inventory, **F**- Female, **GAF**- Global Assessment Functioning Scale, **HADS**- Hospital Anxiety and Depression Scale, **HC**- Healthcare, **LOE**- Level of Evidence, **M**- Male, **MA**- Meta- analysis, **MADRS**- Montgomery- Asberg Depression Rating Scale, **Me**- Moderate effect, **MET**- Motivational Enhancement Therapy, **MH**- Mental Health, **MI**- Motivational Interviewing, **MINI**- Mini International NeuroPsychiatric review, **ND**- Not discussed, **NRCT**- Non-randomized controlled trial, **OP**- Outpatient, **ORP**- Outreach programs **PF**- Psychiatric Facility, **PT**- Psychotherapy, **RCT**- Randomized controlled trial, **S**- **SATF**- Substance Abuse Treatment Facility, **SATs**- Substance Abuse Treatment Scale, **SDS**- Severity of Dependence Scale, **Se**- Small effect, **SIP**- Short- index of problems, **SR**- Systematic Review, **SSA**- Social Service Agencies, **SU**- Substance Use, **T**- Transport, **TBI**- Telephone- based intervention, **TSF**- Twelve step Facilitation, *Significant findings, ↑ Increased, ↓ Decreased, ≠ Not clinically significant, = No difference, +- Positive effect

Appendix G

Model 1

Choice Theory by Glasser



Appendix H

Model 2

Model of Transitions from Addiction Treatment to Primary Care

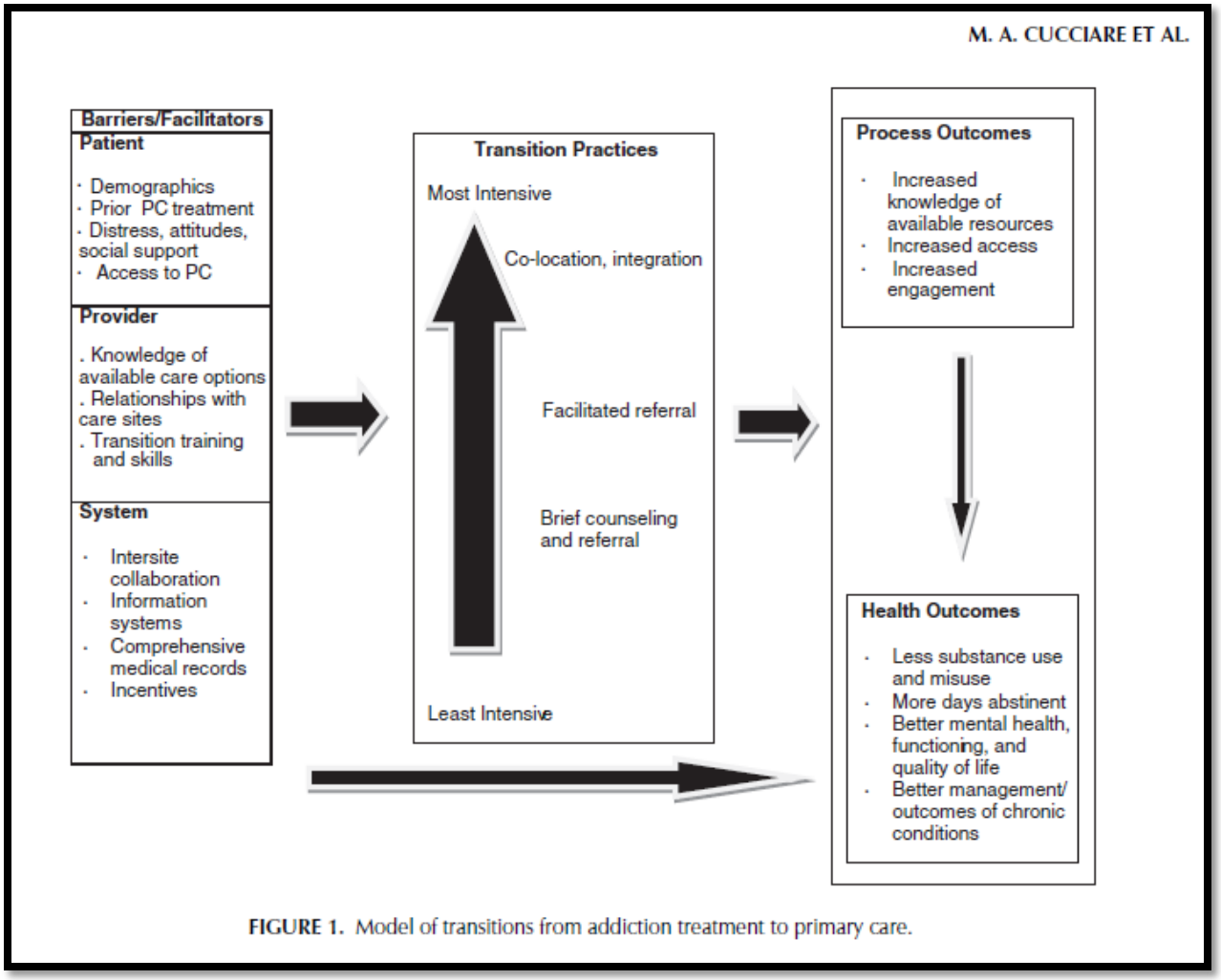
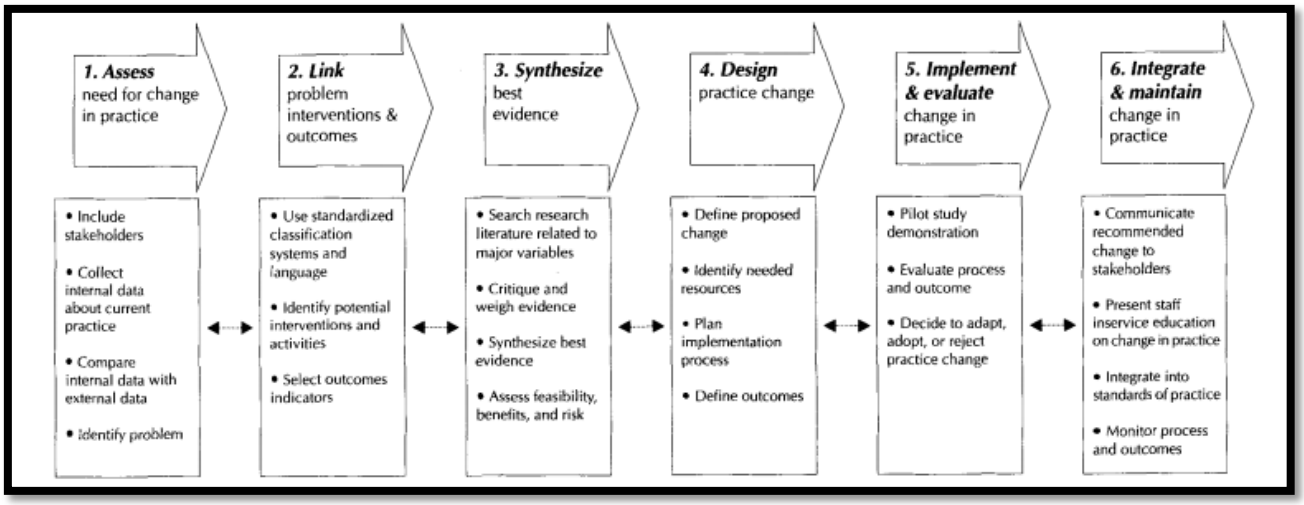


FIGURE 1. Model of transitions from addiction treatment to primary care.

Appendix I

Model 3

The Model for Evidence-Based Practice Change by Rosswurm and Larabee



Appendix J

Document 1

Institutional Review Board Approval Letters

ASU Knowledge Enterprise Development

APPROVAL: EXPEDITED REVIEW

Carol Moffett
CONHI - DNP
-
Carol.Moffett@asu.edu

Dear Carol Moffett:

On 9/8/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Improving the Care Transition to Outpatient Aftercare Services Following Addiction Treatment
Investigator:	Carol Moffett
IRB ID:	STUDY00006648
Category of review:	(5) Data, documents, records, or specimens, (7)(a) Behavioral research
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Health Leads Survey, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Demographic Questionnaire, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • AWARE Questionnaire, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • HIPAA-SHOW, Category: Other (to reflect anything not captured above); • Flyer, Category: Recruitment Materials; • Educational Outline, Category: Other (to reflect anything not captured above); • Consent to behavioral treatment, Category: Other (to reflect anything not captured above); • Consent form, Category: Consent Form;

	• Social Behavioral Protocol, Category: IRB Protocol; • Letter of Support, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • Consent to treat (SHOW), Category: Other (to reflect anything not captured above); • Data Collection Form, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • HIPAA-SHOW acknowledgement, Category: Other (to reflect anything not captured above); • Message Reminder, Category: Technical materials/diagrams;

The IRB approved the protocol from 9/8/2017 to 9/7/2018 inclusive. Three weeks before 9/7/2018 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 9/7/2018 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Roxanne Carla Tenorio
Roxanne Carla Tenorio
Carol Moffett
Bonnie Ervin
Susan Harrell
Christa Moore

ASU Knowledge Enterprise Development

APPROVAL: MODIFICATION

Carol Moffett
CONHI - DNP
-
Carol.Moffett@asu.edu

Dear Carol Moffett:

On 9/25/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Modification
Title:	Improving the Care Transition to Outpatient Aftercare Services Following Addiction Treatment
Investigator:	Carol Moffett
IRB ID:	STUDY00006648
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Educational Outline, Category: Other (to reflect anything not captured above); • Social Behavioral Protocol, Category: IRB Protocol; • Consent to behavioral treatment, Category: Other (to reflect anything not captured above); • HIPAA-SHOW acknowledgement, Category: Other (to reflect anything not captured above); • Message Reminder, Category: Technical materials/diagrams; • AWARE Questionnaire, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Consent to treat (SHOW), Category: Other (to reflect anything not captured above); • Letter of Support, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • Demographic Questionnaire, Category: Measures (Survey questions/Interview questions /interview

	guides/focus group questions); • HIPAA-SHOW, Category: Other (to reflect anything not captured above); • Health Leads Survey, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Flyer, Category: Recruitment Materials; • Consent form, Category: Consent Form; • Data Collection Form, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);

The IRB approved the modification.

When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Roxanne Carla Tenorio
Roxanne Carla Tenorio
Carol Moffett
Bonnie Ervin
Susan Harrell
Christa Moore

ASU Knowledge Enterprise Development

APPROVAL: MODIFICATION

Carol Moffett
CONHI - DNP
-
Carol.Moffett@asu.edu

Dear Carol Moffett:

On 10/19/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Modification
Title:	Improving the Care Transition to Outpatient Aftercare Services Following Addiction Treatment
Investigator:	Carol Moffett
IRB ID:	STUDY00006648
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Educational Outline, Category: Other (to reflect anything not captured above); • Social Behavioral Protocol, Category: IRB Protocol; • Consent to behavioral treatment, Category: Other (to reflect anything not captured above); • HIPAA-SHOW acknowledgement, Category: Other (to reflect anything not captured above); • Message Reminder, Category: Technical materials/diagrams; • AWARE Questionnaire, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Consent to treat (SHOW), Category: Other (to reflect anything not captured above); • Letter of Support, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • Demographic Questionnaire, Category: Measures (Survey questions/Interview questions /interview

	guides/focus group questions); • HIPAA-SHOW, Category: Other (to reflect anything not captured above); • Health Leads Survey, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Flyer, Category: Recruitment Materials; • Consent form, Category: Consent Form; • Data Collection Form, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);

The IRB approved the modification.

When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Roxanne Carla Tenorio
Christine Creen
Roxanne Carla Tenorio
Carol Moffett
Bonnie Ervin
Susan Harrell
Christa Moore

Appendix K

Table 3

Proposed Budget

Projected Costs		
	Expenses	**In-kind support**
Personnel		
Project Director $30/hour for 5 hours per week x 24 weeks		$3,600.00
Advanced primary care provider (NP/PA) $50/hour for 5 hours per week x 20 weeks		$5,000.00
Advanced psychiatric nurse practitioner $50/hour for 5 hours per week x 20 weeks		$5,000.00
Social worker $22/hour for 5 hours per week x 20 weeks		$2,200.00
Office Staff $19/hour for 6 hours per week x 20 weeks		$2,280.00
Software Developer $18/hour for 6 hours x 4 weeks		$432.00
Resident's time 15 minutes x stay in weeks plus 4 weeks	No cost because patient lives in residential facility and interventions will not interfere with patients' schedules	
Equipment and supplies		
Printed forms, research tools, and educational materials -Computer/Laptop -Tablet -Relapse prevention card -Educational tool -Researcher phone +6 month prepaid **Cellphone**	 $20.00 $100.00 $200.00	 $250.00 $100.00 $80.00
Total expenses	**$320.00**	**$18,942.00**

Appendix L

Instrument 1

Demographic Questionnaire

Please fill in the blank or check the appropriate box for each of the following questions.

1. What is the reason for your admission?
   ☐ Mandated to treatment/ Pre-trial ☐ Voluntary ☐ Other: _____

2. In what program are you enrolled?
   ☐ Right track phase I ☐ Right track phase II ☐ Intensive Outpatient program

3. Do you have prior history of addiction treatment? ☐ No ☐ Yes
4. Have you ever been imprisoned or incarcerated? ☐ No ☐ Yes
   If yes, were you in prison just before entering the program? ☐ No ☐ Yes

5. Have you ever been homeless? ☐ No ☐ Yes
6. What is your primary substance of choice?

   ☐ Alcohol ☐ Ecstasy ☐ Methamphetamines
   ☐ Opioids ☐ Cocaine ☐ Bath salts
   ☐ Benzodiazepines ☐ Heroin ☐ Marijuana
   ☐ Others: _____

7. What is your secondary substance of choice?

   ☐ Alcohol ☐ Ecstasy ☐ Methamphetamines
   ☐ Opioids ☐ Cocaine ☐ Bath salts
   ☐ Benzodiazepines ☐ Heroin ☐ Marijuana
   ☐ Others: _____

8. Presence of medical health condition(s)? ☐ No ☐ Yes
   If yes, select all that apply:
   ☐ Hypertension ☐ Diabetes ☐ Cancer
   ☐ Hyperlipidemia ☐ Thyroid problems ☐ Hepatitis
   ☐ Heart Failure ☐ Chronic Back problems ☐ Liver cirrhosis
   ☐ Asthma ☐ Arthritis ☐ Sexually Transmitted Illnesses
   ☐ COPD ☐ Irritable bowel syndrome ☐ Insomnia
   ☐ Psoriasis ☐ Crohn's disease ☐ Chronic Kidney Disease
   ☐ Seizure Disorder ☐ Others: _____

9. Presence of psychiatric condition(s)? ☐ No ☐ Yes
   If yes, select all that applies:
   ☐ Depression ☐ ADHD/ADD ☐ Eating disorder
   ☐ Anxiety disorders ☐ PTSD ☐ Bipolar disorder

☐ Others: _____

10. Do you have a smart phone? ☐ No ☐ Yes

11. Contact information:
    a. Personal contact information (*This will be used if you are not responding or not eligible to enroll in iTether)*
    - Preferred way to contact you for appointment reminders (*May choose more than one)*:
      ☐ Text: _____ (cell phone number) ☐ E-mail: _____
    - Preferred way to contact you for follow-ups (*May choose multiple)*:
      ☐ Text: _____ (cell phone number) ☐ E-mail: _____
      ☐ Call (landline/cellular): _____ (landline or cellphone number)

    b. Provide at least two trusted contact persons: (*This will be used only if you cannot be reached)*

    - First Name: _____Relationship: _____
      Contact no: _____
    - First Name: _____Relationship: _____
      Contact no: _____
    - First Name: _____Relationship: _____
      Contact no: _____

Appendix M

Instrument 2

DNP Data Collection Form

Pre- intervention data collection (Needs Assessment: Completed by the researcher)

1. What is the status of primary care relationship?

   ☐ Has established relationship with one PCP
   ☐ Has established relationship with one PCP but last appointment was >2 years ago
   ☐ Has established relationship with one PCP but requests a different provider
   ☐ Has established relationship with one PCP but has issues with location
   ☐ Has no established relationship with one PCP and needs linkage
   ☐ Has multiple PCPs
   ☐ Others: _____

2. What is the status of psychiatric provider relationship? (*Skip if not applicable)*

   ☐ Has established relationship with one psychiatric provider
   ☐ Has established relationship with 1 psych provider but last appointment was >2 yrs ago
   ☐ Has established relationship with one psychiatric provider but requests a different one
   ☐ Has established relationship with one Psychiatric provider but has issues with location
   ☐ Has no established relationship with one psychiatric provider and needs linkage
   ☐ Has multiple psychiatric providers
   ☐ Others: _____

3. What is the sponsorship status?

   ☐ Has established relationship with a sponsor
   ☐ Has no established relationship with a sponsor
   ☐ Unable to contact sponsor
   ☐ Requests a different sponsor
   ☐ Others: _____

4. Are there other social work/community aftercare needs? (*Select all that apply)*
   ☐ Access to dental care
   ☐ Access to vision care
   ☐ Access to AA/NA meetings after discharge or other community recovery support groups
   ☐ Needs sober living arrangement
   ☐ Needs linkage with individual/family counselling services
   ☐ Needs legal services
   ☐ Others: _____

Intervention data collection (Completed by the researcher)

1. Weekly educational sessions received (*At least 15 minutes per session)*:
   ☐ Date: ___/___/___ ☐ Date: ___/___/___ ☐ Date: ___/___/___

☐ Date: ___/___/___ ☐ Date: ___/___/___ ☐ Date: ___/___/___
☐ Date: ___/___/___ ☐ Date: ___/___/___ ☐ Date: ___/___/___
☐ Date: ___/___/___ ☐ Date: ___/___/___ ☐ Date: ___/___/___

2. What are the support services and resource tools provided to help access and increase follow-up adherence to needed outpatient aftercare services?
   - ☐ Resources provided regarding:
     - ☐ Food assistance provided in the community
     - ☐ Housing
     - ☐ Utility payment assistance
     - ☐ Financial Assistance
     - ☐ Transportation
     - ☐ Domestic violence/Trauma assistance and resources
     - ☐ Assistance with Childcare
     - ☐ Health literacy/Education needs
     - ☐ Employment resources and linkage support
     - ☐ Mental/Behavioral health resources
     - ☐ Community clubs/ Church
     - ☐ Dental care resources
     - ☐ Eye care resources
     - ☐ Counselling resources
     - ☐ Legal services
   - ☐ Consulted Social Work
   - ☐ Insurance application support
   - ☐ Access to directory of providers covered by insurance (Primary care and/or Psych services)
   - ☐ Support with appointment scheduling and management
   - ☐ List of AA/NA meetings scheduled post- discharge
   - ☐ List of sponsors
   - ☐ Discharge tools:
     - ☐ Relapse prevention card
     - ☐ Post-discharge appointment schedule form/ iTether calendar
   - ☐ Others: _____
3. Number of PCP appointments while admitted: _____
4. Number of psychiatric appointments while admitted: _____
5. Number of sponsor meetings while admitted (1 hour/week): _____

Post- intervention data collection

1. <u>Post-discharge:</u>

   ■ Prior to discharge

- Do you have an appointment scheduled with your primary care doctor after leaving the program? ☐Yes ☐No ☐N/A
  If yes, date of appointment after discharge: _____
  PCP: _____ City/Zip code: _____

Contact number: _____

If no, what is the reason: _____

- Do you have an appointment scheduled with your mental health provider after leaving the program? ☐ Yes ☐ No ☐ N/A
  If yes, date of appointment after discharge: _____
  PCP: _____ City/Zip code: _____
  Contact number: _____

  If no, what is the reason: _____

- Do you have a sponsor? ☐ Yes ☐ No
  If yes, date of first meeting after discharge: _____
  If no, what is the reason: _____

- Do you have a scheduled AA/NA meeting to attend? ☐ Yes ☐ No ☐ N/A
  If yes, date of first AA/NA meeting after discharge: _____
  If no, what is the reason: _____

- What other community assistance were you able to access? (Check all that apply)

☐ Food Assistance	☐ Utility payment assistance	☐ Financial assistance
☐ Insurance	☐ Counseling services	☐ Domestic violence support
☐ Housing	☐ Employment	☐ Transportation
☐ Legal services	☐ Sober living arrangement	☐ Education opportunities
☐ Dental services	☐ Vision/ Eye glasses	☐ Child care services
☐ Social support (Community clubs/ Church)		☐ Others: _____

** *If other identified needs were not successfully provided,* what are the reasons?:

_____

a. Did you decide to extend your stay at Crossroads? ☐ Yes ☐ No
   What is your total length of stay in the facility?
   ☐ 30 days ☐ 60 days ☐ 90 days ☐ Other: _____

b. Where will you be discharged?
   ☐ IOP ☐ Sober living ☐ Home ☐ Prison ☐ Other: _____

■ Within 30 days of discharge

a. Did you attend your scheduled appointments with your:
   - Primary care provider ☐ Yes ☐ No ☐ N/A
     If no, what is the reason: _____
     education provided and appointment rescheduled? ☐ Completed
   - Psychiatric provider ☐ Yes ☐ No ☐ N/A
     If no, what is the reason: _____
     education provided and appointment rescheduled? ☐ Completed

- Sponsor meeting ☐Yes ☐No
  If no, what is the reason: _____
  education provided and encouraged participant to call sponsor? ☐Completed

- First AA/NA after discharge ☐Yes ☐No
  If no, what is the reason: _____
  education provided and signed up to another meeting? ☐Completed

b. After attending your first appointment after discharge, did you schedule your next appointment with your:

- Primary care provider ☐Yes ☐No ☐N/A
  If no, what is the reason: _____

- Psychiatric provider ☐Yes ☐No ☐N/A
  If no, what is the reason: _____

- Sponsor meeting ☐Yes ☐No
  If no, what is the reason: _____

- AA/NA post- discharge ☐Yes ☐No
  If no, what is the reason: _____

■ At 30 days after discharge

a. Did you start using drugs/ drinking alcohol within a month after you get discharged from Crossroads?
if yes, education, necessary resources, and hotline numbers provided? ☐ Completed

b. Health leads (After 30 days of discharge)
if new needs identified, provided resources and referred to SHOW ☐ Completed

Appendix N

Instrument 3

Pre- Intervention Health Leads Survey & *Post- Intervention Health Leads Survey*

Note: Removed due to Copyright

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Appendix O

Instrument 4

Assessment of Warning Signs of Relapse Questionnaire

Please read the following statements and for each one circle a number, from 1 to 7, to indicate *how much this has been true for you recently.* Please circle one and only one number for every statement.

Date of last alcoholic drink/ drug use: _____

	Never	Rarely	Sometimes	Fairly Often	Often	Almost Always	Always
1. I feel nervous or unsure of my ability to stay sober.	1	2	3	4	5	6	7
2. I have many problems in my life.	1	2	3	4	5	6	7
3. I tend to overreact or act impulsively.	1	2	3	4	5	6	7
4. I keep to myself and feel lonely.	1	2	3	4	5	6	7
5. I get too focused on one area of my life.	1	2	3	4	5	6	7
6. I feel blue, down, listless, or depressed.	1	2	3	4	5	6	7
7. I engage in wishful thinking.	1	2	3	4	5	6	7
8. The plans that I make succeed.	1	2	3	4	5	6	7
9. I have trouble concentrating and prefer to dream about how things could be.	1	2	3	4	5	6	7
10. Things don’t work out well for me.	1	2	3	4	5	6	7
11. I feel confused.	1	2	3	4	5	6	7
12. I get irritated or annoyed with my friends.	1	2	3	4	5	6	7
13. I feel angry or frustrated.	1	2	3	4	5	6	7
14. I have good eating habits.	1	2	3	4	5	6	7
15. I feel trapped and stuck, like there is no way out.	1	2	3	4	5	6	7
16. I have trouble sleeping.	1	2	3	4	5	6	7

17. I have long periods of serious depression.	1	2	3	4	5	6	7
18. I don’t really care what happens.	1	2	3	4	5	6	7
19. I feel like things are so bad that I might as well drink/use drugs.	1	2	3	4	5	6	7
20. I am able to think clearly.	1	2	3	4	5	6	7
21. I feel sorry for myself.	1	2	3	4	5	6	7
22. I think about drinking/drug use.	1	2	3	4	5	6	7
23. I lie to other people.	1	2	3	4	5	6	7
24. I feel hopeful and confident.	1	2	3	4	5	6	7
25. I feel angry at the world in general.	1	2	3	4	5	6	7
26. I am doing things to stay sober.	1	2	3	4	5	6	7
27. I am afraid that I am losing my mind.	1	2	3	4	5	6	7
28. I am drinking/using drugs out of control.	1	2	3	4	5	6	7

Appendix P

Figure 1

Project Recruitment Flyer

Appendix P

Document 2

Informed Consent

Improving the Care Transition to Outpatient Aftercare Services Following Addiction Treatment

I am a family nurse practitioner student at Arizona State University (ASU). I am being guided by Dr. Carol Moffett, PhD, FNP- BC, who is faculty in the ASU College of Nursing and Health Innovations and who is the primary investigator for this study. We are inviting you to participate in this study because you are receiving treatment at Crossroads. This study is designed to help you connect with services after you leave Crossroads. We want to see if connecting with these services can help prevent relapse. The study will take place while you are at Crossroads and for 30 days after you leave the center. If you agree to participate in this study, you can expect the following:

- You will be asked to fill out four forms throughout the study. The time it takes to complete the forms may vary depending on your participation.
    a. **Demographic Questionnaire**—basic information about you: 5 minutes at the start of the study.
    b. **AWARE (Advance Warning of Relapse) questionnaire** filled out twice once at the beginning and again before leaving Crossroads: 5-10 minutes
    c. **Health Leads Survey**—questions about basic needs filled out twice once at the beginning and again 30 days after discharge: 5 minutes
    d. **Post-intervention data collection form**—questions about services, appointments, and relapse status filled out twice once just before leaving Crossroads and again 30 days after discharge: 5 minutes
- While in the study, we will ask for information about:
    a. What services you needed and used while at Crossroads. This information will also be taken from a form at Crossroads.
    b. What services you used in the 30 days after discharge.
    c. What problems you had finding and using services.

- We will ask you to attend weekly 15- minute sessions during your stay at Crossroads. If you decided to extend your treatment beyond 30 days, sessions will be as needed basis until you leave the program.

- After you leave Crossroads, message reminders will be sent within a week before your appointments

- Follow- up messages will be sent:
    a) the day after your scheduled appointments with your doctor,
    b) the day after your first 12-step meeting,
    c) the day after your first sponsor meeting to ask about your attendance,
    d) 30 days after you leave the program to ask about any relapse and any services used.

- It is very important to collect complete information. For this reason, you will be asked to provide at least two trusted contact persons. They will be called by the researcher to ask about your attendance with appointments and relapse status only if you cannot be reached.

Depending on whether you have a smart phone, the information will be gathered either through iTether (a secure mobile application) or through surveys completed in-person, calls, text, and/or email messages. Your responses on the questionnaires will be confidential and will be stored in a locked box or in iTether only accessed by the research team. You will be identified using a 32-number combination for study reporting. The results of this study may be used in reports, presentations, or publications, but nothing identifying you will be used. Information you give in the study may be kept for future research.

To be eligible for this study, you must be 18 years of age or older and must be able to speak and understand English. There is no known risk greater than those that are associated with everyday types of activity. Possible benefits include: a) improved access to needed medical and community support services, b) improved health and well-being because of increased access and engagement to needed services, and c) decreased risk of relapse.

You are free to decide whether you want to participate in this study. Your choice to participate or not participate will not affect the care you receive in the center. You can leave the research at any time and it will not be held against you. Participation in this study will not affect your parole status. You will not be paid to participate in this study. Instead of being in this research study, you can choose to continue the regular care transition processes in the facility, which does not include those discussed above.

If you have any questions concerning this program, please contact either Dr. Carol Moffett, PhD, FNP-BC, CDE, FAANP at Carol.Moffett@asu.edu or Roxanne Tenorio, BSN, RN, DNP student at rrtenori@asu.edu. If you have any questions about your rights as a participant in this project, or you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788 or by email at research.intergrity@asu.edu.

Thank you,
Roxanne Tenorio, RN, BSN, DNP-FNP Student

I certify that I am at least 18 years of age ◯Yes ◯No

I certify that I read and understood the information presented in the above consent letter. My questions and concerns (if any) about this research study have been addressed ◯Yes ◯No

I voluntarily consent to participation in this study (An answer of “Yes” will constitute your full agreement to participate in this study ◯Yes ◯No

_____ _____

Signature of participant Date

_____

Printed name of participant

Appendix R

Document 3

Outline of Educational Sessions

OUTLINE OF EDUCATIONAL SESSIONS

Topic: Overcoming Addiction

I. Utilize educational plan and tools while incorporating motivational interviewing with emphasis on the following: a) intrinsic motivation, b) importance of access and follow-up adherence to medical services, c) creating healthy social connections and activities (Sponsorship and AA/NA meetings), and d) relapse prevention. Educational sessions with motivational interviewing will be on a weekly basis for at least 15 minutes per session.

A. Emphasis on intrinsic motivation

1. Activity:
   - Goal discussion and problem- solving: Allow participant to prioritize needs and identify possible solutions to get access with these needs and obtain abstinence goals. Give support by providing necessary resources and tools

B. Importance of engagement with medical services

1. Individualized education regarding substance use disorder and effect to health
2. Importance of healthcare engagement and substance use outcomes
3. Importance of being open to healthcare providers
4. Activity:
   - Schedule outpatient appointments (give support if needed)
     **Utilize and discuss appointment schedule form/iTether calendar

C. Importance of creating healthy social connections and relapse prevention

1. Understanding addiction
2. Importance of repairing “old” support systems and creating “new” healthy relationships
   **Utilize resource book for community support
3. Importance of attending AA/NA meetings and connecting with a sponsor
4. Activity:
   - Schedule meeting with Sponsor weekly and after discharge (give support if needed)
     **Utilize and discuss appointment schedule form/iTether calendar
   - Schedule AA/NA meetings post- discharge
     **Utilize and discuss appointment schedule form/iTether calendar
   - Complete relapse prevention card
     > sponsor contact information
     > trusted person to call
     > list of enjoyable drug-free activities to do
     > hot line numbers to call

Appendix S

Table 4

Demographic Characteristics

	$\bar{x}$	SD (Range)	n	%
Age	35.37	10.47 (20-59)		
Gender				
Male			16	53.3
Female			14	46.7
Race				
Caucasian			13	43.3
Hispanic			9	30.0
African American			5	16.7
Native American			2	6.7
Asian			1	3.3
Educational Level				
Grade School Diploma			6	20.0
High School or Equivalent			14	46.7
Certificate/Training Program			4	13.3
Associate's Degree			1	3.3
Bachelor's Degree			4	13.3
Doctoral Degree			1	3.3
Marital Status				
Single			15	50.0
Married			9	30.0
Divorced			5	16.7
Separated			1	3.3
Reason for Admission				
Mandated/Pre-trial			10	33.3
Voluntary			19	63.3
Other			1	3.3
Primary Substance of Choice				
Alcohol			8	26.7
Cocaine			2	6.7
Heroin			6	20.0
Methamphetamines			10	33.3
Opioids			4	13.3
Secondary Substance of Choice				
Opioids			1	3.3
Benzodiazepines			2	6.7
Cocaine			2	6.7
Heroin			3	10.0
Methamphetamines			8	26.7
Marijuana			7	23.3

	$\bar{x}$	SD (Range)	n	%
Other			4	13.3
Presence of Medical Condition			13	43.3
Medical Conditions				
Hypertension			3	10.0
Heart Failure			2	6.7
Asthma			3	10.0
Diabetes			1	3.3
Thyroid Disease			1	3.3
Chronic Back Problem			2	6.7
Arthritis			4	13.3
Hepatitis			1	3.3
Sexually Transmitted Illness			2	6.7
Endocarditis			1	3.3
Hernia			1	3.3
Paresthesia			1	3.3
Presence of Psychiatric Condition			11	36.7
Psychiatric Conditions				
Depression			7	23.3
Anxiety			7	23.3
Attention Deficit Disorder			1	3.3
Post-traumatic Stress Disorder			2	6.7
Eating Disorder			1	3.3
Paranoid Schizophrenia			1	3.3
Other Mood Disorder			1	3.3
Prior Addiction Treatment			16	53.3
History of Imprisonment			25	83.3
History of Homelessness			19	63.3
Insurance Provider				
Medicaid			24	80.0
Private Insurance			2	6.7
Other			1	3.3
No Insurance			3	10.0
Total Length of Stay				
30 days			6	20.0
60 days			9	30.0
90 days			2	6.7
Other			9	30.0
Did not complete treatment			4	13.3
Discharge Disposition				
Sober living			3	10.0
Home			8	26.7
Halfway house			1	3.3
Quarter house			2	6.7
Lost to follow-up/ Relapsed			16	53.3

Note. n= number of participants; $\bar{x}$= mean; SD= standard deviation.

Appendix T

Table 5

Comparison of Pre- and Post- Intervention Community Aftercare Needs

Needs	Pre-intervention	Post-intervention	McNemar Test
Smart phone needs	12	2	**.002***
Food insecurity	11	4	**.016***
Housing instability	23	12	**.001***
Utility needs	9	3	**.031***
Financial resource strain	10	3	**.016***
Transportation needs	16	4	**<.001***
Exposure to violence	0	0	Not applicable
Child care needs	4	2	.5
Literacy needs	4	2	.5
Unemployment	26	5	**<.001***
No insurance	5	3	.5
Behavioral/Mental needs	12	4	**.021***
Social isolation	6	1	.063
Dental care needs	15	14	1
Eye care needs	14	9	.063
Legal service needs	4	3	1
Spiritual needs	4	1	.25
Needs PCP	22	16	**.031***
Needs psychiatric provider	1	1	1
Sponsor needs	13	3	**.002***
Support group needs	8	6	.5

Note. n=30, significant result (*p=<.05)* are in bold with asterisk. PCP= Primary Care Physician.

Appendix U

Figure 2

Comparison Between Pre- and Post- Intervention Relapse Risk Percentages

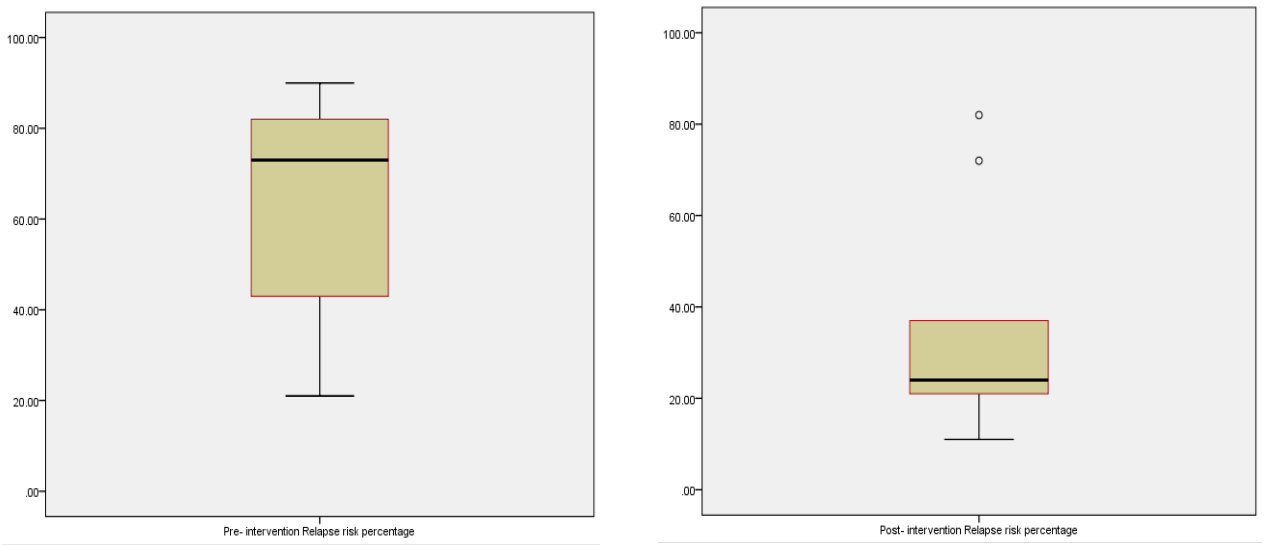

Figure 2. A Wilcoxon test examined the change in relapse percentage risk pre- and post-intervention (n=14). A significant difference was found in the results (Z= -3.180, *p= .001),* indicating reduction in relapse risk post- intervention.

Appendix V

Figure 3

Flowchart of Participant Enrollment and Retention

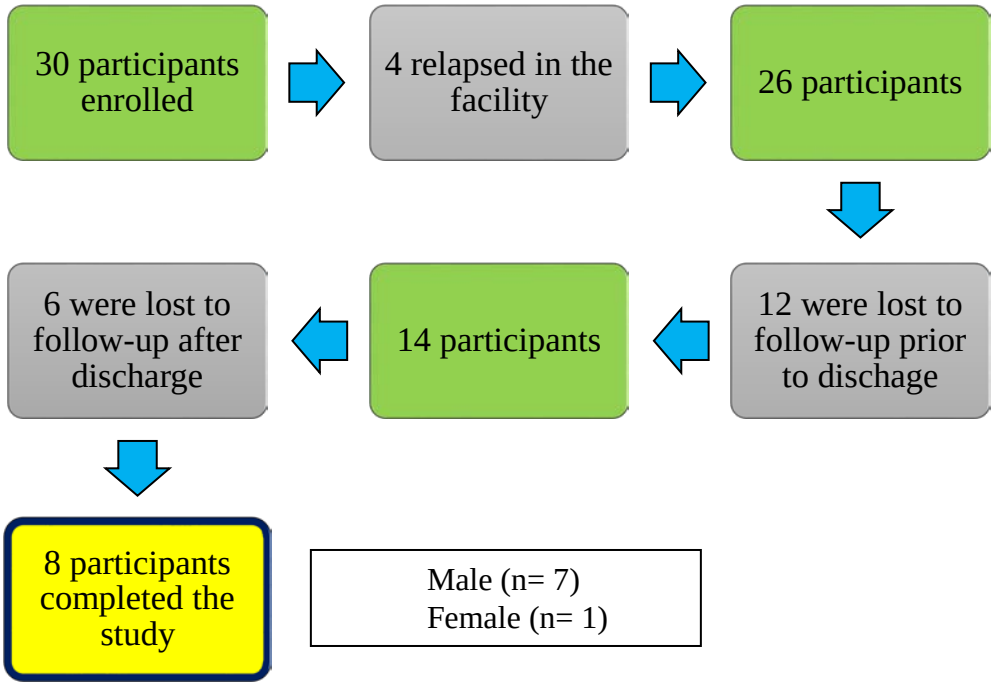

Figure 3. n= number of participants.

Appendix W

Table 6

Follow-up Adherence and Engagement to Appointments Scheduled After Discharge

	n	FA	CE
PCP	10	9	8
Sponsor	14	12	12
Support group	13	12	12

Note. n= number of participants with scheduled appointments; PCP=Primary Care Physician; FA= Follow-up adherence; CE= Continued engagement.

Appendix X

Table 7

Relapse Status at 30 days After Discharge

	n	*%*
Did not relapse	8	27
Relapse in the facility	4	13
Lost to follow-up	18	60

Note. n= number of participants.