ISSN: 3065-4874
ResearchArticle
Journal of Psychiatry and Neurochemistry Research

Rehabilitation for Adults with Co-Morbid Substance Use and Mental Health Disorders: A Scoping Review of Programmatic Outcomes and Evidence Gaps

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Submitted: 24 October 2025 **Accepted:** 04 November 2025 **Published:** 10 November 2025

https://doi.org/10.63620/MKJPNR.2025.1075

Citation: *Karikari, M., Adeleke, V., & Okafor, A. J. (2025). Rehabilitation for Adults with Co-Morbid Substance Use and Mental Health Disorders: A Scoping Review of Programmatic Outcomes and Evidence Gaps. J of Psych and Neuroche Res, 3(6), 01-16.*

Abstract

Background: *Adults with co-morbid substance use and mental health disorders represent a complex population requiring specialized rehabilitation approaches. The outcomes of different treatment models for this population requires careful evaluation.*

Aim: *To identify and critically appraise key program components, implementation barriers, and knowledge gaps in current rehabilitation interventions, informing future research, service delivery, and policy development for dual-diagnosis populations.*

Methods: *A comprehensive review of evidence was conducted, analysing ten studies comprising seven systematic reviews, one randomized controlled trial, one observational study, and one quasi-experimental study. All studies evaluated integrated care models that combined mental health treatment with substance use interventions.*

Results: *Integrated care models showed positive outcomes in several areas. Eight studies reported mental health improvements, such as better psychological functioning, less severe PTSD, and fewer psychiatric hospitalizations. Substance use also declined in eight studies, though results varied. Comparative analyses indicated integrated care was more impactful and effective than non-integrated or parallel models in reducing hospitalizations, arrests, and crisis service use.*

Conclusion: *Successful program implementation involves components such as on-site mental health care, staff training, intensive case management, motivational strategies, individualized plans, and co-located services. Future research should evaluate the independent impact and cost-effectiveness of these elements, and inform sustainable, evidence-based policies for long-term rehabilitation success. A comprehensive and innovative approach is essential to improve outcomes for this complex patient group.*

Keywords: Integrated Care Programs, Comorbidity, Substance Use Disorders, Rehabilitation, Psychiatric Disorders, Treatment Outcomes.

Highlights

1. **Integrated Care Superiority:** Integrated rehabilitation programs consistently outperformed non-integrated models in improving mental health, reducing substance use, and enhancing psychosocial outcomes across most studies.
2. **Key Program Components:** Core elements such as co-located services, on-site mental health care, intensive case management, and motivational interventions were linked to impactful treatment outcomes.
3. **Methodological Weaknesses:** The evidence base is limited by few high-quality trials, short follow-up periods, and inconsistent outcome measures, reducing the strength and

applicability of findings.

4. Implementation and Equity Barriers: Persistent challenges include low engagement, treatment non-completion, and access disparities, particularly affecting marginalized populations.
5. Lack of Economic and Long-Term Data: There is a critical gap in cost-effectiveness analyses and long-term outcome evaluations, limiting the scalability and policy uptake of integrated models.

Introduction

The co-occurrence (co-morbid disorders or dual diagnosis) of substance use disorders and mental health conditions presents a significant challenge in rehabilitation management, requiring specialized and comprehensive treatment approaches. This complex comorbid disorder often results in poorer clinical outcomes, increased service utilization, and substantial barriers to effective treatment [1, 2]. Conventional treatment models, where mental health and substance use disorders are addressed separately, have shown limited impact and effectiveness in managing these interrelated conditions [3]. Recent developments in rehabilitation programming have led to the emergence of integrated care models that combine mental health and substance use interventions within a unified treatment framework [4]. These integrated approaches incorporate various components, including on-site mental health services, specialized staff training, intensive case management, and coordinated care delivery [5]. While preliminary evidence suggests the potential benefits of integrated treatment models, significant variations exist in program implementation, their impact and effectiveness [6]. The complexity of treating co-morbid disorders is further compounded by challenges in treatment engagement, completion rates, and access disparities among different populations [7, 8]. Additionally, it is reported that the evidence base is limited by methodological weaknesses, including a lack of rigorous randomized controlled trials and inconsistent outcome measures [9]. Therefore, it has become imperative for the comprehensive evaluation of rehabilitation programs given the high stakes for this vulnerable population and the resource-intensive nature of integrated treatment approaches [10].

This scoping review aims to examine the impact of rehabilitation programs for adults with comorbid substance use and mental health disorders, with particular attention to programs' long-term impact, implementation challenges, and opportunities for improvement. By synthesizing evidence from diverse study designs and treatment approaches, this review seeks to identify successful program components and address critical gaps in current understanding of comorbid treatment. The findings will contribute to the growing body of knowledge regarding rehabilitation strategies that are sustainable with long-term impact for this complex patient population and inform future program development, practice and research directions.

Methods

The methodological approach for this scoping review was guided by Arksey and O'Malley's established framework, which encompasses a systematic five-stage process namely, identification of the research question, comprehensive literature retrieval, systematic literature selection, structured data extraction, and rigorous synthesis and presentation of findings [11]. While this methodological framework provided a robust structure for the review process, it should be noted that no formal review protocol was registered or published prior to conducting this study, which represents a methodological limitation in terms of pre-specified review parameters. To ensure methodological rigor and reporting transparency, this scoping review was conducted and documented in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines. This standardized reporting framework was systematically implemented to enhance the methodological quality and reproducibility of the review process, while facilitating comprehensive documentation of the study's methodological approach and findings.

Formulating a Research Question

The main research question of this scoping review was to evaluate the impact of rehabilitation programs for adults with comorbid substance use and mental health disorders. The review focused on integrated care models that address mental health treatment alongside substance use interventions. Program outcomes were assessed in areas such as mental health, substance use, and implementation factors, with attention to identifying various key components and barriers associated with treatment delivery.

Literature Search

A comprehensive literature search was conducted across multiple electronic databases, including PubMed, PsycINFO, and CINHAL, to identify studies pertinent to the aims of this review. The inclusion criteria were guided by the PICOT framework (Population, Intervention, Comparison, Outcome, and Time), focusing on adults with co-occurring substance use and mental health disorders who have participated in rehabilitation programs or treatments. No temporal restrictions were imposed on the search. The selection process involved screening titles and abstracts, followed by a full-text review. The initial search identified 174 potential publications (PubMed = 88; PsycINFO = 52; CINHAL = 34). After relevance screening, 26 studies remained, from which 16 duplicates were eliminated. In total, 164 articles were excluded, resulting in the retention of 10 publications for this review. Figure 1 provides a visual summary of the study selection process. The following search terms were employed to define the search strategy and facilitate the identification of relevant studies:

Population Terms: ("dual diagnosis" OR "co-occurring disorder*" OR "comorbid*" OR "concurrent disorder*" OR "dual disorder*" OR "mentally ill chemical abuse*" OR "psychiatric comorbidity") AND ("substance use disorder*" OR "substance abuse" OR "drug abuse" OR "drug dependence" OR "alcohol abuse" OR "alcohol dependence" OR "addiction" OR "SUD" OR "chemical dependency") AND ("mental health disorder*" OR "mental illness" OR "psychiatric disorder*" OR "psychological disorder*" OR "depression" OR "anxiety" OR "PTSD" OR "post-traumatic stress disorder" OR "mood disorder*" OR "psychosis" OR "schizophrenia").

Intervention Terms: ("psychosocial treatment" OR "rehabilitation" OR "residential program*" OR "community care" OR "inpatient treatment" OR "integrated treatment*") AND ("trau-

ma-informed treatment" OR "integrated care" OR "comprehensive treatment" OR "holistic treatment" OR "combined treatment" OR "concurrent treatment").

Study Design Terms: ("Randomized controlled trial" OR "controlled clinical trial" OR "clinical trial" OR "comparative study" OR "evaluation study" OR "observational study" OR "cohort study" OR "prospective study" OR "retrospective study" OR "longitudinal study "OR "Quasi-experimental study").

The search was restricted to peer-reviewed journals published in English and focused on studies involving adults aged 18 years and older. The search strategy was formulated in collaboration with a research librarian and piloted initially to confirm both its sensitivity and specificity in identifying pertinent literature.

Inclusion and Exclusion Criteria

The review included seven systematic reviews (with meta-analyses), one randomized controlled trial, one observational study, and one quasi-experimental study. Studies were selected for broad coverage of treatments and populations, without restriction by location or setting. Inclusion criteria were as follows:

Population

The population consisted of adults (aged 18 and above) who had a primary diagnosis of substance use disorder (SUD) along with co-occurring mental health disorders, including but not limited to mood disorders, anxiety disorders, post-traumatic stress disorder (PTSD), and psychotic disorders.

Intervention: Interventions were prioritised based on their focus on rehabilitation programmes and integrated treatment approaches that address both substance use disorders (SUD) and mental health conditions, with an emphasis on programmes offering a minimum treatment duration of 28 days. Further inclusion criteria encompassed programmes incorporating individual and/or group therapy, psychiatric evaluation and medication management, as well as evidence-based psychosocial interventions.

Data Extraction

Three independent reviewers extracted data from each study, resolving any discrepancies through discussion. The extraction process utilised Covidence to ensure rigorous documentation and systematic data management. Data were compiled into standardized tables to facilitate cross-study comparisons. Qualitative information on program components and implementation was thematically synthesized. The resulting data served as the foundation for the narrative synthesis.

Statistical Analyses

We summarised statistical results and study effects through a narrative synthesis of the findings.

Outcome Measures

The studies reviewed utilized a range of standardized outcome measures encompassing three primary domains namely, psychiatric symptomatology, substance use behaviours, and psychosocial functioning. For the assessment of psychiatric symptomatology, psychological functioning was measured using validated instruments such as the Brief Symptom Inventory and the RAND 36-Item Short Form Survey [8]. Additional psychiatric indicators included the frequency of psychiatric hospitalizations and standardized measures of post-traumatic stress disorder severity [3, 9]. Regarding substance use outcomes, assessments addressed both specific substance indicators such as heroin use frequency and broader patterns of substance use [8]. Multiple studies implemented thorough protocols to assess both alcohol and illicit drug use simultaneously [4, 9]. Additionally, these investigations incorporated metrics such as indicators of substance-related harm and engagement with crisis intervention services [3, 5]. The assessment of psychosocial functioning included several areas such as legal system involvement, measured by arrest rates, vocational functioning, assessed through employment metrics, quality of life indices, and healthcare utilization patterns [3, 5, 10]. Secondary outcomes encompassed treatment adherence and completion rates, adverse event monitoring, cost-effectiveness analyses, and comparisons between integrated and non-integrated treatment approaches [1, 2, 4]. Outcome evaluation timeframes differed across studies, covering immediate post-intervention assessments, follow-ups at 6 months, and extended periods up to 12 months [7, 8, 3]. This longitudinal approach allowed for the assessment of both short-term and long-term effects. Studies without outcome data, those not published in English, or those lacking follow-up assessments were excluded.

Results

A total of 174 records were initially identified for this review. Covidence was used to remove 16 duplicate entries. Subsequently, 59 full-text articles were retrieved, and 26 were evaluated for eligibility. Overall, 164 records were excluded from further analysis. Ultimately, 10 studies met the inclusion criteria and were examined in this review. The PRISMA flow diagram (Figure 1) provides an overview of the screening and selection process that resulted in the final set of 10 included studies. These studies comprised systematic reviews that accounted for the majority (n = 7; 70%, including meta-analyses), while the remaining studies included one randomized controlled trial, one observational study, and one quasi-experimental investigation [1, 2, 5, 6, 9, 10].

All studies examined integrated care interventions, with three (n=3; 30%) specifically conducting comparative analyses between integrated and non-integrated or parallel treatment approaches [2, 3, 6]. Sample sizes varied considerably across the primary studies. The randomized controlled trial included 54 patients, while the observational study examined 351 adults and the quasi-experimental study analysed 216 individuals [3, 7, 8]. The largest systematic review incorporated 1,506 participants [9]. The included studies focused on adults with co-occurring disorders, including, Schizophrenia or major affective disorders with concurrent substance use disorders, post-traumatic stress disorder with substance use disorders as well as severe and persistent mental illness with substance use disorders [3, 7, 9]. Various combinations of Axis I disorder, and substance use disorders were also reported [4].

Several methodological constraints were noted across studies. These include engagement and completion challenges, low quality evidence in some systematic reviews as well as high risk of bias in implementation studies [5, 7, 9]. Additionally, limited

randomized controlled trials and the exclusion of severe or complex cases in some studies (Tiet and Mausbach, 2007; Roberts et al., 2016) were also noted as a methodological constraint [6, 9]. Demographic reporting was inconsistent across studies, with limited age and gender breakdowns provided in the available documentation. One study specifically included analysis of African American subgroups, though comprehensive demographic data was generally lacking across the included studies [8].data was generally lacking across the included studies.

Table 1: Characteristics of Included Studies

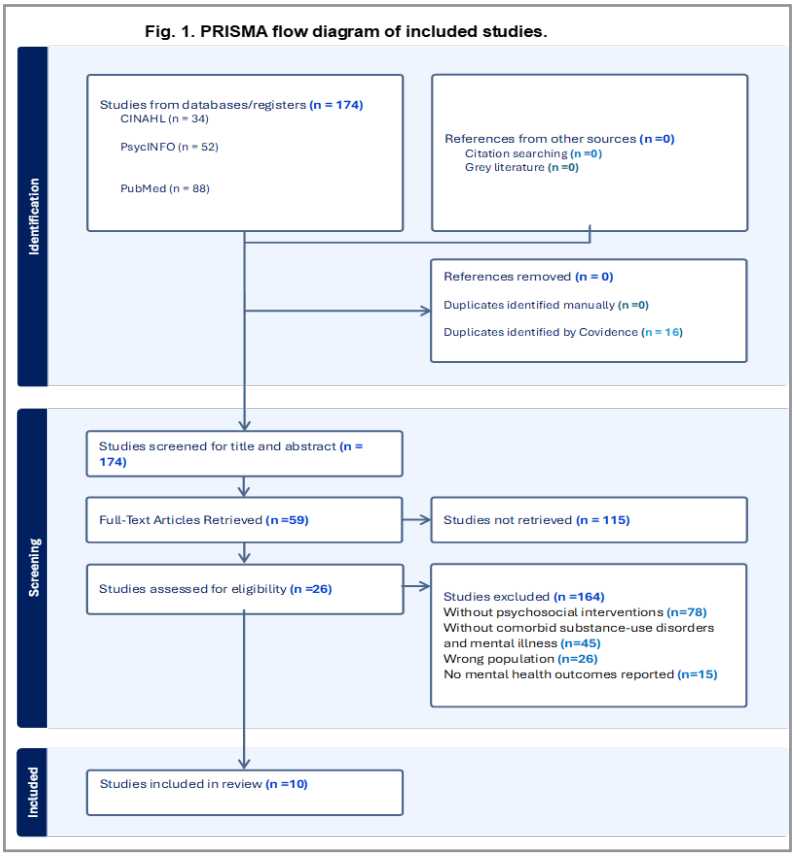
Author/ Year Country	Study Design	Program Type (Integrated/ Non-integrated)	Population Characteristics	Primary Outcomes	Key Findings	Study Objective/ Aim
Lehman et al., (1993) USA, Maryland, Baltimore	Randomized Controlled Trial.	Integrated (innovative group plus intensive case management added to usual care).	54 adult patients (18 to 40 years) with either schizophrenia or major affective disorder and a substance use disorder were randomly assigned to usual community mental health centre and rehabilitation services with or without an innovative group (focused on problems of dually diagnosed young adults) and intensive case-management (ICM) program.	Patient outcomes at 1 year (not specified.	Patient outcomes at 1 year (not specified.	To evaluate the effectiveness of an integrated program consisting of an innovative group plus intensive case management added to usual care.
Grella and Stein, (2006) USA, Los Angeles	Observational study.	Integrated (varying levels of on-site mental health services in residential substance use disorder programs)	351 adults with co-occurring disorders; no age/gender breakdown; African American subgroup analysis.	Psychological functioning (Brief Symptom Inventory, RAND 36-Item Short Form Survey), heroin uses at 6 months	Individuals treated in programs that provided specific dual diagnosis services subsequently had higher rates of utilizing mental health services over six months and, in turn, showed significantly greater improvements in psychological functioning (as measured by the Brief Symptom Inventory and the RAND Health Survey 36-item short form) at follow-up.	Examined the outcomes of individuals with co-morbid disorders who received drug treatment in programs that varied in their integration of mental health services.

Mangrum et al., (2006) Texas, USA	Quasi-experimental study	Integrated versus parallel treatment	216 individuals; co-occurring severe and persistent mental illness and substance use disorder; no further details	Psychiatric hospitalization, arrest at 1 year	Comparisons indicated that the integrated group achieved greater reductions in the incidence of psychiatric hospitalization and arrest.	Compared 1-year treatment outcomes of 216 individuals with co-occurring severe and persistent mental illness and substance use disorders who were assigned to an integrated or parallel treatment condition.
Roberts et al., (2016) United Kingdom (UK)	Systematic review, meta-analysis	Integrated (psychological therapies for post-traumatic stress disorder plus substance use disorder, trauma-focused and non-trauma-focused).	1506 participants (adults); post-traumatic stress disorder plus substance use disorder; excluded severe/complex cases.	Post-traumatic stress disorder severity, drug/alcohol use, therapy completion, adverse events	Individual-based psychological therapies with a trauma-focused component plus adjunctive SUD intervention were more effective than treatment as usual (TAU)/minimal intervention for PTSD severity post-treatment (standardised mean difference (SMD) -0.41; 95% confidence interval (CI) -0.72 to -0.10. 4 studies; n = 405; very low-quality evidence) and at 3 to 4 and 5 to 7 months' follow-up.	To assess the comparative effectiveness of psychological therapeutic interventions in the treatment of concurrent post-traumatic stress disorder (PTSD) and substance use disorder (SUD), examining both trauma-focused and substance use-oriented outcomes against standard care protocols and alternative psychotherapeutic approaches.
Drake et al., (2004), USA	Systematic review	Integrated (psychosocial interventions, outpatient and residential)	26 controlled studies of psychosocial interventions for severe mental illness plus substance use disorder	Effectiveness of integrated versus non-integrated interventions	Individualized treatment helps to address personal factors and stage of motivation, e.g., engaging people in services, helping them to develop motivation, and helping them to develop skills and supports for recovery.	To assess the effectiveness of integrating outpatient mental health and substance use treatments as well as the impact of individualized and long-term residential treatments for comorbid population.
Karapareddy (2019) Vancouver, Canada.	Systematic review, meta-analysis.	Integrated care models versus standard care	Concurrent disorders (mental health plus substance use disorder)	Clinical and social outcomes, cost-effectiveness	Integrated models demonstrated improvement in mental health and a reduction in substance use disorders. Integrated models are also more cost-effective than standard care.	To determine whether existing service models are effective in treating combined mental health and substance use disorders and to examine whether an integrated model of service delivery should be recommended to policy makers.

Kelly et al., (2012) USA	Systematic review	Integrated (combination of pharmacological and psychotherapeutic interventions.	Comorbid substance use disorder and Axis I disorders (schizophrenia, post-traumatic stress disorder, etc.)	Effectiveness of combined treatments for comorbidity.	Second-generation antipsychotics (e.g., clozapine, olanzapine, risperidone) are effective for schizophrenia and comorbid substance abuse. Motivational interviewing is effective for establishing a therapeutic alliance. Clozapine is most effective for reducing alcohol, cocaine, and cannabis use in schizophrenia patients. Contingency Management is effective against cannabis use and mood disorders while contingency management is effective against cannabis use and mood disorders.	To update clinicians on the latest in evidence-based treatments for substance use disorders (SUD) and non-substance use disorders among adults and suggest how these treatments can be combined into an evidence-based process that enhances treatment effectiveness in comorbid patients
Tiet and Mausbach, (2007) California, USA	Systematic review	Integrated (co-located outpatient mental health and alcohol and other drug specialist treatment).	59 studies focused on interventions for adults with comorbid substance use and mental health disorders.	Specific mental health outcomes measures and specific substance use outcomes measures	No treatment was identified as efficacious for both psychiatric disorders and substance-related disorder. However, this review finds that existing efficacious treatments for reducing psychiatric symptoms also tend to work in dual-diagnosis patients. Secondly, existing efficacious treatments for reducing substance use also decrease substance use in dually diagnosed patients.	To evaluating the efficacy of both psychosocial and medication treatments for patients with dual diagnosis (various combinations of psychiatric and substance use disorders). Specific objectives included: According to the research report, Tiet and Mausbach, 2007 conducted a systematic review with the primary objective of evaluating the efficacy of both psychosocial and medication treatments for patients with dual diagnosis (various combinations of psychiatric and substance use disorders). Specifically, the review aimed to: 1. Assess the effectiveness of existing treatments for psychiatric symptoms in dual-diagnosis patients. 2. Evaluate the efficacy of treatments for substance use outcomes in dually diagnosed patients. 3. Examine whether treatments were consistently effective across both psychiatric and substance use domains.

Glover-Wright et al., (2023) Australia	Systematic review.	Integrated (co-located outpatient mental health and alcohol and other drug specialist treatment.	Adults with dual diagnosis of substance use disorder and mental illness	Substance use, mental health symptoms, quality of life, service use.	Provisional evidence that integrated care that includes co-located mental health care and AOD specialist treatment was associated with reductions in substance use and related harms and mental health symptom severity, improved quality of life, decreased emergency department presentations/ hospital admissions and reduced health system expenditure.	To evaluate the health outcomes and service use patterns associated with co-located outpatient mental health care and alcohol and other drug specialist treatment for adults with dual diagnosis.
Harrison et al., (2019) Michigan, USA.	Systematic review	Integrated (Individual Placement and Support employment intervention).	Adults with substance use disorder or substance use disorder plus mental health disorder.	Efficacy of Individual Placement and Support for substance use disorder/ comorbid populations.	There was high evidence to support to application of IPS for persons with SUD, both singly and when combined with a mental health disorder.	To evaluate and organize the evidence base of using Integrated Individual Placement and Support (IPS) with adults with concurrent substance use mental disorders.

Fig. 1. PRISMA flow diagram of included studies.



Primary Outcomes

The evidence from this scoping review indicates that integrated treatment approaches generally demonstrated positive outcomes across both mental health and substance use domains, despite varying levels of impact and effectiveness. Systematic reviews and meta-analyses revealed that integrated care models improved mental health outcomes and reduced substance use disorders while trauma-focused psychological therapies showed small but significant effects on post-traumatic stress disorder severity and long-term substance use outcomes, albeit with low-quality evidence [1, 2, 9]. Similarly, combined pharmacological and psychotherapeutic interventions proved impactful and effective for

both psychiatric symptoms and substance use in dual-diagnosis patients [4, 9]. whereas co-located outpatient care demonstrated provisional evidence for reducing both mental health symptom severity and substance-related harms [3]. Individual studies provided additional support, with integrated treatment showing superior outcomes compared to parallel treatment in reducing psychiatric hospitalizations [5]. Interestingly, programs with integrated mental health services demonstrated significant improvements in psychological functioning and reduced heroin use [8]. However, some limitations were noted, including one early trial that found no significant advantages for integrated care, while employment-focused interventions showed promising results for both substance use and mental health outcomes [7, 10]. The overall evidence suggests that while integrated approaches generally show promise, the quality of evidence varies considerably across studies, and implementation challenges remain significant barriers to success.

Effect: Mental Health Outcomes

Systematic reviews and meta-analyses included in this study provided substantial evidence supporting the impact and effectiveness of integrated treatment approaches for mental health outcomes in comorbid populations. Multiple systematic reviews demonstrated that integrated care models yielded improvements in mental health symptoms [1, 2]. Specifically, trauma-focused psychological therapy showed positive effects on post-traumatic stress disorder severity both post-treatment and at follow-up, though effect sizes were small and evidence quality was rated as low [9]. Reviews of combined pharmacological and psychotherapeutic interventions found that second-generation antipsychotics and motivational interviewing were particularly effective and impactful for mental health symptoms in comorbid populations, while existing efficacious treatments for psychiatric symptoms maintained their effectiveness in comorbid patients [4, 6].

Individual studies provided more specific evidence regarding specific intervention approaches and their impact on mental health outcomes. Programs incorporating integrated mental health services demonstrated significant improvements in psychological functioning, as measured by standardized instruments including the Brief Symptom Inventory and RAND 36-Item Short Form Survey [8]. Notably, integrated treatment showed superior outcomes compared to parallel treatment approaches in reducing psychiatric hospitalization [3]. In furtherance, co-located outpatient mental health and substance use treatment services showed provisional evidence for reductions in mental health symptom severity, though these findings were accompanied by a high risk of bias [5]. However, not all studies showed positive results, with one early trial finding no significant improvement in mental health outcomes with the addition of an innovative program, citing engagement as a major barrier [7]. Critical analyses of these findings suggest a generally positive but nuanced picture of integrated treatment impact and effectiveness for mental health outcomes in comorbid populations. The preponderance of evidence from both systematic reviews and individual studies supports the superiority of integrated approaches over non-integrated or parallel treatment models. However, several important caveats must be considered. Foremost, the quality of evidence was frequently rated as low, with multiple studies noting high risk of bias or methodological weaknesses [5, 9]. Secondly, treatment engagement and completion emerged as significant challenges, whereas the specific mechanisms driving positive outcomes in integrated programs were often difficult to isolate [7]. While the overall direction of evidence supports integrated treatment approaches, the varying quality of evidence and presence of implementation barriers suggests the need for more rigorous research to establish optimal program components and delivery methods.

Effect: Substance-Use Outcomes

Systematic reviews and meta-analyses included in this analysis provided substantial evidence regarding the impact of integrated treatments on substance use outcomes in dual diagnosis (comorbid) populations. Integrated care models demonstrated consistent reductions in substance use disorders while integrated outpatient and residential treatments showed effectiveness for substance use outcomes [1, 2]. Detailed analysis of pharmacological interventions revealed that clozapine was particularly effective for reducing alcohol, cocaine, and cannabis use in schizophrenia patients, while contingency management showed promise for cannabis use and mood disorders. Moreover, trauma-focused interventions showed no immediate effect on substance use post-treatment, but demonstrated small effects at long-term follow-up, with group therapy (Seeking Safety) reducing substance use post-treatment, though these effects weren't maintained at follow-up [4, 9]. Notably, existing efficacious treatments for substance use maintained their effectiveness in dually diagnosed patients [6]. Individual studies provided more granular evidence regarding specific intervention approaches and their impact on substance use outcomes. Programs with integrated mental health services demonstrated that increased utilization of psychological services was associated with reduced heroin use at follow-up while integrated treatment approaches showed advantages over parallel treatment in reducing the use of higher-cost crisis-oriented services, which likely reflected reduced substance use [8, 3]. Similarly, co-located outpatient care showed provisional evidence for reductions in substance use and related harms, though these findings were accompanied by a high risk of bias [5].

The Individual Placement and Support model demonstrated strong evidence supporting its impact and effectiveness for persons with substance use disorder [10]. However, some studies showed fewer positive results, with one early trial finding no significant improvement in substance use outcomes with the addition of an innovative program [7].

These findings reveal a complex picture of substance use outcomes in integrated treatment programs. While most studies (n=8; 80%) reported improvements or effectiveness of interventions for substance use outcomes, the quality and strength of these findings varied considerably. Several important limitations must be considered. Foremost, the evidence quality was often rated as low, with multiple studies noting methodological weaknesses or high risk of bias [5, 10]. The effectiveness of specific program components was difficult to isolate, and long-term maintenance of treatment gains was inconsistent across studies. Treatment engagement and completion remained a significant challenge and the translation of positive findings into clinical practice faced several barriers, including episodic treatment patterns and clinical instability [10, 11]. While the overall evidence supports the effectiveness of integrated treatment approaches for substance use outcomes, the varying quality of evidence and presence of implementation challenges suggests the need for more rigorous

research to establish optimal program components and delivery methods for sustained substance use reduction. Table 2 outlines the combined treatment outcomes and some future directions.

Table 2: Combined Treatment Outcomes

Program Type	Mental Health Effect	Substance Use Effect	Treatment Completion Rate	Future Directions
Innovative group plus intensive case management.	One-year follow-ups detected no significant advantages on patient outcomes for adding the innovative program to usual services.	One-year follow-ups detected no significant advantages on patient outcomes for adding the innovative program to usual services.	Failure to engage patients in the experimental program posed a major and enduring barrier to treatment, despite intensive case management.	Future efforts must consider effective engagement techniques and patients' readiness for active treatment.
Integrated residential substance use disorder plus mental health.	Individuals treated in programs that provided specific dual diagnosis services subsequently had higher rates of utilizing mental health services over six months and, in turn, showed significantly greater improvements in psychological functioning (as measured by the Brief Symptom Inventory and the RAND Health Survey 36-item short form) at follow-up.	More use of psychological services was also associated with less heroin use at follow-up.	African Americans reported poorer levels of psychological functioning than others and were less likely to be treated in programs that provided mental health services.	Study findings support continued efforts to provide specialized services for individuals with co-occurring disorders within substance abuse treatment programs as well as the need to address additional barriers to obtaining these services among African Americans.
Integrated versus parallel	Greater reduction in psychiatric hospitalization.	Reduced use of crisis services.	The results of this study support the enhanced effectiveness of integrated treatment in decreasing the use of higher cost crisis-oriented services in clients with severe mental illness and substance use disorders.	To advance our understanding of integrated treatment effectiveness, future research should employ robust controlled study designs that comprehensively assess both mental health and substance use outcomes across multiple domains. Studies should incorporate extended follow-up periods to better evaluate the sustainability of treatment impacts, as current evidence shows inconsistent long-term outcomes and benefits.
Trauma-focused psychological therapy plus substance use disorder	Evidence showed that individual trauma-focused psychological therapy delivered alongside SUD therapy did better than TAU/ minimal intervention in reducing PTSD severity post-treatment and at long-term follow-up, but only reduced SUD at long-term follow-up. All effects were small, and follow-up periods were generally quite short.	Small effect at long-term follow-up. Group therapy reduced use post-treatment only.	Low to very low evidence quality. Fewer participants completed trauma-focused therapy while non-trauma-focused therapies showed no significant benefits.	Individuals with more severe and complex presentations (e.g. serious mental illness, individuals with cognitive impairment, and suicidal individuals) were excluded from most included studies and so the findings are not generalisable to such individuals. Some studies suffered from significant methodological problems while others were underpowered, limiting the conclusions that can be drawn. Further research is needed in this area.

Integrated care models.	Integrated models demonstrated improvement in mental health, including a reduction in substance use disorders.	Integrated models demonstrated superiority to standard care models through reductions in substance use disorders and improvement of mental health in patients who had diagnoses of concurrent disorders.	Not mentioned.	Available evidence suggests that integrated care models for concurrent disorders are the most effective models for patient care. More research is needed, especially around the translation of research findings to policy development and, vice versa, around the translation from the policy level to the patients' level.
Integrated psychosocial.	Integrating outpatient mental health and substance abuse treatments into a single package was effective. Integrated residential treatment was helpful for individuals who do not respond to outpatient interventions.	Individualized/ long-term programs were especially effective. Substance abuse treatments into a single package were effective.	Specific completion rates were not provided for participation in integrated psychosocial interventions.	To refine and test individual components and combinations of integrated treatments.
Combined pharmacological/psychotherapeutic.	Second generation antipsychotics were more effective for treatment of schizophrenia and comorbid substance use. The evidence suggests clozapine, olanzapine and risperidone are among the best. Clozapine appears to be the most effective of the antipsychotics for reducing alcohol, cocaine and cannabis abuse among patients with schizophrenia while motivational interviewing had robust support as a highly effective psychotherapy for establishing a therapeutic alliance.	The evidence suggests that antidepressants prescribed to improve substance-related symptoms among patients with mood and anxiety disorders were either not highly effective or involve risk due to high side-effect profiles or toxicity. However, Clozapine appears to be the most effective of the antipsychotics for reducing alcohol, cocaine and cannabis abuse among patients with schizophrenia. Motivational interviewing has robust support as a highly effective psychotherapy for establishing a therapeutic alliance.	Not mentioned	Creative combinations of psychotherapies, behavioural and pharmacological interventions offer the most effective treatment for comorbidity. Intensity of treatment must be increased for severe comorbid conditions such as the schizophrenia/cannabis dependence comorbidity due to the limitations of pharmacological treatments.

Psychosocial/medication.	Although no treatment was identified as efficacious for both psychiatric disorders and substance-related disorder, this review finds: (1) existing efficacious treatments for reducing psychiatric symptoms also tend to work in dual-diagnosis patients, (2) existing efficacious treatments for reducing substance use also decrease substance use in dually diagnosed patients, and (3) the efficacy of integrated treatment is still unclear.	The study found that no single treatment was consistently effective for both substance use and psychiatric domains simultaneously, though existing efficacious treatments for substance use were effective at decreasing substance use in patients with dual diagnosis.	Detailed program completion rates were not comprehensively reported across most studies	This study was constrained by the exclusion of severe comorbidity cases, limited direct comparisons between integrated and non-integrated models, and insufficient isolation of specific intervention components' effects, underscoring the necessity for more rigorous research methodologies and comprehensive evaluation of integrated treatment approaches, particularly in diverse and complex patient populations.
Co-located outpatient.	We found provisional evidence that integrated care that includes co-located mental health care and AOD specialist treatment is associated with reductions in substance use and related harms and mental health symptom severity, improved quality of life, decreased emergency department presentations/ hospital admissions and reduced health system expenditure.	Provisional evidence that co-located outpatient care led to reductions in substance use and related harms.	Completion rate was not mentioned.	Research is needed to better understand how to improve treatment engagement and completion rates.
Individual Placement and Support, IPS.	Effective for substance use disorder plus mental health.	Effective for substance use disorder.	Barriers to implementation noted.	Primary areas for future development. Research needs to address challenges related to episodic treatment patterns. Solutions are needed for managing clinical instability and relapse issues in the IPS model.

Combined Treatment Effect

The evidence from this review demonstrates a predominantly positive pattern of outcomes for integrated treatment approaches in addressing co-occurring substance use and mental health disorders (table 2). Eight of the ten included studies reported improvements in both mental health and substance use outcomes when utilizing integrated treatment models [1-6, 7, 10]. The consistency of these findings across multiple study designs, including systematic reviews, randomized controlled trials, and observational studies, suggests a robust treatment effect, although methodological limitations were noted in several studies. Specific improvements were observed across various outcome domains. In terms of mental health, some studies reported reduced psychiatric hospitalizations, enhanced psychological functioning, and decreased post-traumatic stress disorder severity [3, 8, 9]. Substance use outcomes showed similar positive trends, with studies documenting reduced heroin use, decreased crisis service utilization, as well as effective treatment of alcohol and cannabis use disorders [3, 4, 8]. These improvements were particularly notable in programs incorporating key components such as on-site mental health services, specialized staff training, intensive case management, and co-location of services [1, 3]. Despite these encouraging findings, several important considerations emerge from the analysis. While integrated treatments generally outperformed parallel or non-integrated approaches, engagement and completion remained a significant challenge [7, 9]. The evidence quality varied across studies, with some reporting high risk of bias or methodological weaknesses [3, 8-10]. These limitations suggest that while integrated treatment approaches show promise, there remains a need for more rigorous research to strengthen the evidence base and identify optimal implementation strategies for different population subgroups.

For clinical practice and service improvement, this review suggests several key implications. First, the evidence supports implementing specific service components that enhance treatment impact and effectiveness. These include incorporating on-site mental health services, employing specialized trained staff, providing intensive case management, and utilizing evidence-based approaches such as motivational interviewing and contingency management [5, 10]. The co-location of services and care coordination appear particularly important for improving outcomes, suggesting that healthcare organizations should prioritize integrated service delivery models over parallel treatment approaches [5].

Similarly, services should address common implementation challenges. Regarding this, key barriers identified include poor treatment engagement disparities in access and difficulties with treatment completion [7-9]. Clinical programs should develop specific strategies to address these issues, such as enhanced engagement protocols and accessibility improvements. The evidence suggests that individualized, long-term approaches may be more impactful and effective than short-term interventions, indicating the need for sustained treatment support [1]. Furthermore, service improvements should focus on several critical areas that incorporate comprehensive care models that address both mental health and substance use simultaneously while strengthening staff training in integrated treatment approaches in addition to implementing robust care coordination mechanisms across both mental health and substance-use treatment services [3-5]. Other improvement indicators identified as a major service gap requires addressing clinical instability through flexible service delivery and establishing clear outcome monitoring systems to track both mental health and substance use outcomes [6, 10]. Nonetheless, services should note that while integrated treatment models show promise, implementation requires careful attention to methodological quality and systematic evaluation of program outcomes and long-term impact while prioritizing cost-effectiveness in their service design, though detailed cost data was limited in the included studies.

Cost-Effectiveness and Implementation Barriers

The cost-effectiveness data was limited, with only one study specifically addressing this aspect, indicating that integrated care models were cost-effective [2]. However, the report identified several significant implementation barriers across studies, including methodological and quality issues (high risk of bias in research methodology; limited number of randomized controlled trials; challenges in translating findings to policy [5, 6,]. Additionally, clinical and practical barriers were also identified. These included treatment engagement and completion difficulties, challenges with episodic treatment patterns and clinical instability, access disparities, particularly noted for African American populations as well as issues with patient engagement and program completion [7-10].These findings suggest that despite integrated care models showing promise for cost-effectiveness, significant implementation challenges need to be addressed to optimize program delivery and outcomes. Table 3 illustrates the cost-effectiveness and implementation barriers identified in this review.

Table 3: Cost-Effectiveness and Implementation Barriers

Implementation Model	Key Components & Cost-Effectiveness	Success Factors	Barriers
Integrated group plus case management.	Group therapy, intensive case management. No specific cost-effectiveness data was provided.	Potential for comprehensive care.	Failure to engage patients in the experimental program posed a major and enduring barrier to treatment, despite intensive case management.
Integrated residential substance use disorder plus mental health.	On-site mental health, specialized staff. Integrated residential substance use disorder plus mental health. There was no specific information provided about the cost-effectiveness of the integrated residential substance use disorder plus mental health mode	Improved psychological functioning, reduced heroin use.	Disparities in access for African Americans. African Americans reported poorer levels of psychological functioning than others and were less likely to be treated in programs that provided mental health service.

Integrated versus parallel.	Integrated service delivery decreases the use of higher cost crisis-oriented services in clients with severe mental illness and substance use disorders.	Comparisons indicated that the integrated group achieved greater reductions in the incidence of psychiatric hospitalization and arrest. This supports the enhanced impact of integrated treatment in decreasing the use of higher cost crisis-oriented services in clients with severe mental illness and substance use disorders.	Not mentioned
Trauma-focused psychological therapy plus substance use disorder.	Cognitive behavioural therapy, trauma focus, substance use disorder adjunct. Economic importance (cost-effectiveness) of this program was not mentioned.	Evidence showed that individual trauma-focused psychological therapy delivered alongside SUD therapy did better than TAU/minimal intervention in reducing PTSD severity post-treatment and at long-term follow-up, but only reduced SUD at long-term follow-up.	There was evidence that fewer participants receiving trauma-focused therapy completed treatment, with little evidence to support use of non-trauma-focused individual- or group-based integrated therapies. Individuals with more severe and complex presentations (e.g. serious mental illness, individuals with cognitive impairment, and suicidal individuals) were excluded.
Integrated psychosocial.	Individualized, motivational, skills/supports. Cost-effectiveness of this program component was not mentioned.	Effective for non-responders to outpatient. Evidence suggests that integrated residential treatment, especially long-term (one year or more) treatment, is helpful for individuals who do not respond to outpatient dual disorders interventions.	Though there were methodological challenges, the cumulative evidence supports integrating outpatient mental health and substance abuse treatments into a single, cohesive package.
Integrated care models.	Integrated mental health/substance use disorder care. Integrated model was more cost-effective than standard care.	Integrated models demonstrated superiority to standard care models through reductions in substance use disorders and improvement of mental health in patients who had diagnoses of concurrent disorders.	The translation of research findings to policy development was lacking and, vice versa, around the translation from the policy level to the patients' level.
Combined pharmacological/ psychotherapeutic.	Motivational interviewing, cognitive behavioural therapy, contingency management, case management. Cost-effectiveness was not address.	Effective for severe comorbidity. Highly structured therapy programs that integrated intensive outpatient treatments, case management services and behavioural therapies such as Contingency Management (CM) are most effective for treatment of severe comorbid conditions.	Comorbidities were excluded from this study.
Psychosocial/medication.	Psychosocial and medical treatments.	Some efficacy in dual diagnosis was observed.	Limited number of studies conducted within different comorbid subgroups.

Co-located outpatient.	Co-location, care coordination. This approach had some economic benefit. However, this was not explicitly addressed.	There was provisional evidence that integrated care that includes co-located mental health care and AOD specialist treatment is associated with reductions in substance use and related harms and mental health symptom severity, improved quality of life, decreased emergency department presentations/hospital admissions and reduced health system expenditure.	Relatively high risk of bias was identified, and it was not possible to disaggregate the independent effect of physical co-location from other common aspects of integrated care models such as care coordination and the integration of service processes.
Individual Placement and Support	Key components of zero exclusion, rapid competitive job search, and incorporation with treatment services as well as benefits are components that make IPS a strong practice to incorporate into substance abuse treatment. However, its economic advantages were not addressed.	Effective for substance use disorder/comorbid. There was high evidence to support to application of IPS for persons with SUD, both singly and when combined with a mental health disorder.	Barriers to IPS implementation included episodic treatment, risk of relapse, and housing or criminal justice instability made the IPS program a useful best practice to consider for this population.

Key Program Components

The findings from this review demonstrate that rehabilitation programs for adults with co-morbid substance-use and mental health disorders have several essential components that characterize impactful and effective integrated care models. For instance, key structural components consistently identified across studies include on-site mental health services, specialized staff training, and co-location of services, as well as intensive case management, motivational interviewing, and contingency management approaches. The evidence suggests that integrated service delivery models demonstrate superior outcomes compared to parallel treatment approaches, particularly in reducing psychiatric hospitalizations and crisis service utilization. Additionally, programs incorporate individualized approaches and comprehensive care coordination showed promise in addressing both mental health and substance use outcomes. In terms of clinical practice, the findings emphasized the importance of combined pharmacological and psychotherapeutic interventions, with evidence supporting the effectiveness of newer-generation antipsychotics and motivational interviewing for comorbid populations [12].

Trauma-informed approaches were identified as critical program component of rehabilitation of comorbid population. However, these require careful implementation due to completion challenges. From a policy implementation perspective, several critical considerations emerged, including cost-effectiveness of integrated models, though more robust economic evaluations are needed as well as the necessity of addressing implementation barriers such as engagement challenges and service access disparities. Additionally, the translation of research findings into policy also faces barriers related to limited study quality and implementation challenges.

Success Factors

The evaluation of rehabilitation programs for adults with co-morbid disorders highlights several well-supported factors that contribute to their success and have important implications for both clinical practice and policy. Most notably, the evidence points to integrated care models as producing beneficial results across a range of outcome areas [1-6, 8, 10]. Integrated models led to better psychological functioning, fewer psychiatric hospitalizations, decreased substance use and related harms, and improved patterns of service use [1, 2, 8]. However, important methodological and practical limitations should be considered when evaluating rehabilitation programs for co-morbid disorders, highlighting key areas for future research. The current evidence base is marked by methodological limitations and potential risks of bias in study designs, including a limited number of randomized controlled trials and difficulties in identifying the independent effects of specific program components [5, 6, 9]. Barriers such as low engagement, unequal access, and difficulty maintaining clinical stability require further studies [7, 8, 10]. Future research priorities involve employing more rigorous methodological standards, conducting comprehensive economic evaluations, and systematically assessing implementation strategies across varied populations and contexts. Furthermore, studies should facilitate the integration of research outcomes into policy frameworks and explore impactful and effective mechanisms for improving treatment engagement and completion rates [1, 9].

Longitudinal studies are needed to assess how sustainable integrated care models affect clinical outcomes and service use for people with both mental health and substance use disorders, especially by identifying which program aspects drive lasting benefits [1, 3, 4, 6]. Evidence indicates that coordinated efforts in combining clinical skills, organizational assistance, and policy support are essential for effective implementation. Therefore, future research should overcome current methodological weaknesses and focus on strategies that achieve meaningful, long-term results.

Discussion

This review found that integrated rehabilitation programs for adults with both substance-use and mental health disorders yield better outcomes than non-integrated models, with eight out of ten studies indicating that integrated interventions were associated with changes in mental health and substance use outcomes [1-6, 8, 10]. For instance, integrated programs were linked to fewer psychiatric hospitalizations, less use of crisis services, and better psychological functioning. Nonetheless, this review found important knowledge gaps. First, despite integrated care appearing superior, few direct comparisons exist. Only three studies have expressly compared integrated and non-integrated models, indicating a notable gap in evidence. This review identified significant methodological flaws in current literature, including substantial risk of bias, confounding factors, and low evidence quality. Additional studies, including randomized controlled trials, are required. Implementation science also remains underexplored.

Moreover, key program elements like on-site mental health services, specialised staff training, and intensive case management were identified, but their individual impacts are still uncertain. Common barriers included engagement difficulties, problems completing treatment, and disparities in access. This review identified key components of rehabilitation service delivery, with studies highlighting the benefits of co-located services, care coordination, and individualized approaches [1, 4]. The review also noted difficulties in applying these findings, with several studies citing barriers to implementation and policy translation. There is a significant lack of data on treatment completion rates and long-term outcomes, with only three studies covering completion and limited long-term follow-up. This is notable given the chronic nature of co-morbid disorders. Cost-effectiveness data were also scarce, with just one study addressing it [12]. This limitation challenges policy makers and service planners aiming to implement evidence-based programs. This review documents key components of effective integrated programs and highlights major methodological and practical issues in dual diagnosis service delivery. It calls for more rigorous research, better implementation studies, and greater focus on long-term outcomes and cost-effectiveness in integrated rehabilitation for adults with comorbid substance use and mental health disorders. These findings inform future research and provide practical guidance for program development and policy making [13].

Conclusion

This review shows compelling evidence that integrated rehabilitation is effective for adults with both substance use and mental health disorders. However, there is limited research on its long-term impact after treatment. Precisely, integrated programs have been associated with reductions in psychiatric hospitalizations, improvements in psychological functioning, and decreases in substance use when compared to non-integrated approaches. Additionally, the methodological quality of current evidence should be carefully assessed, as most studies are systematic reviews (7 out of 10), highlighting the need for more rigorous primary research, particularly randomized controlled trials. In consonance with this, implementation analysis identified shared success factors and notable barriers that limit treatment outcomes, highlighting key evidence gaps. These include few direct comparisons between integrated and non-integrated models, limited data on treatment completion, and a lack of long-term outcome measures. The review also notes difficulty in isolating the impact of individual components within integrated care models.

The findings highlight the need for more rigorous research, greater focus on implementation science, and thorough evaluation of cost-effectiveness. Future studies should also investigate treatment completion rates and long-term impacts on patients with co-morbid disorders. Although integrated care is supported, ongoing research is needed to address quality and implementation challenges and to improve rehabilitation programs for this complex population in ways that are relevant to service delivery and policy.

Quality Appraisal of Included Studies Based on PRISMA-ScR. PRISMA-ScR recommends noting evidence limitations or variability in scoping reviews, which this synthesis does, even though formal critical appraisal is not always required. Table 4 presents the quality appraisal of the included studies based on PRISMA-ScR.

Table 4: Quality Appraisal of Included Studies (Based on PRISMA-ScR)

NO.	Author &Year	Study Design	Risk of Bias	Evidence Quality	Follow-up Duration	Outcome Clarity	Comments
1	Lehman et al., (1993)	RCT	Moderate to High	LOW	1 Year	Poor	No significant outcome; poor engagement.
2	Grella & Stein (2006)	Observational	Moderate	Moderate	6 Months	Good	Improved mental health and reduced heroin use; subgroup disparities
3	Mangrum et al., (2006)	Quasi-Experimental	Moderate	Moderate	1 Year	Good	Integrated care superior; limited design rigor.
4	Roberts et al., (2016)	Systematic Review + Meta	High	Very Low	≤7 months	Partial	Small PTSD effects; SUD improvements only long-term.
5	Karapareddy, (2019)	Systematic Review + Meta	Low	Moderate to High	Mixed	Good	Strong support for integrated care; cost-effective.

6	Drake et al., (2004)	Systematic Review	Moderate	Moderate	Mixed	Partial	Long-term care emphasized. individualization noted
7	Kelly et al., (2012)	Systematic Review	Low to Moderate	Moderate	Not specified	Good	Strong evidence for combined pharmaco-psychotherapy.
8	Tiet & Mausbach, (2007)	Systematic Review	Moderate to High	Low	Mixed	Partial	Unclear efficacy. Integrated models not isolated.
9	Glover-Wright et al., (2023)	Systematic Review	High	Low	Mixed	Partial	High bias risk. Co-location effects not disentangled.
10	Harrison et al., (2019)	Systematic Review	Moderate	Moderate	Not specified	Good	Strong support for IPS. Barriers noted

PRISMA-ScR-Oriented Appraisal Summary

1. Reporting Transparency: Most studies satisfied key PRISMA-ScR criteria, including explicitly stated objectives, well-defined populations, and thoroughly described interventions. Nevertheless, only three studies included comprehensive information on follow-up outcomes.
2. Evidence Gaps: The review indicates a limited availability of randomized controlled trials (with only one identified), and several systematic reviews incorporated studies with varying quality and consistency.
3. Bias and Limitations: The scoping review identified methodological limitations in seven of the ten studies, including small sample sizes, non-randomized study designs, and the exclusion of severe cases.
4. Outcome Reporting: Outcome domains such as mental health, substance use, and psychosocial functioning were commonly reported, while data on completion rates and long-term impacts were not provided in most studies.
5. Cost-effectiveness Data: The literature contains limited information on cost-efficiency, with only a single study explicitly addressing this aspect.

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