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REVIEW ARTICLE

Inter-organizational collaboration in drug treatment and rehabilitation: A scoping review

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ABSTRACT

Background: 'Inter-organizational collaboration' and 'partnership' have been emphasized in drug treatment and rehabilitation over the decades. Nevertheless, the synthesis of knowledge of related arrangements has been limited in scope. This study fills a gap by systematically reviewing the features, outcomes, facilitators, and barriers of inter-organizational collaborations in drug rehabilitation to propose insights to improve policy and practice.

Methodology: This review is based on searches of MEDLINE, CINAHL Complete, Embase, and PsychINFO databases. All retrieved papers were independently screened and underwent quality assessment based on the protocol proposed by Peters *et al.* (2017). Data charting from the included sources was performed using NVivo.

Results: A total of 5,631 unique records were retrieved, of which 54 were included in the analysis. Most of the papers were published between 2011 and 2019, and primarily described, or tested, a collaborative activity from a case study or survey research. Treatment services were often partnered with public health, primary care, or social service organizations. The outcomes of initiatives were commonly about the increase in service utilization or the enhancement of service provision. Facilitators and barriers to collaboration were reported by two-thirds of the papers, which primarily pertained to contextual or organizational dimensions.

Conclusion: This piece of evidence provides good descriptive content on what, how, and how well the inter-organizational collaborations have been conducted in drug treatment and rehabilitation. Implications for promoting good practices that range from University education, staff exchange, and incentives to support by governments are discussed.

Keywords: intersectoral collaboration, substance-related disorders/therapy, substance abuse treatment centers, Scoping Review

Introduction

Persons who use drugs (PWUD) are at risk for, and often presented with, concurrent medical, mental, social, and legal problems, which determines the type of services they require, and affects their willingness and ability to access and continue appropriate, evidence-based treatment [1-5]. Thus, the problems confronting PWUDs are multi-dimensional and necessitate the design of interventions from medical, psychiatric/psychological, social, and legal services [6]. Drug rehabilitation organizations can strategically respond to these problems by developing services internally or entering into partnerships and alliances with others already providing the services [7]. The latter is referred to as collaboration which is broadly defined as initiatives implemented by two or more organizations to attain a shared goal [8].

Collaboration has been conceptualized and measured in empirical papers in the drug rehabilitation and drug policy field. Recent reviews, either published as standalone papers or as extended sections of empirical papers, which attempted to synthesize the evidence with respect to collaboration have been limited by scope. Specifically, these published papers only synthesized the evidence for collaboration between treatment and either criminal justice [9], child welfare [8,10,11], or mother-child [12] programs and services. Other

possible collaborative arrangements may be excluded given the complexity of a PWUD's presenting problem.

This review intends to fill this knowledge gap by studying the existing landscape of research on collaboration (*concept*) – which is a joint activity between two groups at least. Collaboration is implemented in any setting or country (*context*) for PWUD who are undergoing/have undergone treatment and rehabilitation for drug dependence (*population*). Specifically, this piece of reviews examines the purposes, geographic scope, nature of partnerships, outcomes, facilitator, and barriers of collaboration across sectors in drug rehabilitation initiatives and hopes to conclude with some insights for improving and enriching drug rehabilitation services.

Methodology

Search Strategy

The search strategy for this scoping review [13-15] is set according to the review protocol proposed by Peters *et al.* [16]. First, a preliminary search in MEDLINE (via EBSCOhost) was conducted to generate a list of possible keywords and synonyms for 'collaboration' and 'drug rehabilitation', which are the key ideas of interest in this review. The perusal of the resulting 29 papers from 181 records retrieved from the preliminary search resulted in the inclusion of eight terms. Thus, the expanded search strategy included 'collaborate/ collaboration/collaboratives', 'partnership', 'cooperation', 'coordination', 'linking/linkage', and 'coalition' for the *concept*, and 'drug rehabilitation', 'substance-related disorders rehabilitation', 'drug treatment', 'addiction treatment', and 'substance abuse treatment' for *population*. Terms for *context* were not included in the search because this review was interested in retrieving information for all settings or countries where collaboration was reported. Table 1 presents the search strategy used for each database.

Eligibility Criteria and Study Selection

The following eligibility criteria were applied when choosing potentially relevant studies:

a. Studies which discuss the *population* and *concept* of interest were included.

Table 1. *Search Strategy Used for the Scoping Review*

MEDLINE (via EBSCOhost)	CINAHL Complete (via EBSCOhost)	Embase	PsychINFO (via ProQuest)
((MH "Substance Abuse Treatment Centers") OR (MH "Substance-Related Disorders/RH/TH") OR (TX "drug rehabilitation" OR TX "drug treatment" OR TX "addiction treatment" OR TX "substance abuse treatment" OR TX "substance abuse rehabilitation")) AND ((MH "Intersectoral Collaboration") OR (TX (collaborate OR collaboration OR collaborative) OR TX partnership OR TX cooperation OR TX (linking OR linkage) OR TX coalition))	((MH "Drug Rehabilitation Programs") OR (MH "Substance Use Rehabilitation Programs") OR (TX "drug rehabilitation" OR TX "drug treatment" OR TX "addiction treatment" OR TX "substance abuse treatment" OR TX "substance abuse rehabilitation")) AND ((MH "Collaboration") OR (MH "Consortia") OR (MH "Coalition") OR (TX (collaborate OR collaboration OR collaborative) OR TX partnership OR TX cooperation OR TX (linking OR linkage) OR TX coalition))	('drug addiction therapy'/exp OR 'drug dependence treatment'/exp OR 'dehabituation, drug' OR 'drug abuse treatment' OR 'drug dehabituation' OR 'drug dependence treatment' OR 'drug rehabilitation program' OR 'drug rehabilitation programme' OR 'substance abuse treatment centers' OR 'substance abuse treatment' OR 'substance abuse rehabilitation') AND ('collaboration'/exp OR 'cooperation'/exp OR 'partnership'/exp OR linkage OR linking OR coalition)	((MAINSUBJECT.EXACT.EXPLODE("Addiction Treatment") OR MAINSUBJECT.EXACT.EXPLODE("Substance Use Treatment")) OR (ab("drug rehabilitation") OR ti("drug rehabilitation") OR ab("drug treatment") OR ti("drug treatment") OR ab("addiction treatment") OR ti("addiction treatment") OR ab("substance abuse treatment") OR ti("substance abuse treatment") OR ab("substance abuse rehabilitation") OR ti("substance abuse rehabilitation"))) AND ((MAINSUBJECT.EXACT.EXPLODE("Collaboration") OR MAINSUBJECT.EXACT.EXPLODE("Cooperation") OR MAINSUBJECT.EXACT.EXPLODE("Coalition Formation")) OR (ab(collaborate OR collaboration OR collaborative) OR ti(collaborate OR collaboration OR collaborative) OR ab(partnership) OR ti(partnership) OR ab(cooperation) OR ti(cooperation) OR ab(linking OR linkage) OR ti(linking OR linkage) OR ab(coalition) OR ti(coalition)))

b. Peer-reviewed, scholarly empirical papers which include identifiable methods from which results were derived were included. Editorials, commentaries, letters to the editor, extended essays, and conference reports were excluded.
c. Studies published in English were included.

An expanded search was carried out in four major databases for medical and social sciences (i.e., MEDLINE via EBSCOhost, CINAHL Complete via EBSCOhost, Embase, and PsychINFO via ProQuest) using index terms and keywords combined for maximum sensitivity. The inclusive search period was from database inception to the time of search (November 2019).

The automated and manual deduplication of search results was conducted using EndNote (X9.2, Clarivate Analytics, 2019). Title and abstract were screened for relevance by two independent assessors (i.e., the author and a PhD student from another institution), and disagreements were settled by consensus. The full text of eligible records was retrieved from the electronic collection/subscription of the libraries of The Hong Kong Polytechnic University (n = 234), The Chinese University of Hong Kong (n = 17), Brown University (n = 10), and University of the Philippines (n = 10). Full-text screening was conducted by the author and confirmed by two independent assessors, and disagreements were settled by consensus. Reference list of full-text papers were reviewed to identify additional papers to include in the review.

Data Extraction and Analysis

Data from the included sources of evidence were charted by the leading author using NVivo 12 Pro for Windows [17,18]. A coding structure was developed based on the preliminary reading of the first 10 papers to capture the key data points of interest and address the aim of the review.

Papers were imported from EndNote into NVivo in Portable Document Format. Passages (i.e., sentences or paragraphs) from each article which were deemed relevant to the data extraction points were coded to the appropriate node. 'Framework matrices' and 'Matrix coding query' functions were used to analyze the extracted data. Results were summarized as the level of intensity, or the number of articles, corresponding to each item above.

This review was prepared in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) [19].

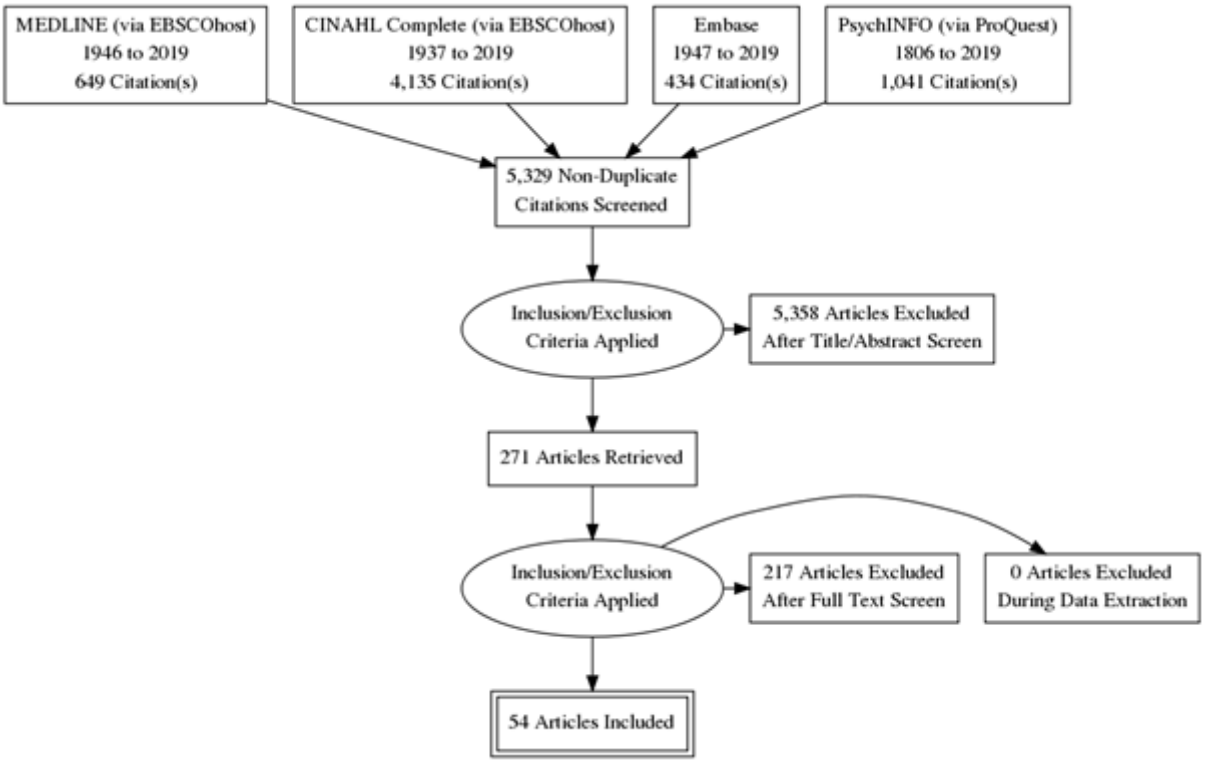

Figure 1. *Study flow diagram*

Results

Selection of Sources of Evidence

A total of 5,631 unique records were retrieved from a comprehensive search of four databases, of which 5,358 records were excluded after title and abstract screening due to irrelevance to the eligibility criteria (Figure 1). The full text of the remaining 271 records were retrieved and assessed; 217 records were found to be ineligible after matching with the exclusion and inclusion criteria, of which 153 papers did not focus on a collaborative initiative as defined for this review; 13 papers had the wrong population; 50 were not empirical papers, and one record of the full-text was not located even after an exhaustive search across four libraries. Thus, 54 articles were included in the scoping review [8,9,12,20–70]. Details of the included articles can be found in Supplementary Table S1 and are briefly described below.

Characteristics of Sources of Evidence

The earliest record included in the analysis was published in 1990. Two papers were published in 2019. One-fourth (n = 28) of the papers included in the analysis were published between 2006 and 2010. Two out of five (n = 23) papers from the current decade were analyzed for this review. Nine out of 10 papers (n = 49) reported on a collaborative project or program located in North America, specifically the United States.

In terms of aim or purpose, more than half (n = 29) of the papers were descriptive (i.e., presents the organization/ structure, function/process, products/outcomes, and facilitators/barriers of a collaborative arrangement). A third (n = 17) of the papers were explanatory, testing of hypotheses or the efficacy/effectiveness of interventions. Few papers were evaluative (i.e., the assessment of a particular intervention or practice in real-life situations in the social world) or exploratory (i.e., the generation of initial insights into the nature of an issue).

Quantitative research, specifically survey research (n = 9), quasi-experiments with pre- and post- designs (n = 8), mixed-method approaches such as case studies (n = 18), or program/project evaluation (n = 6), accounted for approximately 90% of the methods utilized by the paper authors. Notably, a few of the collaborative initiatives were tested using a randomized trial design.

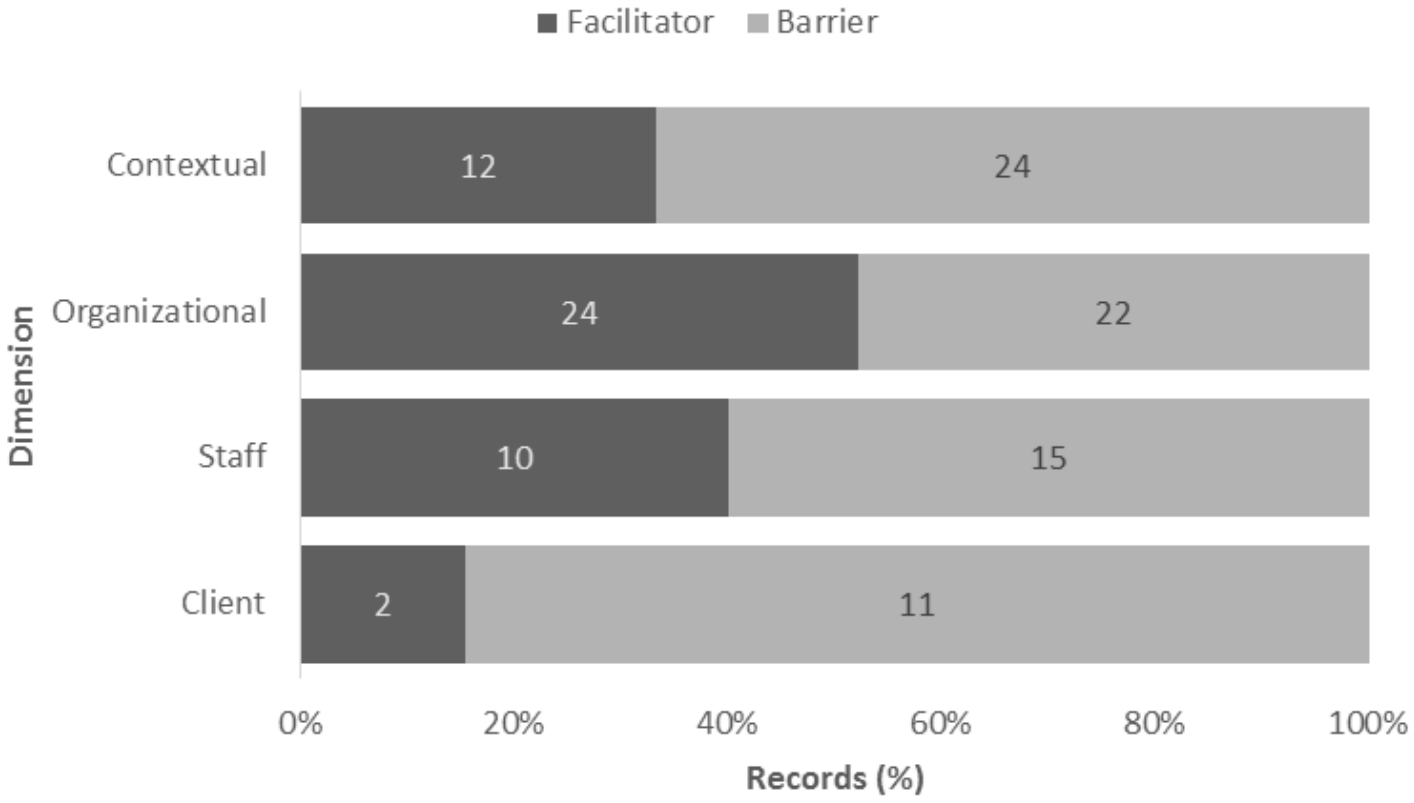

Figure 2. *Distribution of records by dimension of factors affecting collaboration (n = 36)*

Features of Collaborative Initiatives

Nearly half (n = 24) of the collaborative initiatives discussed in the included articles were existing programs, or were permanent or ongoing services of a group or organization. However, most of the initiatives were projects which were developed either as part of project demonstration grants (n = 20) or as part of a research project (n = 10).

Goals of collaboration. Four categories or clusters of project or program goals were identified from the included articles: a) increase client access to a particular service (n = 24), b) improvement of service coordination being offered by two or more groups (n = 6), c) enhancement of the provision of an existing service through the effort of two or more groups (n = 4), and d) development of a service offered under a collaborative arrangement (n = 2). Fourteen projects had dual goals, for example, increase of service access and improvement of coordination [8,27,49,50,54,55,70]. A specific goal was not stated nor could be inferred for four remaining papers [36–38,62], which could be attributed to the fact that the authors undertook an analysis for multiple collaborative arrangements.

Geographic scope of collaboration. Only six of the papers examined collaboration at a national scale, four of which utilized existing nationally-representative survey data [8,9,36,49]; the other two used data from a project information system established to track service recipients under a collaborative program [55] and a national evaluation of recipients of a grant for demonstration projects [61]. Almost all of the papers analyzed for this scoping review were focused on initiatives implemented at an institutional, county, or state level.

Collaborative arrangements. Two-thirds of the papers presented a partnership between two participating groups, one of which is involved in providing additional treatment services for PWUD. Their partner organizations come from the public health and primary care fields (n = 19); social services, including those providing child welfare and catering to victims of domestic violence (n = 9); the criminal justice system, specifically the courts, police, and correctional facilities (n = 8); and mental and psychiatric service providers (n = 4) [24,32,48,58]. Two partnerships were unique; one was between a government and private addiction treatment service providers [34], the other was between an addiction treatment service and a faith-based group [68]. Highly complex collaborative arrangements were reported in 12 papers in which more than two groups were reported to be working together to serve the needs of PWUDs. For example, Amaro *et al.* [21] reported on a partnership between treatment, mental health, and public health sectors.

Target client. The target clients of the collaborative programs and projects analyzed for this review were mainly PWUD who had a co-occurring medical, mental, and/or social problem. Seven papers described initiatives which focused on individuals without any co-occurring disorder [29,34,35,41,44,50,65]; one paper focused on pregnant women who had a substanceuse disorder [30].

Level of partnership. The classification of the level of partnership of the reported initiatives following the typology introduced by Konrad [71] showed that three predominant modes were used or demonstrated. Programs or projects at the lower end of the spectrum had some structure in terms of their partnership and utilized client referral and follow-up and joint staff meetings, in which case they were at the stage of cooperation and coordination (n = 18) (e.g., [25]). More structured efforts where participating groups enter into formal agreements, define common goals, establish an organizational structure, and engage in cross-training of staff, or at the level of collaboration, were reported in 22 papers (e.g., [20]). One-fourth of studies reported the highest level of integration in which a single entity manages and delivers an array of "seamless" services (e.g., [22]). None of the included studies utilized strategies which were limited at the information and communication or consolidation levels.

Outcomes of collaboration. Half of the papers measured and reported outcomes of the collaborative arrangements using quantitative or qualitative measures. The most commonly reported result of a collaboration was an increase in the utilization of services by target clients (n = 10) (e.g., [35]), followed by the enhanced quality of service provision (n = 7) (e.g., [23]); and the reduced use of drugs by target clients (n = 4) (e.g., [48]). One study reported an outcome of an improved partnership between the participating groups [20] and reduced reoffending by target client [26]. Four projects or programs reported the attainment of the following outcomes: improved partnership among participating groups and enhanced quality of service provision [32,42]; increased service utilization, reduced drug use among target clients [54]; and reduced reoffending and drug use of target clients [63].

Facilitators and Barriers of Collaboration

Facilitators and barriers to collaborations were identified in 36 (67%) of the papers [8,9,12,20–25,28,29,31,35–47,49, 50,52,53,55,58,62,64,66–68]. Papers may specify both but

authors frequently reported barriers at the contextual and organizational levels among the four domains (i.e., context, organization, staff, and client) (Figure 2). The list of facilitators and barriers to collaboration identified in this scoping review is presented in Table 2.

Contextual level. Positive factors at the contextual level (i.e., broader environment external to the initiative) include those related to the availability of policies which promote collaboration, resources availability to support the initiative, and geographic proximity of collaborating parties; barriers are related to the socio-economic situation of the locality or localities in which collaboration is implemented, policy restrictions and constraints, and differences in disciplinal orientations.

Organizational level. The three most common drivers identified from issues internal to the organization or unit involved in the initiative are the knowledge transfer and cross-training of staff, availability of communication and problem-solving mechanisms, and alignment of the institution's purpose and values with the collaboration goal. Absence of information and communication technology, resource constraints, and mistrust among partners were cited as organizational barriers to collaboration.

Staff. Partnerships are helped by the presence of staff involved in implementing the initiatives who have the right knowledge, skills, and attitude which complement the collaboration. In addition to the absence of positive attributes just mentioned, a staff-level barrier is the actual or perceived high demand on staff to implement activities under the collaborative arrangement.

Client. Client's readiness to participate, and the level of engagement in the activities of partnership arrangements, were identified as facilitators to collaboration. Meanwhile, the socioeconomic status, including the ability to pay for services offered by different agencies involved in the collaborative, were identified as a barrier.

Table 2. *Facilitators and Barriers to Collaboration*

	Facilitator	Barrier
Contextual	• Policies supporting collaboration (i.e., laws, regulations, incentives) • Availability of funding and other resources • Proximity of collaborating providers or organizations • Pressure from stakeholders to collaborate • History of prior collaboration • Commitment from partners	• Policies on (and competition for) financing and reimbursement for shared services • Local situation: Rural setting, geographic distance, low income, poor transportation, lack of community resources • Differences in professional and theoretical frameworks of disciplines • Legal and policy constraints (e.g., confidentiality, innovative services) • Mismatch between service developed and client needs or cultural practices • Limited time to implement collaborative arrangement (i.e., funded project)
Organizational	• Conduct of cross-training • Mechanism for communication, linkage and problem-solving • Alignment of organizational (and professional) purpose and values with collaborative arrangement • Stakeholder engagement • Skilled staff in sufficient numbers • Ability of partners to enter into flexible arrangements • Leadership buy-in and oversight • Presence of boundary-spanners • Clear delineation of boundaries and expectations	• Access to information technology, especially for tracking of clients • Lack of common time for activities (e.g., trainings, meetings) • Staff turnover and burnout • Scarcity of institutional resources (i.e., staff, funds) • Differences in institutional mandates and orientation to practice • Competition among partner institutions • Mistrust among partner institutions • Reliance on volunteer members or paid project staff
Staff	• Staff commitment and motivation • Regular communication • Positive attitude towards collaboration (e.g., readiness)	• Apprehension among managers and staff • High demands on staff to deliver services • Staff not possessing the right skills and disposition • Cultural competence
Client	• Client readiness and engagement	• Socioeconomic status and ability to meet basic needs • Clients not wanting services • Ability to pay for services, including insurance status

Discussion

Summary of Evidence

This review was performed to describe the current empirical research on collaboration in the context of drug treatment and rehabilitation. Search, retrieval, and review of records from four databases yielded 5,329 unique citations, 54 of which met the inclusion and exclusion criteria and were included in the analysis. Most papers were published in the current decade (i.e. between 2011 and 2020), and primarily described or tested the impact of a collaborative activity in the United States using data derived from a case study or survey research. These initiatives were research or demonstration projects implemented at the state or country level and were meant to increase access to services by PWUD with a concurrent medical or social problem. Treatment services were often partnered with public health/primary care or social service organizations and delivered through a partnership instituted at the level of collaboration or cooperation. The outcomes of initiatives were reported. These were commonly about the increase in service utilization by target client or the enhancement of service provision by participating groups. Facilitators and barriers to collaboration were reported by around two-thirds of the papers, which primarily pertain to the contextual or organizational dimensions.

The preponderance of papers from the United States may be explained by the nature of the reported initiatives. That is, these initiatives were mainly projects funded by an external organization which usually stipulate a published manuscript as part of the contractual arrangement for the grant. Two pairs of papers included in this review – McCarthy *et al.* [52] and Schlenger *et al.* [61], and Heckman *et al.* [45] and Veysey *et al.* [64] — were published in the same journal issue sponsored by the project. However, the initiatives reported in the reviewed papers are not the only collaborative arrangements in existence. The results of state or national surveys conducted by Bennett and Lawson [25], Rosenheck *et al.* [58], and Formica *et al.* [40], and the secondary analysis of national datasets by He [8] and D'Aunno *et al.* [36] indicate that unreported or undocumented formal and informal collaborative arrangements between treatment services and other agencies or organizations across the United States.

Reported initiatives as projects have created 'artificial' partnerships which were dependent on the availability of funding to support activities and short-term engagements which may not have allowed for sufficient planning or goal attainment (especially if they are not maintained after the termination of the grant). Such partnerships and engagements have been identified as barriers to collaboration [20,21,47,66].

Moreover, despite the complexity of the intersecting medical, social, economic, and legal needs of PWUD, only one in five papers reported on collaborative arrangements involving more than two sectors, organizations, or services [21,30,33,37,42,45,49,50,53,54,64,70]. When this situation is viewed from the fact that most of the papers published pertain to projects, the delimitation to two partner services may be driven by the goal of the grant and funding constraints.

Finally, most authors applied the terms 'cooperation', 'coordination', 'collaboration', and 'integration' rather loosely when describing their initiatives such that some of the terms were interchanged or even misapplied. Thus, part of the work that went into the analysis for this review was in classifying the type of collaborative arrangement being reported in papers, with the author relying on the description of the program or project and matching it with the characteristics of the different levels of collaboration.

Implications

Considering the review of partnership arrangement and the list of barriers and facilitators, the following approaches to promote or improve intersectoral collaboration in drug treatment and rehabilitation are worth contemplating.

The conceptualization and knowledge consolidation of inter-sectoral collaboration is the first approach. Efforts shall be made to encourage academics and researchers to utilize the terms 'cooperation', 'collaboration', and 'integration' in a well-defined and hierarchical manner. Mutual understanding across sectors of the interpretation and operational meaning attached to each term is necessary. This understanding is fundamental to have a high level of partnership.

This review concluded with speculation that many projects involving inter-organizations were left unreported and published in sites other than the United States. Thus, funding bodies supporting drug treatment and rehabilitation in other regions such as Europe, Asia, and Africa, can offer incentives to organizations to consolidate their experience of inter-sectoral collaboration. For example, the dissemination of the empirical study on inter-organizational efforts is an assessment criterion for funding support.

At an organizational level, a culture of promoting multi-disciplinary collaboration will be cultivated. Service

planning and delivery integrating staff members from diverse training backgrounds will be encouraged. These initiatives can be backed up by an open-minded leadership. Staff members will be encouraged to gain access to knowledge and skill training based on a different discipline. Building a sustainable partnership across disciplines will be explicit in an organizational mission.

University education will prepare students with competence for inter-sectoral collaboration. Innovation in curriculum design and learning activities may be involved. For example, the knowledge and skills for inter-agency collaboration are incorporated in the course syllabus. Students from legal, nursing, and social work disciplines may attend the same course and be encouraged to team up for learning projects. Bridging and linking students from different disciplines may enhance their social capital for inter-agency collaboration in their future careers.

Assistance can be offered to help service recipients eliminate resource and geographic constraints on gaining access to treatment and rehabilitation services by the improved utilization of digital social or clinical services. Service recipients do not need to travel much to access services provided by different sectors. Thus, providing subsidy to support the Internet expense of economically disadvantageous groups is a prerequisite.

Limitations

Two possible sources of bias may affect the quality of results reported in this review [72]. Pragmatic considerations resulted in the exclusion of non-English language publications, grey literature, and unpublished sources which may have introduced selection bias in this review. However, this may be partly off-set by the search strategy design to attain maximum sensitivity (i.e., the inclusion of papers as much as possible during the first-level search) across four databases such that 1% of the records retrieved were found to be relevant to the research question. Information bias in the form of study misclassification across the data points of interest is also a possibility given that only one reviewer undertook data extraction. To mitigate this possibility, papers included for analysis were read at least twice before data extraction and coding. Data in NVivo were also reviewed once all the papers have been coded but before undertaking analysis.

Conclusion

Currently available published empirical papers on collaboration in drug rehabilitation describe this phenomenon in the form of projects implemented in a single country. An opportunity for research on ongoing collaborative programs in other settings and jurisdictions is presented.

Publisher's Note

This paper was initially handled through the peer review and editorial process by the former Editor-in-Chief, Dr. Arnold V. Hallare. After his untimely passing, responsibility for handling the manuscript, including the decision on acceptance, was transferred to another senior Editorial Board member to avoid conflict of interest.

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SUPPLEMENTARY TABLE

Table S1. *Matrix of included papers*

SOURCE	CHARACTERISTICS OF ARTICLES			FEATURES OF COLLABORATIVE INITIATIVES						
	Country of origin	Aim of the paper	Method used	Nature	Goal	Geographic scope	Participants	Target client	Level of partnership	Outcomes
Abdel-Salam, *et al.* (2017) [20]	USA	Descriptive	Quasi-experiment	Research project	Improve service coordination	Sub-national	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Collaboration	Improved partnership among the participating groups
Amaro, *et al.* (2004) [21]	USA	Descriptive	Mixed method – Case study	Project demonstration	Develop new service	Sub-national	Treatment service + Mental and psychiatric service + Public Health and primary care	PWUD with co-occurring mental health + social problems	Collaboration	Not reported
Anastas, *et al.* (2019) [22]	USA	Descriptive	Mixed method – Evaluation	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring mental health problem	Integration	Not reported
Appel, *et al.* (2017) [23]	USA	Descriptive	Mixed method – Case study	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Collaboration	Enhanced quality of service provision
Barreira, *et al.* (2000) [24]	USA	Descriptive	Mixed method – Case study	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Mental and psychiatric service	PWUD with co-occurring mental health problem	Integration	Not reported
Bennett and Lawson (1994) [25]	USA	Exploratory	Survey	Program	Improve service coordination	Sub-national	Treatment service + Social service	PWUD with co-occurring social problem	Cooperation and coordination	Not reported
Best, *et al.* (2010) [26]	United Kingdom	Exploratory	Quasi-experiment	Project demonstration	Improve service coordination	Sub-national	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Cooperation and coordination	Reduced reoffending by target client
Bonham, *et al.* (1990) [27]	USA	Descriptive	Mixed method – Case study	Project demonstration	Increase client access to a service + Improve service coordination	Sub-national	Treatment service + Social service	PWUD with co-occurring social problem	Cooperation and coordination	Not reported
Bouis, *et al.* (2007) [28]	USA	Descriptive	Quasi-experiment	Research project	Develop new service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical + mental health problems	Integration	Enhanced quality of service provision
Bray and Rogers (1995) [29]	USA	Descriptive	Quasi-experiment	Project demonstration	Improve service coordination	Sub-national	Treatment service + Public Health and primary care	PWUD with no co-occurring disorder	Cooperation and coordination	Enhanced quality of service provision
Brindis, *et al.* (1997) [30]	USA	Evaluative	Mixed method – Evaluation	Project demonstration	Develop new service + Enhance service coordination	Sub-national	Treatment service + Social service + Public Health and primary care	PWUD who are pregnant	Cooperation and coordination	Enhanced quality of service provision
Clark, *et al.* (2017) [31]	USA	Descriptive	Qualitative	Program	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Collaboration	Not reported
Clodfelter, *et al.* (2010) [32]	USA	Descriptive	Mixed method – Case study	Program	Enhance provision of existing services	Sub-national	Treatment service + Mental and psychiatric service	PWUD with co-occurring mental health problem	Integration	Improved partnership among participating groups + Enhanced quality of service provision

SOURCE	CHARACTERISTICS OF ARTICLES			FEATURES OF COLLABORATIVE INITIATIVES						
	Country of origin	Aim of the paper	Method used	Nature	Goal	Geographic scope	Participants	Target client	Level of partnership	Outcomes
Coll, *et al.* (2010) [33]	USA	Explanatory	Quasi-experiment	Project demonstration	Improve service coordination	Sub-national	Treatment service + Social service + Criminal justice service	PWUD with co-occurring social problem	Cooperation and coordination	Enhanced quality of service provision
Crome, *et al.* (2000) [34]	United Kingdom	Descriptive	Mixed method – Case study	Project demonstration	Develop new service + Increase client access to a service	Sub-national	Public + Private Treatment service	PWUD with no co-occurring disorder	Collaboration	Enhanced quality of service provision
Darfler, *et al.* (2019) [35]	USA	Evaluative	Mixed method – Evaluation	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with no co-occurring disorder	Cooperation and coordination	Increase in service utilization by target clients
D'Aunno, *et al.* (2017) [36]	USA	Explanatory	Survey	Program	Not stated	National	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Cooperation and coordination	Not reported
Drabble (2011) [37]	USA	Descriptive	Mixed method – Case study	Program	Not stated	Sub-national	Treatment service + Social service	PWUD with co-occurring social problem	Collaboration	Not reported
Drabble and Poole (2011) [38]	Canada	Descriptive	Mixed method – Case study	Program	Not stated	Sub-national	Treatment service + Social service + Criminal justice service	PWUD with co-occurring social problem	Collaboration	Not reported
Drainoni, *et al.* (2014) [39]	USA	Evaluative	Mixed method – Evaluation	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Integration	Enhanced quality of service provision
Formica, *et al.* (2018) [40]	USA	Descriptive	Survey	Program	Increase client access to a service	Sub-national	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Collaboration	Not reported
Glenn and Moore, (2008) [41]	USA	Explanatory	Survey	Program	Increase client access to a service	Sub-national	Treatment service + Social service	PWUD with no co-occurring disorder	Collaboration	Not reported
Green, *et al*. (2008) [42]	USA	Descriptive	Qualitative	Program	Improve service provision + Enhance service coordination	Sub-national	Treatment service + Social service + Criminal justice service	PWUD with co-occurring social problem	Collaboration	Improved partnership among participating groups + Enhanced quality of service provision
Guerrero, *et al.* (2016) [43]	USA	Exploratory	Mixed method – Evaluation	Program	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Cooperation and coordination	Not reported
Gurewich, *et al.* (2014) [44]	USA	Descriptive	Mixed method – Case study	Program	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with no co-occurring disorder	Cooperation and coordination	Not reported
He (2015) [8]	USA	Explanatory	Survey	Program	Increase client access to a service + Improve service coordination	National	Treatment service + Social service	PWUD with co-occurring social problem	Collaboration	Not reported
He (2017) [9]	USA	Explanatory	Survey	Program	Increase client access to a service	National	Treatment service + Social service	PWUD with co-occurring social problem	Collaboration	Not reported

SOURCE	CHARACTERISTICS OF ARTICLES			FEATURES OF COLLABORATIVE INITIATIVES						
	Country of origin	Aim of the paper	Method used	Nature	Goal	Geographic scope	Participants	Target client	Level of partnership	Outcomes
Heckman, *et al.* (2004) [45]	USA	Descriptive	Mixed method – Case study	Project demonstration	Develop new service + Increase client access to a service	Sub-national	Treatment service + Social service + Mental and psychiatric service	PWUD with co-occurring social problem	Collaboration	Not reported
Huebner, *et al.* (2015) [46]	USA	Descriptive	Mixed method – Case study	Program	Improve service provision + Enhance service coordination	Sub-national	Treatment service + Social service	PWUD with co-occurring social problem	Collaboration	Increase in service utilization by target clients
Hunter, *et al.* (2005) [47]	United Kingdom	Evaluative	Mixed method – Case study	Program	Increase client access to a service	Sub-national	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Cooperation and coordination	Not reported
Iachini, *et al.* (2015) [12]	USA	Descriptive	Qualitative	Program	Enhance provision of existing services	Sub-national	Treatment service + Social service	PWUD with co-occurring social problem	Collaboration	Not reported
Kikkert, *et al.* (2018) [48]	The Netherlands	Explanatory	Controlled trial	Research project	Enhance provision of existing services	Sub-national	Treatment service + Mental and psychiatric service	PWUD with co-occurring mental health problem	Integration	Reduced drug use by target clients
Lee, *et al.* (2006) [49]	USA	Explanatory	Survey	Program	Increase client access to a service + Improve service coordination	National	Treatment service + Mental and psychiatric service + Public Health and primary care	PWUD with co-occurring medical + mental health problems	Cooperation and coordination	Not reported
Ma, *et al.* (2016) [50]	China	Descriptive	Qualitative	Program	Increase client access to a service + Improve service coordination	Sub-national	Treatment service + Criminal justice service + Public Health and primary care	PWUD with no co-occurring disorder	Collaboration	Not reported
Masson, *et al.* (2013) [51]	USA	Explanatory	Controlled trial	Research project	Enhance provision of existing services	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Cooperation and coordination	Increase in service utilization by target clients
McCarthy, *et al.* (1992) [52]	USA	Descriptive	Mixed method – Case study	Project demonstration	Improve service coordination	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Cooperation and coordination	Increase in service utilization by target clients
Mittal and Suzuki (2017) [53]	USA	Descriptive	Case series	Program	Increase client access to a service	Sub-national	Treatment service + Mental and psychiatric service + Social service + Public Health and primary care	PWUD with co-occurring medical + mental health problems	Integration	Increase in service utilization by target clients
Morgenstern, *et al.* (2009) [54]	USA	Explanatory	Controlled trial	Research project	Increase client access to a service + Improve service coordination	Sub-national	Treatment service + Social service + Mental and psychiatric service	PWUD with co-occurring social problem	Cooperation and coordination	Increase in service utilization by target clients + Reduced drug use by target clients
Pelissier and Cadigan (2004) [55]	USA	Explanatory	Cohort	Program	Increase client access to a service + Improve service coordination	National	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Cooperation and coordination	Increase in service utilization by target clients
Proeschold-Bell, *et al.* (2010) [56]	USA	Explanatory	Quasi-experiment	Research project	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Integration	Reduced drug use by target clients

SOURCE	CHARACTERISTICS OF ARTICLES			FEATURES OF COLLABORATIVE INITIATIVES						
	Country of origin	Aim of the paper	Method used	Nature	Goal	Geographic scope	Participants	Target client	Level of partnership	Outcomes
Proeschold-Bell, *et al.* (2016) [57]	USA	Explanatory	Quasi-experiment	Research project	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Integration	Reduced drug use by target clients
Rosenheck, *et al.* (2003) [58]	USA	Explanatory	Survey	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Mental and psychiatric service	PWUD with co-occurring mental health + social problems	Integration	Not reported
Ryland and Lucas (1996) [59]	USA	Descriptive	Mixed method – Case study	Program	Develop new service + Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring mental health problem	Collaboration	Not reported
Samet, et al. (2003) [60]	USA	Explanatory	Controlled trial	Research project	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Cooperation and coordination	Increase in service utilization by target clients
Schlenger, et al. (1992) [61]	USA	Evaluative	Mixed method – Evaluation	Project demonstration	Increase client access to a service	National	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Integration	Increase in service utilization by target clients
Smith and Mogro-Wilson (2007) [62]	USA	Explanatory	Survey	Program	Not stated	Sub-national	Treatment service + Social service	PWUD with co-occurring social problem	Collaboration	
Van Hasselt, *et al.* (2005) [63]	USA	Descriptive	Mixed method – Case study	Program	Increase client access to a service	Sub-national	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Collaboration	Reduced drug use + Reduced reoffending by target clients
Veysey, *et al.* (2004) [64]	USA	Descriptive	Mixed method – Case study	Project demonstration	Develop new service + Increase client access to a service	Sub-national	Treatment service + Social service + Mental and psychiatric service	PWUD with co-occurring mental health + social problems	Integration	Not reported
Watkins, *et al.* (2017) [65]	USA	Explanatory	Controlled trial	Research project	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with no co-occurring disorder	Integration	Reduced drug use by target clients
Welsh, *et al.* (2016) [66]	USA	Explanatory	Controlled trial	Research project	Increase client access to a service	Sub-national	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Collaboration	Not reported
Wenzel, *et al.* (2004) [67]	USA	Descriptive	Qualitative	Program	Increase client access to a service	Sub-national	Treatment service + Criminal justice service	PWUD with co-occurring social problem	Cooperation and coordination	Not reported
Whiters, *et al.* (2010) [68]	USA	Descriptive	Mixed method – Case study	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Faith-based organization	PWUD with co-occurring medical + mental health problems	Collaboration	Increase in service utilization by target clients
Wood and Austin (2009) [69]	USA	Descriptive	Mixed method – Case study	Project demonstration	Increase client access to a service	Sub-national	Treatment service + Public Health and primary care	PWUD with co-occurring medical problem	Collaboration	Not reported
Zaller, *et al.* (2007) [70]	USA	Descriptive	Quasi-experiment	Project demonstration	Increase client access to a service + Improve service coordination	Sub-national	Treatment service + Social service + Mental and psychiatric service	PWUD with co-occurring medical + mental health problems	Integration	Increase in service utilization by target clients