

## Forty-eight years of research on psychosocial interventions in the treatment of opioid use disorder: A scoping review

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### ABSTRACT

**Background:** Mapped the sources and types of evidence available on psychosocial interventions in the treatment of opioid use disorder (OUD), with and without pharmacotherapies.

**Methods:** Six electronic databases were searched for research published until July 1, 2019. Included studies were coded on publication characteristics, evidence sources, treatment settings and modalities, study populations and patient characteristics, intervention(s) offered to patients, research questions addressed in experimental studies, and outcomes investigated.

**Results:** We identified 305 empirical studies of 54,607 patients. Most studies (64 %;  $n = 194$ ) compared psychosocial interventions to alternative treatment(s) (183 RCTs and 11 quasi-experiments) while 28 % ( $n = 86$ ) used observational designs, and 8% ( $n = 25$ ) used qualitative methods. Trials infrequently investigated effects of stand-alone psychosocial interventions without pharmacotherapies (20% of all RCTs). Regardless of research question or study design, program retention and illicit drug use were the most common outcomes investigated (> 81% of all studies and RCTs), typically among longstanding male heroin users attending specialty outpatient addiction services. Studies rarely examined (a) OUD treatment in general health care or prescription OUD (each < 6 % of all studies and RCTs), (b) effects of social assistance (employment, education, social support) and harm reduction (each < 6 % of studies; < 7 % of RCTs), and (c) health-related quality of life and satisfaction with care (each < 10 % and < 15 % of all studies and RCTs, respectively).

**Conclusions:** Scant evidence is available on the putative rehabilitative effects of psychosocial interventions, either as stand-alone treatments or in an adjunct role to pharmacotherapies.

### 1. Introduction

*“Methadone and other medications can be produced in large quantity, but the compassion and skillful counseling needed for rehabilitation ... are not replicated in the climate of bureaucracy” (Dole and Nyswander, 1976, p. 2119).*

Today, over 40 years after Dole and Nyswander reflected on their seminal work documenting the effectiveness of methadone maintenance, the role of psychosocial interventions in the treatment of opioid use disorders (OUD) is equivocal (Day and Mitcheson, 2017). A 2011 Cochrane Review of 35 randomized controlled trials (RCTs) concluded there was high-quality evidence that adding psychosocial interventions

to opioid agonist treatment (OAT) does not improve program retention or abstinence from illicit substances, and moderate-quality evidence that adjunct psychosocial treatments do not improve patient outcomes relative to OAT with standard medical management (Amato et al., 2011). A 2016 systematic review found that despite some evidence for the efficacy of providing psychosocial interventions in combination with medications, a general conclusion regarding the incremental benefit of adding psychosocial interventions to pharmacotherapies was not possible, due to heterogeneous study designs, outcomes, pharmacotherapies, and interventions (Dugosh et al., 2016). These reviews problematize Dole and Nyswander's endorsement of “skillful counseling” as a rehabilitative component of OUD treatment. Nonetheless, clinical practice guidelines advise that in addition to

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pharmacotherapies, services should routinely offer psychosocial interventions (e.g., [Bruneau et al., 2018; Kleber, 2007]). This disconnection between clinical practice guidelines and results from the trial literature raises fundamental questions about the role of psychosocial interventions in OUD treatment (Flynn, 2017; Raistrick, 2017; Selin, 2017; Strike and Guta, 2017).

### 1.1. Rationale

Results obtained from systematic reviews (ideally, with meta-analyses) have become the *de facto* standard to inform clinical practice in evidence-based medicine, as they synthesize results from studies addressing precise research questions about the efficacy or effectiveness of specific interventions. However, the premise of this paper is that this topic would benefit from a *scoping review* – a distinct review approach designed to comprehensively assesses the nature of available evidence, rather than produce a pooled effect estimate across trials examining a specific intervention (Grant and Booth, 2009; Tricco et al., 2018). Four arguments support this rationale. First, by design, systematic reviews focus on narrowly defined research questions. For example, both the Amato et al. (2011) and Dugosh et al. (2016) reviews examined whether adding psychosocial interventions to medications improves patient outcomes compared to stand-alone pharmacotherapies with standard medical management. However, other plausible research questions could be posed (e.g., efficacy of stand-alone psychosocial interventions versus pharmacotherapies), and scoping reviews are helpful for taking stock of the diversity and relative priority of questions posed in a research area. Second, systematic reviews assemble evidence on efficacy or effectiveness for specific interventions (e.g., contingency management; see Davis et al., 2016; McPherson et al., 2018). But a wide variety of psychosocial interventions for OUD have been investigated, and a scoping review is well-suited for documenting the breadth of intervention approaches used in an area (Peters et al., 2017). Third, systematic reviews typically exclude evidence from quasi-experiments, observational studies, and qualitative studies on grounds that these are inferior study designs for addressing questions of intervention efficacy and/or effectiveness. However, there is growing awareness that this assumption may be too restrictive to synthesize the varied evidence sources needed to inform clinical practices across diverse service contexts and populations, and in relation to factors affecting uptake and spread of effective treatments into routine patient care (Clarke et al., 2013; Concato et al., 2000; Maher and Neale, 2019; Tucker and Roth, 2006). A key objective of a scoping review is to describe the kinds of evidence available to inform practice in a research area (Peters et al., 2017). Finally, while extant reviews have emphasized meta-analyses of treatment retention and abstinence outcomes, a comprehensive description of all end-points investigated in relation to psychosocial interventions in OUD treatment (e.g., the extent to which this field has investigated changes in health-related quality of life, risk behaviours, criminality, educational attainment, etc.) is not currently available to our knowledge. A scoping review describing the range of patient outcomes that have been investigated could assist in identifying knowledge gaps (cf. Alves et al., 2017). Collectively, these arguments, combined with the reality that many abstinence-oriented addiction treatment services offer psychosocial interventions for OUD *without* providing pharmacotherapies, suggested that a scoping review on this topic would be useful.

### 1.2. Aim and objective

To our knowledge, only one previous systematic review has examined stand-alone psychosocial interventions in OUD treatment (Mayet et al., 2004). That review included five RCTs, each evaluating a different psychosocial intervention. Results indicated that enhanced outreach counseling and reinforcement-based outpatient treatment incrementally improved patient outcomes relative to non-psychosocial interventions (pharmacotherapy, placebo, or no intervention). However, trial sample

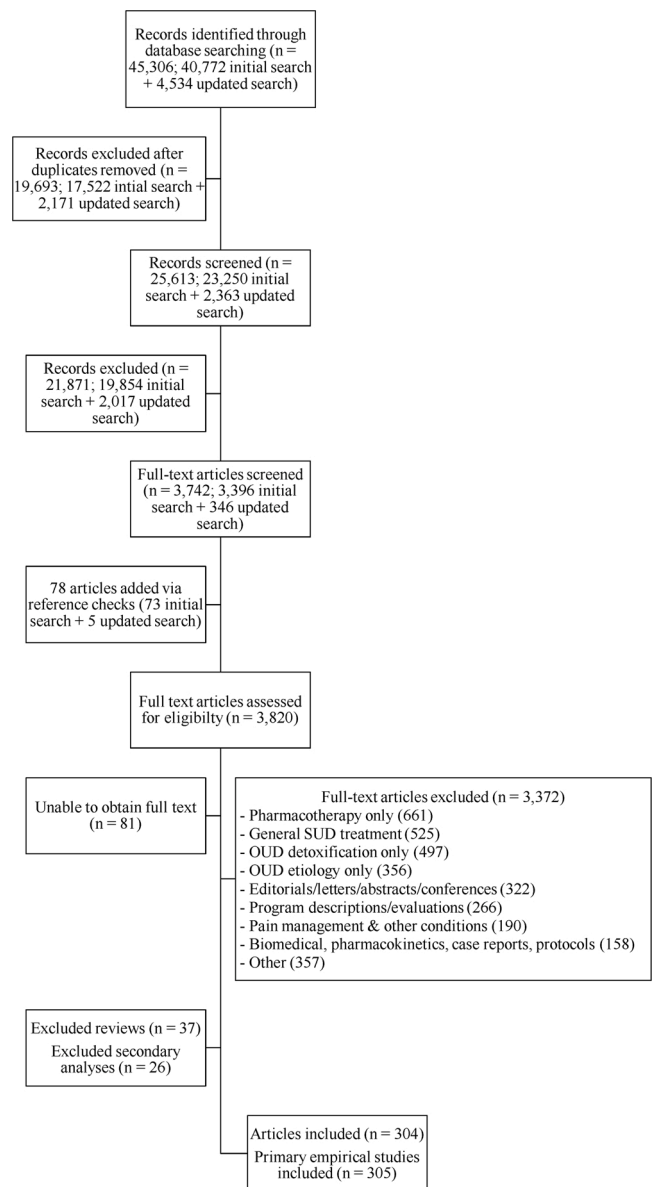


Fig. 1. Overview of search process.

sizes were small and meta-analytic results were unavailable due to the heterogeneity of psychosocial interventions included in the review. The authors concluded that there was insufficient evidence that stand-alone psychosocial treatments are effective treatment modalities. Because Mayet et al. (2004) considered studies published only through 2002 and excluded evidence other than that provided by RCTs, the present paper updates that review and more comprehensively describes evidence sources relevant to the use of psychosocial interventions in OUD treatment. Thus, our aim was to conduct a scoping review to describe the state of evidence on psychosocial interventions in OUD treatment, with or without pharmacotherapies. Unlike systematic reviews with meta-analyses, scoping reviews attempt “to map rapidly the key concepts underpinning a research area, and the main sources and types of evidence available” (Mays et al., 2001) using “data from any type of evidence and research methodology,...not restricted to quantitative studies (or any other study design) alone” (Peters et al., 2017, p. 8). Our objective was to identify and describe all primary empirical studies that have investigated psychosocial interventions in OUD treatment, with or without pharmacotherapies, including RCTs, quasi-experiments, observational research, and qualitative studies. In particular, we sought to

**Table 1**  
Article inclusion and exclusion criteria.

Articles included if they...	Articles excluded if they...
Reported results of research on human samples or populations seeking treatment for OUD, and	Investigated or reviewed treatment of comorbid medical conditions unrelated to OUD (e.g., diabetes, obesity, cancer, etc.), and/or
Reviewed or presented quantitative and/or qualitative results of primary studies investigating structured, time-limited, non-pharmacologic interventions <sup>a</sup> in the treatment of OUD, with or without the use of pharmacologic treatments (e.g., methadone and/or buprenorphine), or	Investigated or reviewed research on the impact of pharmacologic or psychosocial interventions on neonates with OUD (research on treatment of pregnant substance users was potentially eligible for inclusion, however), and/or
Investigated psychosocial treatment or prevention of comorbid conditions that influence outcomes of OUD treatment (e.g., non-pharmacologic interventions to address mental disorders or physical conditions directly related to OUD, such as HIV, Hepatitis), or	Investigated or reviewed research on the use of opioids solely in the context of pain management, and/or
Investigated or reviewed quantitative and/or qualitative results of research on housing, employment, or other social supports in the context of OUD treatment, or	Investigated or reviewed research on biomedical aspects or correlates of OUD treatment (e.g., brain imaging), including pharmacokinetic studies (drug interactions, dosage testing), or reported only physiologic and/or biochemical variables, and/or
Reported quantitative and/or qualitative results of research investigating treatment of symptoms of OUD in any way, including with conventional drugs (such as clonidine to treat hypertension in withdrawal, etc.), and	Reported clinical practice guidelines or local (grey literature) program evaluations, and/or
	or
	<ul style="list-style-type: none"> <li>• Investigated or reviewed OUD outside the context of treatment, and/or</li> <li>• Investigated or reviewed research on measurement/assessment tool validation, and/or</li> <li>• Provided commentary, responses, editorials, letters to the editor, or were dissertations, and/or</li> <li>• Reported conference abstracts, conference proceedings, and/or</li> <li>• Reported study protocols only, and/or</li> <li>• Were not published in the English language, and/or</li> <li>• Investigated or reviewed research on OUD in non-human species</li> </ul>
Were English-language articles published by July 1, 2019	

Note. <sup>a</sup> Additional file 1 provides a list of interventions considered eligible for the review in relation to the controlled search vocabularies developed for each database.

provide perspective on the state of evidence on this topic and insights into knowledge gaps and future research directions.

## 2. Material and methods

### 2.1. Protocol

Our review protocol was developed *a priori*, using established scoping review methods (Arksey and O'Malley, 2005; The Joanna Briggs Institute, 2011). Consistent with those guidelines, we did not assess quality of included studies. However, the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR; Tricco et al., 2018) informed the reporting of our results.

### 2.2. Information sources

The search strategy was developed iteratively with the assistance of a professional health research librarian. Multiple test searches were conducted using an *a priori* list of keywords and subject headings to develop and refine database-specific controlled vocabularies in five databases: Ovid MEDLINE, EMBASE, CINAHL, Cochrane Library, and PsycINFO (Additional File 1). English-language articles published up to July 1, 2017 were eligible for inclusion in an initial search of these databases. This process identified 40,772 records, of which 17,522 duplicates were removed, leaving 23,250 unique records that were screened for relevance. An updated search was performed to identify additional records published from July 1, 2017 – July 1, 2019. This search identified 4534 records, of which 2171 duplicates were removed, leaving 2363 records that were screened for relevance (Fig. 1).

### 2.3. Selection of evidence sources

A two-phased screening process was used to screen the records recovered in the initial search. Two assistants independently screened titles and abstracts of the 23,250 records using provisional inclusion and exclusion criteria. Interrater reliability was assessed using Cohen's Kappa coefficient and Gwent's AC1 coefficient (Feng, 2014). Values exceeding 0.80 on both coefficients were regarded as acceptable. Screeners co-reviewed consecutive batches of 100 records until acceptable interrater agreement was reached. Disagreements were discussed with the study team and the inclusion and exclusion criteria were

refined and clarified, as necessary. Using the final inclusion/exclusion criteria (Table 1), screening then proceeded independently between research assistants. Randomly-drawn batches of 100 records were jointly screened periodically to verify that acceptable interrater agreement was maintained. A total of 3396 full-text articles were reviewed in a second screening phase for eligibility. This process was supplemented by a hand search of reference lists of published review articles, which identified 73 additional articles, yielding a total of 3469 that were screened for eligibility. The same procedures were used for screening the updated search results, which identified 346 additional full-text articles that were screened for eligibility. An additional 5 articles were identified through reference checks. In total, the initial and updated search and screening process yielded 367 articles reporting the results from 368 studies. Because the purpose of this scoping review was to take stock of the primary empirical literature, we removed 37 reviews and 26 studies reporting secondary analyses (those results will be reported elsewhere), leaving 304 articles reporting results of 305 primary empirical studies. Fig. 1 describes the search strategy, using the PRISMA reporting guidelines (Moher et al., 2009).

### 2.4. Data charting process

Empirical studies were coded on 128 variables grouped in 7 domains, as applicable: (1) publication characteristics, (2) evidence sources, (3) treatment settings and modalities investigated, (4) study populations and patient characteristics reported, (5) types of intervention(s) investigated, (6) research questions posed in experimental studies, and (7) patient outcomes assessed. The coding manual (Additional File 2) was developed iteratively based on knowledge of the literature and results from initial data extraction, and was used by five members of the review team. Coders initially completed 25 randomly sampled articles and disagreement was resolved by discussion with study investigators. A randomly drawn subsample of 106 (29.0 %) articles was double-extracted to assess inter-coder reliability, which was good (Cohen's Kappa and Gwent's AC1 both > 0.80). Minor disagreements were resolved through discussion.

### 2.5. Data items

#### 2.5.1. Publication characteristics

We extracted author(s), publication year, and origin of the article

(USA, Canada, Europe, Australia, Latin America, Africa, Middle East, Asia).

### 2.5.2. Evidence sources

Included articles were classified as *reviews*, *empirical studies*, or *economic studies*, with additional coding to classify study designs within these categories. Empirical studies were coded into two types of *experimental studies* (RCTs, quasi-experiments), three types of *observational studies* (cross-sectional, retrospective cohorts, prospective cohorts), and *qualitative studies*.

### 2.5.3. Treatment settings and modalities

Settings for the delivery of psychosocial interventions were coded as either *general health care* settings (i.e., OUD treatment offered in a general health care facility that provides different medical and health services), *specialty addiction care* (i.e., a facility providing specialized addiction services and programs), or *corrections* (NIDA, 2020). Within general health care, three sub codes identified *primary care settings* (i.e., OUD treatment provided in any outpatient setting providing everyday health services, usually the first point of contact with a health professional), *acute care settings* (i.e., treatment provided in emergency departments and/or urgent care), and *inpatient settings* (i.e., treatment provided following admission to a hospital ward for an extended time, but not in a specialized addiction treatment program or facility). Within *specialty addiction care*, two sub codes identified *outpatient settings* (i.e., patients visit for OAT and/or other services and leave the facility or program within hours) and *residential/inpatient settings* (i.e., treatment provided after admission to a residential or inpatient facility dedicated solely to specialty addiction treatment). Treatment modalities were coded into three categories: *group* psychosocial treatment, *individual* psychosocial treatment, and *family/couples* treatment (CSAT, 2013).

### 2.5.4. Study populations and patient characteristics

Study populations included *general adult populations* seeking treatment for OUD, *special populations* (e.g., veterans, prisoners, legally-mandated patients, pregnant women, youth, patients with comorbid alcohol use disorders, homeless patients, or patients with HIV), or *multiple populations* (i.e., general adult and one or more special populations, and/or articles that included health care professionals or members of patients' families as participants in addition to patients). We extracted *sample sizes* reported in empirical studies, along with *sex* (% of males and females), *age* (M, SD, range), *duration of opioid use* (years), *type(s) of opioids used* (heroin, prescription opioids, multiple, unspecified), and whether data on *other substance use* (alcohol, cocaine, stimulants, sedatives, cannabis, nicotine, other), and *comorbid mental disorders* were collected. Finally, we also extracted, as applicable, which *pharmacotherapies* were provided to patients (methadone, buprenorphine, buprenorphine + naloxone, naltrexone, multiple/other, unclear, none).

### 2.5.5. Interventions

All psychosocial interventions were provided for a limited time (i.e., within the study period) regardless of whether or not pharmacotherapies were provided. Duration of psychosocial treatment reported in each study was recorded in *months*, and an additional code described whether or not these interventions were reported as being *manualized*. Eligible psychosocial interventions (Additional File 3) were aggregated into 7 categories: (1) *psychological interventions* (i.e., counselling [generic or unspecified], contingency management, cognitive behavioral therapy, group therapy, psychoeducation, cue exposure therapy, motivational interviewing, 12-step facilitation, family therapy, hypnosis, relapse prevention); (2) *addiction sector interventions* (i.e., recovery management, therapeutic communities, faith-based programs); (3) *system management interventions* (i.e., case management interventions, technology delivered programs, node-link mapping); (4) *social assistance interventions* (i.e., employment, school completion, and/or social support interventions), (5) *harm reduction interventions* (i.e., needle

exchange/distribution, HIV prevention education); (6) *other non-pharmacologic interventions* (i.e., transcutaneous nerve stimulation, acupuncture, alternative interventions); and (7) *multiple interventions*, i.e., combinations of the treatments and interventions listed in 1–6 above.

### 2.5.6. Research questions posed in experimental (RCT, quasi-experimental) studies

Five experimental designs were coded, each addressing specific research questions comparing psychosocial interventions to some alternative treatment(s) (Table 2). Designs 1–3 addressed the effects of stand-alone psychosocial interventions, while Designs 4 and 5 examined the adjunct role of psychosocial interventions in relation to pharmacotherapies.

### 2.5.7. Outcomes

Eleven patient outcomes were extracted, including: *drug (illicit opioid) use* (self-reported, biologically verified, not verified, or unclear); *treatment retention*; *mental health symptoms/disorders*; *employment*; *criminality*; *risk behaviours* (i.e., behaviours related to illicit drug use and infectious disease transmission); *cravings/withdrawal-related affect/mood*; *satisfaction with treatment*; *health-related quality of life*; *transfer to other health services*; and *transfer to other psychosocial services*. In addition, we extracted 2 study outcomes, including whether or not *illicit drug use* was *verified* (yes, no, unclear; if yes, whether a biological measure was used for verification), and whether or not patient *attrition* was reported.

## 2.6. Summary of results

The SPICE framework (Booth, 2006) was used to map evidence produced from included studies. SPICE incorporates the commonly-used PICO constructs for structuring systematic reviews of treatment interventions (i.e., population, intervention, comparator, and outcome; Schardt et al., 2007), but is better-suited to scoping reviews because it provides a broader and more flexible framework for synthesizing evidence from a wider range of study designs and is inclusive of both quantitative and qualitative evidence (The Joanna Briggs Institute, 2011). SPICE refers to *settings* (i.e., what kinds of treatment programs provided evidence on psychosocial interventions?), *perspective* (for whom, i.e., what target populations and patient characteristics were investigated?), *intervention* (i.e., what kinds of psychosocial interventions were examined?), *comparison* (i.e., compared, if applicable, with what alternative intervention approaches?), and *evaluation* (i.e., using what kinds of outcome measures?). In order to include a more detailed synopsis of RCT evidence across the SPICE constructs by

**Table 2**

Study designs identified in experimental research (randomized controlled trials, quasi-experiments) of psychosocial interventions, 1971 – 2019.

Design	Description
1	<i>Psychosocial vs. psychosocial</i> . Stand-alone psychosocial intervention compared to one or more stand-alone psychosocial interventions. These studies investigated usual psychosocial care offered to one or more groups; comparison groups could include enhanced or alternative/experimental psychosocial interventions.
2	<i>Psychosocial vs. pharma</i> . Stand-alone psychosocial interventions compared to non-psychosocial interventions. These studies compared one or more psychosocial interventions to stand-alone pharmacotherapies.
3	<i>Psychosocial vs. psychosocial + pharma</i> . Stand-alone psychosocial interventions compared to a combination of psychosocial interventions and pharmacotherapy. These studies provided psychosocial interventions in all study arms.
4	<i>Pharma vs. psychosocial + pharma</i> . Stand-alone pharmacotherapies compared to a combination of pharmacotherapy and psychosocial interventions. These studies provided pharmacotherapies in all study arms.
5	<i>Adding different psychosocial to pharma</i> . Two or more psychosocial interventions compared in the context of pharmacotherapy. These studies provided pharmacotherapies in all study arms; each study arm added a different type of psychosocial intervention.

research question, results are reported in the following order: settings, perspective, interventions, outcomes, and comparisons.

### 3. Results

#### 3.1. Publication characteristics and evidence sources

We identified 305 empirical studies investigating 54,607 patients treated for OUD. About two-thirds (63.0 %) of included studies reported evidence originating in the United States, followed by Europe (13.7 %), Asian countries (8.9 %), the Middle East (6.6 %), Australia (5.8 %), and Canada (2.0 %). Most studies ( $n = 194$ ; 63.6 %) used experimental designs to compare psychosocial interventions to one or more alternative treatments (183 RCTs and 11 quasi-experiments), while 86 (28.2 %) used observational designs, and 25 (8.2 %) reported results from qualitative research (Fig. 2).

An analysis of evidence sources published in consecutive decades over the review period revealed that experimental research (RCTs, quasi-experiments) appeared most frequently across almost all decades (from 47.1 % of included studies in 1971–1980 to 64.8 % in 2011–2019). Observational studies (retrospective and prospective cohorts; cross-sectional studies) appeared most frequently in the first decade of the review period (1971–1980; 52.9 % of included studies); by 2011–2019 this had dropped to 22.4 % of all studies. Qualitative research first appeared in the 1991–2000 era (4.3 % of included studies), tripling by 2011–2019 (12.8 %).

#### 3.2. Settings

Evidence was collected primarily from services offering specialty addiction treatment for OUD (66.6 % overall; 67.2 % of RCTs; Table 3). Of studies conducted in specialty addiction care settings, most evidence was collected from outpatient programs (73.4 % and 80.5 % of all studies and RCTs conducted in this setting, respectively). In contrast, OUD treatment was rarely investigated in any general health care settings (i.e., primary, acute care and/or inpatient services; 5.6 % overall; 4.4 % of RCTs). Of the scant evidence produced in general health care settings, most was obtained in the context of primary care (76.5 % and 75 % of all studies and RCTs conducted in general health care, respectively). Treatment provided in correctional settings was also rarely examined (4.3 % overall; 4.4 % of RCTs). Observational research was the most common evidence source used to study psychosocial interventions delivered in general health services: 41.2 % of all studies conducted in general health care settings used observational methods. Psychosocial interventions targeting individual patients were most commonly investigated (45.2 % overall; 59.6 % of RCTs; Table 3), followed by combination treatments using several modalities (24.6 % overall; 21.3 % of

RCTs) and group treatments (11.1 % overall; 12.0 % of RCTs).

#### 3.3. Perspective

Adults comprised the vast majority of patients (81.6 % overall; 85.8 % of RCTs; Table 4). Special populations (i.e., youth, veterans, prisoners, court-mandated patients, opioid users experiencing homelessness, HIV, and/or comorbid alcohol use disorder) were infrequently studied (13.4 % overall; 12.0 % of RCTs). Median sample sizes were 85 for RCTs, 50 for quasi-experiments, 173 for prospective cohorts, 100 for retrospective cohorts, 42 for cross-sectional studies, and 22 for qualitative research. About half (48.9 %) of all included studies investigated patients receiving treatment for heroin use, and one-third (33.1 %) did not specify the type(s) of opioids used by patients. Patients seeking treatment for prescription OUD were rarely studied (3.0 % overall; 3.3 % of RCTs). Patient sex was consistently reported (95.4 % of empirical studies; 97.3 % of RCTs) and research was primarily conducted among men (69.1 % male across evidence sources; range = 65.6 %–71.9 %). Of the 265 (86.9 %) studies that reported age, average patient age was 34.8 years ( $SD = 6.2$ ); range = 27.4–37.2. Less than one-third ( $n = 97$ ; 31.8 %) of included studies reported duration of patients' opioid use (34.4 % among RCTs). Among the minority of studies that reported duration of opioid use, average duration was 10.6 years ( $SD = 4.5$ ; range = 7.5–16.1 years). Most empirical research (72.1 %) and RCTs (78.1 %) assessed substance use beyond opioids, but less than half (40.3 % overall; 48.6 % of RCTs) assessed comorbid mental disorders and considered this in design or analysis.

#### 3.4. Interventions

A total of 36 distinct psychosocial intervention approaches were investigated, averaging about 6 months of treatment across evidence sources (5.0 months for RCTs; Table 5). Cohort studies examined longer treatment durations (8.7 months and 13.5 months for prospective and retrospective cohort studies, respectively). Only about one-third (33.1 %) of studies reported the use of a manualized psychosocial intervention; evidence on manualized interventions was reported most frequently among experimental studies (44.8 % of RCTs; 36.4 % of quasi-experiments) and least frequently among prospective cohort studies (14.1 %) and qualitative research (16.0 %).

About half of all included studies ( $n = 140$ ; 45.9 %) and RCTs ( $n = 92$ ; 50.3 %) investigated one of 16 psychological therapies, of which contingency management was most commonly studied (35.0 % of studies investigating a psychological therapy overall; 21.9 % of RCTs investigating a psychological therapy), followed by cognitive-behavioural therapy (12.1 %), counseling (generic/unspecified; 9.3 %) and group therapy (8.6 %; Table 5). *Addiction treatment sector*

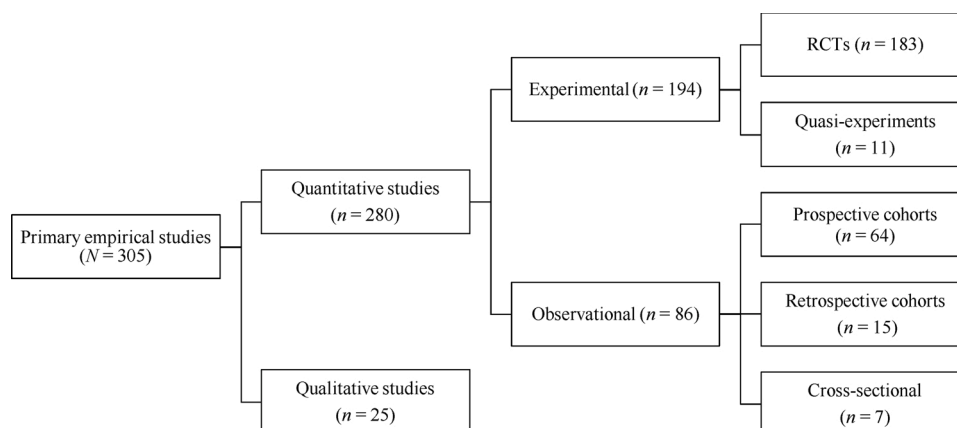


Fig. 2. Primary evidence sources and study designs, psychosocial interventions in the treatment of OUD, 1971 – 2019.

Table 3

Treatment settings and treatment modalities investigated in primary empirical research on psychosocial interventions in OUD treatment, 1971-2019.

	Experimental studies (n = 194)		Observational studies (n = 86)			Qualitative studies (n = 25)	All studies (N = 305)
	RCTs (n = 183)	QESs <sup>a</sup> (n = 11)	Prospective cohorts (n = 64)	Retrospective cohorts (n = 15)	Cross-sectional (n = 7)		
<b>Treatment settings, n(%)</b>							
<b>General health care</b>	<b>8 (4.4)</b>	<b>1 (9.1)</b>	<b>3 (4.7)</b>	<b>3 (20.0)</b>	–	<b>2 (8.0)</b>	<b>17 (5.6)</b>
Primary care <sup>b</sup>	6 (75.0)	1 (100.0)	1 (33.3)	3 (100.0)	–	2 (100.0)	13 (76.5)
Acute care	1 (12.5)	–	–	–	–	–	1 (5.9)
Inpatient	1 (12.5)	–	2 (66.7)	–	–	–	3 (17.7)
<b>Specialty addiction care</b>	<b>123 (67.2)</b>	<b>10 (90.9)</b>	<b>46 (71.9)</b>	<b>7 (46.7)</b>	<b>6 (85.7)</b>	<b>11 (44.0)</b>	<b>203 (66.6)</b>
Outpatient	99 (80.5)	8 (80.0)	26 (56.5)	3 (42.9)	4 (66.7)	9 (81.8)	149 (73.4)
Residential	11 (8.9)	–	6 (13.0)	–	2 (33.3)	2 (18.2)	21 (10.3)
Multiple	4 (3.3)	–	11 (23.9)	2 (28.6)	–	–	17 (8.4)
Unclear	9 (7.3)	2 (20.0)	3 (6.5)	2 (28.6)	–	–	16 (7.9)
<b>Research project site</b>	<b>21 (11.5)</b>	–	<b>3 (4.7)</b>	<b>1 (6.7)</b>	–	–	<b>25 (8.2)</b>
<b>Corrections</b>	<b>8 (4.4)</b>	–	<b>3 (4.7)</b>	<b>1 (6.7)</b>	–	<b>1 (4.0)</b>	<b>13 (4.3)</b>
Multiple	1 (0.5)	–	4 (6.3)	3 (20.0)	–	–	2 (8.0)
Other	5 (2.7)	–	2 (3.1)	–	–	5 (20.0)	10 (3.3)
Unclear	17 (9.3)	–	3 (4.7)	–	1 (14.3)	4 (16.0)	25 (8.2)
<b>Treatment modalities, n (%)</b>							
Individual	109 (59.6)	5 (45.5)	15 (23.4)	1 (6.7)	3 (42.9)	5 (20.0)	138 (45.2)
Group	22 (12.)	–	2 (3.1)	4 (26.7)	–	6 (24.0)	34 (11.1)
Family and/or couples	5 (2.7)	1 (9.1)	1 (1.6)	–	1 (14.3)	–	8 (2.6)
Combination	39 (21.3)	2 (18.2)	24 (37.5)	3 (20.0)	1 (14.3)	6 (24.0)	75 (24.6)
Unclear	8 (4.4)	3 (27.3)	22 (34.4)	7 (46.7)	2 (28.6)	8 (32.0)	50 (16.4)

Notes. <sup>a</sup> Quasi-experimental studies. <sup>b</sup> Subcategory percentages calculated within evidence sources.

Table 4

Study populations and patient characteristics reported in primary empirical research on psychosocial interventions in OUD treatment, 1971-2019.

	Experimental studies (n = 194)		Observational studies (n = 86)			Qualitative studies (n = 25)	All studies (N = 305)
	RCTs (n = 183)	QESs <sup>a</sup> (n = 11)	Prospective cohorts (n = 64)	Retrospective cohorts (n = 15)	Cross-sectional (n = 7)		
<b>Target populations, n (%)</b>							
Adults	157 (85.8)	9 (81.8)	52 (81.3)	11 (73.3)	5 (71.4)	15 (60.0)	249 (81.6)
Special <sup>b</sup>	22 (12.0)	2 (18.2)	7 (10.9)	4 (26.7)	1 (14.3)	5 (20.0)	41 (13.4)
Multiple <sup>c</sup>	4 (2.2)	–	5 (7.8)	–	1 (14.3)	5 (20.0)	15 (4.9)
<b>Patient characteristics, n (%)</b>							
Sample size, <i>Mdn</i> ( <i>IQR</i> )	85 (92)	50 (35)	173 (260)	100 (182)	42 (153)	22 (19)	81 (127)
Gender reported? n (% yes)	178 (97.3)	11 (100)	61 (95.3)	14 (93.3)	5 (71.4)	22 (88.0)	291 (95.4)
% Male	69.0	71.4	70.3	67.3	71.9	65.6	69.1
Age reported? n (% yes)	164 (89.6)	10 (90.9)	57 (89.1)	15 (100)	4 (57.1)	15 (60.0)	265 (86.9)
Age, <i>M</i> ( <i>SD</i> )	36.2 (5.4)	30.5 (6.1)	32.3 (6.0)	31.7 (7.1)	27.4 (6.5)	37.2 (8.5)	34.8 (6.2)
Years opioids used reported? n (% yes)	63 (34.4)	3 (27.3)	20 (31.3)	5 (33.3)	1 (14.3)	5 (20.0)	97 (31.8)
Years opioids used, <i>M</i> ( <i>SD</i> )	11.0 (4.1)	8.0 (6.0)	8.7 (3.7)	9.3 (4.5)	7.5	16.1 (6.6)	10.6 (4.5)
<b>Type(s) of opioids used, n(%)</b>							
Heroin	83 (45.4)	6 (54.5)	37 (57.8)	4 (26.7)	3 (42.9)	16 (64.0)	149 (48.9)
Unspecified	62 (33.9)	4 (36.4)	18 (28.1)	6 (40.0)	3 (42.9)	8 (32.0)	101 (33.1)
Multiple	28 (15.3)	1 (9.1)	8 (12.5)	4 (26.7)	–	1 (4.0)	42 (13.8)
Prescription	6 (3.3)	–	1 (1.6)	1 (6.7)	1 (14.3)	–	9 (3.0)
Opium	4 (2.2)	–	–	–	–	–	4 (1.3)
Other substance use assessed, n (% yes)	143 (78.1)	7 (63.6)	46 (71.9)	11 (73.3)	4 (57.1)	9 (36.0)	220 (72.1)
<b>Comorbid mental disorder(s) assessed, n(%)</b>							
No	75 (41.0)	8 (72.7)	27 (42.2)	6 (40.0)	4 (57.1)	20 (80.0)	140 (45.9)
Yes, studied	89 (48.6)	3 (27.3)	22 (34.4)	6 (40.0)	1 (14.3)	2 (8.0)	123 (40.3)
Yes, excluded <sup>d</sup>	15 (8.2)	–	12 (18.8)	–	1 (14.3)	1 (4.0)	29 (9.5)
Unclear	4 (2.2)	–	3 (4.7)	3 (20.0)	1 (14.3)	2 (8.0)	13 (4.3)
<b>Pharmacotherapies used, n (%)</b>							
Methadone	97 (53.0)	6 (54.5)	28 (43.8)	6 (40.0)	2 (28.6)	8 (32.0)	147 (48.2)
Buprenorphine	17 (9.3)	1 (9.1)	3 (4.7)	1 (6.7)	–	2 (8.0)	24 (7.9)
Buprenorphine + Naloxone	10 (5.5)	–	2 (3.1)	1 (6.7)	–	2 (8.0)	15 (4.9)
Naltrexone	15 (8.2)	–	4 (6.3)	1 (6.7)	1 (14.3)	–	21 (6.9)
Multiple/other	15 (8.2)	2 (18.2)	11 (17.2)	4 (26.7)	2 (28.6)	1 (4.0)	35 (11.5)
Unclear	3 (1.6)	1 (9.1)	–	–	–	12 (48.0)	16 (5.2)
None	26 (14.2)	1 (9.1)	16 (25.0)	2 (13.3)	2 (28.6)	–	47 (15.4)

Note. <sup>a</sup> Quasi-experimental studies. <sup>b</sup> Treatment offered only to veterans, prisoners, patients with other legal involvement, pregnant women, youth, patients with comorbid alcohol use disorders, homeless patients, or patients with HIV. <sup>c</sup> Treatment offered to adults and one or more special populations, and/or articles that included health care providers or members of patients' families as participants in addition to patients seeking treatment for OUD. <sup>d</sup> Patients with comorbid mental disorders considered ineligible.

**Table 5**  
Types of psychosocial interventions investigated in primary empirical research on OUD treatment, 1971-2019.

	Experimental studies (n = 194)		Observational studies (n = 86)				n, % within type of psychosocial intervention	% of all studies (N = 305)
	RCTs (n = 183)	QESs* (n = 11)	Prospective cohorts (n = 64)	Retrospective cohorts (n = 15)	Cross- sectional (n = 7)	Qualitative studies (n = 25)		
<b>Months of Treatment, M(SD)</b>	5.0 (4.1)	4.3 (5.1)	8.7(7.7)	13.5 (7.5)	2.8 (2.6)	n/a	n/a	5.7 (5.2)
<b>Intervention manualized?n(%)</b>	82 (44.8)	4 (36.4)	9 (14.1)	–	2 (28.6)	4 (16.0)	n/a	(33.1)
<b>Psychological interventions, n (%)</b>	92 (50.3)	7 (63.6)	23 (35.9)	9 (60.0)	3(42.9)	6(24.0)	140(100)	45.9
Contingency management (CM)	40 (21.9)	–	6 (9.4)	1 (6.7)	1 (14.3)	1 (4.0)	49 (35.0)	16.1
Cognitive behavioural therapy (CBT)	15 (8.2)	–	–	1 (6.7)	1 (14.3)	17 (12.1)	5.6	
Counselling (generic/ unspecified)	9 (4.9)	–	3 (4.7)	–	–	1 (4.0)	13 (9.3)	4.3
Group therapy	4 (2.2)	–	3 (4.7)	4 (26.7)	–	1 (4.0)	12 (8.6)	3.9
Motivational interviewing (MI)	5 (2.7)	2 (18.2)	1 (1.6)	1 (6.7)	–	2 (8.0)	11 (7.9)	3.6
Behavioral therapy	5 (2.7)	2 (18.2)	–	–	–	–	7 (5.0)	2.3
Family therapy	1 (0.5)	2 (18.2)	2 (3.1)	1 (6.7)	–	1 (4.0)	7 (5.0)	2.3
Relapse prevention	4 (2.2)	–	2 (3.1)	–	–	–	6 (4.3)	2.0
Psychoeducation	2 (1.1)	1 (9.1)	2 (3.1)	–	1 (14.3)	–	6 (4.3)	2.0
Cue exposure therapy	2 (1.1)	–	2 (3.1)	–	–	–	4 (2.9)	1.3
Community reinforcement approach (CRA)	1 (0.5)	–	1 (1.6)	1 (6.7)	–	–	3 (2.1)	1.0
Reinforcement-based therapy (RBT)	3 (1.6)	–	–	–	–	–	3 (2.1)	1.0
12 step facilitation treatment	–	–	1 (1.6)	–	–	–	1 (0.7)	0.3
Hypnosis	1 (0.5)	–	–	–	–	–	1 (0.7)	0.3
<b>Addiction sector interventions, n(%)</b>	11(6.0)	1 (9.1)	13 (20.3)	3 (20.0)	–	7 (28.0)	35(100)	11.5
Therapeutic community	2 (1.1)	1 (9.1)	7 (10.9)	2 (13.3)	–	2 (8.0)	14 (40.0)	4.6
Faith-based program	2 (1.1)	–	3 (4.7)	–	–	3 (12.0)	8 (22.9)	2.6
12 step approach/philosophy	–	–	2 (3.1)	–	–	2 (8.0)	4 (11.4)	1.3
Recovery management	4 (2.2)	–	–	–	–	–	4 (11.4)	1.3
Integrated comprehensive program	2 (1.1)	–	1 (1.6)	1 (6.7)	–	–	4 (11.4)	1.3
Intensive outpatient program	1 (0.5)	–	–	–	–	–	1 (2.9)	0.3
<b>System management interventions, n(%)</b>	15 (8.2)	–	3 (4.7)	–	1(14.3)	1 (4.0)	20 (100)	6.6
Technology delivered program	7 (3.8)	–	2 (3.1)	–	–	1 (4.0)	10 (45.5)	3.3
Case management	6 (3.3)	–	1 (1.6)	–	1 (14.3)	–	8 (36.4)	2.6
Node-link mapping	2 (1.1)	–	–	–	–	–	2 (9.5)	0.7
<b>Social assistance interventions, n(%)</b>	12 (6.6)	–	2 (3.1)	–	–	3 (12.0)	17 (100)	5.6
Employment program	5 (2.7)	–	1 (1.6)	–	–	1 (4.0)	7 (41.2)	2.3
Education program	5 (2.7)	–	–	–	–	1 (4.0)	6 (35.3)	2.0
Social support	2 (1.1)	–	1 (1.6)	–	–	1 (4.0)	4 (23.5)	1.3
<b>Harm reduction interventions, n (%)</b>	2 (1.1)	–	3 (4.7)	2 (13.3)	–	2 (8.0)	9 (100)	3.0
Harm reduction program	2 (1.1)	–	3 (4.7)	2 (13.3)	–	2 (8.0)	9 (100)	3.0
<b>Other interventions, n(%)</b>	16 (8.7)	2 (18.2)	4 (6.3)	1 (6.7)	1 (14.3)	1 (4.0)	25 (100)	8.2
Acupuncture	4 (2.2)	1 (9.1)	2 (3.1)	–	–	–	7 (28.0)	2.3
MBGT <sup>a</sup> & yoga	4 (2.2)	–	1 (1.6)	–	–	–	5 (20.0)	1.6
Biofeedback	1 (0.5)	1 (9.1)	–	–	1 (14.3)	–	3 (12.0)	1.0
Transcutaneous electrical nerve stimulation	2 (1.1)	–	–	–	–	–	2 (8.0)	0.7
Counselor and patient relationship	–	–	–	1 (6.7)	–	–	1 (4.0)	0.3
Other <sup>b</sup>	5 (2.7)	–	1 (1.6)	–	–	1 (4.0)	7 (28.0)	2.3
<b>Multiple psychosocial interventions, n(%)</b>	35 (19.1)	1 (9.1)	16 (25.0)	–	2 (28.6)	5(12.0)	59(100)	19.3
Multiple	19 (10.4)	1 (9.1)	16 (25.0)	–	2 (28.6)	4 (16.0)	42 (71.2)	13.8
Multiple with CM	16 (8.7)	–	–	–	–	1 (4.0)	17 (28.8)	5.6

Note. <sup>a</sup>MBGT: Mindfulness-Based Group Therapy; <sup>b</sup>Other interventions included: abstinence-oriented vs. indefinite maintenance goals, HereToHelp telephone support, subliminal stimulation, exercise, traditional medicine, self-detox, compulsory vs. voluntary treatment.

interventions were infrequently investigated (11.5 % overall; 6.0 % of RCTs); of those studies, 40.0 % investigated the therapeutic community approach and 22.9 % studied faith-based programs. System management interventions only appeared in 6.6 % of the empirical literature, and 45.5 % of those studies examined technology-assisted programs, followed by case management interventions (36.4 % of system management approaches). Psychosocial interventions providing patients with *social assistance* (employment, education social support) were rarely studied (5.6 % overall; 6.6 % of RCTs), as were *harm reduction* services (3.0 % overall; 1.1 % of RCTs). A small number of studies ( $n = 25$ ; 8.2 %) examined diverse non-pharmacologic approaches including acupuncture, yoga/mindfulness-based therapy, and biofeedback; 28.0 %, 20.0 % and 12.0 % of other psychosocial interventions, respectively).

### 3.5. Evaluation

Among the subset of 280 empirical studies reporting outcomes of psychosocial interventions, in-program illicit opioid use and treatment retention were most commonly investigated (83.6 % and 81.8 % overall, respectively; Table 6). Mental health symptoms were evaluated in just over one-third of studies (42.9 %), followed by criminality, employment, and craving and/or withdrawal-related mood (27.5 %, 25.4 %, and 16.8 % respectively). The least commonly evaluated outcomes in this literature were satisfaction with OUD treatment outcomes (14.6 %), risk behaviours (e.g., HIV/HCV-related and/or sexual behaviours; 14.3 %), transfer to other (medical) health services (11.1 %), health-related quality of life (9.6 %) and transfer to other psychosocial services (6.8 %). This rank-ordered pattern was largely replicated among the RCTs, considered as a single evidence source (Table 6). Most studies verified

in-program illicit drug use using biological methods (66.1 % overall; 73.2 % of RCTs). About one-third of studies reported patient attrition (36.1 % overall; 36.1 % of RCTs).

### 3.6. Comparisons: RCT evidence produced in different study designs

Study designs used among the 183 RCTs were classified (Table 2) and results indicated that only 37 (20.2 %) of trials investigated stand-alone psychosocial interventions (Table 7). These included 26 trials that compared different psychosocial interventions without providing medications (i.e., Design 1; 14.2 % of RCTs), 5 head-to-head comparisons of stand-alone psychosocial interventions to pharmacotherapies (i.e., Design 2; 2.7 % of RCTs) and 6 trials comparing psychosocial interventions to a combination of pharmacotherapy and psychosocial treatment (i.e., Design 3; 3.3 % of RCTs). Most trials ( $n = 146$ ; 79.2 %) provided pharmacotherapies in all study arms. Of them, a minority of trials ( $n = 40$ ; 21.9 %) directly addressed the question of whether psychosocial interventions incrementally improve patient outcomes relative to stand-alone medications (i.e., Design 4). Instead, most trials ( $n = 106$ ; 57.9 %) investigated pharmacotherapies in conjunction with different combinations of psychosocial interventions (Design 5). Less than half of all RCTs (44.8 % overall; range = 16.7 % [Design 3] – 48.1 % [Design 5]) indicated that they used manualized psychosocial interventions.

Although the RCTs addressed five distinct research questions involving the role of psychosocial interventions as either stand-alone or adjunct treatments, the settings, populations, interventions, and outcomes investigated in them were quite similar across study designs. For example, only 8 trials of any design investigated psychosocial

**Table 6**

Outcomes investigated in primary empirical research on psychosocial interventions in OUD treatment, 1971 – 2019.

	Experimental studies ( $n = 194$ )		Observational studies ( $n = 86$ )				Empirical studies evaluating patient outcomes ( $n = 280$ ) <sup>b</sup>
	RCTs ( $n = 183$ )	QESs <sup>a</sup> ( $n = 11$ )	Prospective cohorts ( $n = 64$ )	Retrospective cohorts ( $n = 15$ )	Cross-sectional studies ( $n = 7$ )	Qualitative studies ( $n = 25$ )	
<b>Patient outcomes, <math>n</math> (%)</b>							
Drug use, $n$ (%)	150 (82.0)	7 (63.6)	59 (92.2)	12 (80.0)	6 (85.7)	n/a	234 (83.6)
Retention, $n$ (%)	164 (89.6)	8 (72.7)	47 (73.4)	6 (40.0)	4 (57.1)	n/a	229 (81.8)
Mental health symptoms	80 (43.7)	8 (72.7)	28 (43.8)	1 (6.7)	3 (42.9)	n/a	120 (42.9)
Criminality	37 (20.2)	3 (27.3)	32 (50.0)	4 (26.7)	1 (14.3)	n/a	77 (27.5)
Employment	43 (24.6)	1 (9.1)	21 (32.8)	4 (26.7)	2 (28.6)	n/a	71 (25.4)
Risk behaviours	27 (14.8)	1 (9.1)	11 (17.2)	–	1 (14.3)	n/a	40 (14.3)
Craving, withdrawal-related mood	28 (15.3)	6 (54.5)	11 (17.2)	–	2 (28.6)	n/a	47 (16.8)
Treatment satisfaction	20 (10.9)	1 (9.1)	15 (23.4)	2 (13.3)	3 (42.9)	n/a	41 (14.6)
Transfer to other health services	26 (14.2)	–	5 (7.8)	–	–	n/a	31 (11.1)
Transfer to other psychosocial services	16 (8.7)	–	3 (4.7)	–	–	n/a	19 (6.8)
Health-related quality of life	17 (9.3)	1 (9.1)	8 (12.5)	1 (6.7)	–	n/a	27 (9.6)
<b>Study outcomes, <math>n</math> (%)</b>							
Illicit drug use assessed?							
Yes, biologically verified	134 (73.2)	6 (54.5)	37 (57.8)	6 (40.0)	2 (28.6)	n/a	185 (66.1)
Yes, self-report only	19 (10.4)	1 (9.1)	16 (25.0)	5 (33.3)	2 (28.6)	n/a	43 (15.4)
No	27 (14.8)	4 (36.4)	9 (14.1)	3 (20.0)	2 (28.6)	n/a	45 (16.1)
Unclear	3 (1.6)	–	2 (3.1)	1 (6.7)	1 (14.3)	n/a	7 (2.5)
Patient attrition reported?	66 (36.1)	2 (18.2)	25 (39.1)	3 (20.0)	–	n/a	96 (31.5)

Notes. <sup>a</sup> Quasi-experimental studies. <sup>b</sup> Excludes qualitative studies.



**Table 7**

Settings, populations, interventions, and outcomes of RCTs evaluating stand-alone psychosocial interventions (Designs 1-3) to adjunct psychosocial interventions (Designs 4-5), 1971 – 2019.

	Stand-alone psychosocial interventions			Adjunct psychosocial interventions		All RCTs (N = 183)
	Design 1 (Psychosocial vs. psychosocial; n = 26)	Design 2 (Psychosocial vs. pharma; n = 5)	Design 3 (Psychosocial vs. pharma + psychosocial; n = 6)	Design 4 (pharma vs. pharma + psychosocial; n = 40)	Design 5 (Adding different psychosocial to pharma; n = 106)	
<b>Treatment settings, n (%)</b>						
<b>General health care</b>	<b>1 (3.8)</b>	<b>2 (40.0)</b>	<b>1 (16.7)</b>	-	<b>4 (3.8)</b>	<b>8 (4.4)</b>
Primary care	1(3.8)	1 (20.0)	-	-	4 (3.8)	6 (3.3)
Acute care	-	-	1 (16.7)	-	-	1 (0.5)
Inpatient	-	1 (20.0)	-	-	-	1 (0.5)
<b>Specialty addiction care</b>	<b>12 (46.2)</b>	<b>2 (40.0)</b>	<b>2 (33.3)</b>	<b>32 (80.0)</b>	<b>75 (70.8)</b>	<b>123 (67.2)</b>
Outpatient	5 (19.2)	1 (20.0)	-	28 (70.0)	65 (61.3)	99 (54.1)
Residential /inpatient	3 (11.5)	-	1 (16.7)	2 (5.0)	5 (4.7)	11 (6.0)
Multiple	1 (3.8)	-	1 (16.7)	-	2 (1.9)	4 (2.2)
Unclear	3 (11.5)	1 (20.0)	-	2 (5.0)	3 (2.8)	9 (4.9)
<b>Research project site</b>	<b>3 (11.5)</b>	-	<b>1 (16.7)</b>	<b>3 (7.5)</b>	<b>14 (13.2)</b>	<b>21 (11.5)</b>
<b>Corrections</b>	<b>3 (11.5)</b>	<b>1 (20.0)</b>	<b>2 (33.3)</b>	<b>1 (2.5)</b>	<b>1 (0.9)</b>	<b>8 (4.4)</b>
Multiple	-	-	-	-	1 (0.9)	1 (0.5)
Other	1 (3.8)	-	-	1 (2.5)	3 (2.8)	5 (2.7)
Unclear	6 (23.1)	-	-	3 (7.5)	8 (7.5)	17 (9.3)
<b>Treatment modalities,n(%)</b>						
Individual treatment	13 (50.0)	3 (60.0)	3 (50.0)	24 (60.0)	66 (62.3)	109 (59.6)
Group treatment	3 (11.5)	2 (40.0)	-	5 (12.5)	12 (11.3)	22 (12.0)
Family/couples treatment	-	-	-	-	5 (4.7)	5 (2.7)
Combination of treatment	9 (34.6)	-	3 (50.0)	7 (17.5)	20 (17.9)	39 (21.3)
Unclear	1 (3.8)	-	-	4 (10.0)	3 (2.8)	8 (4.4)
<b>Target populations, n (%)</b>						
Adults only	23 (88.5)	4 (80.0)	3 (50.0)	36 (90.0)	91 (85.8)	157 (85.8)
Special	2 (7.7)	1 (20.0)	3 (50.0)	4 (10.0)	12(11.3)	22 (12.0)
Multiple	1 (3.8)	-	-	-	3 (2.8)	4 (2.2)
<b>Patient characteristics, n (%)</b>						
Sample size, <i>Mdn (IQR)</i>	100 (100.3)	63.0 (103.0)	161 (315.5)	92 (87.0)	82.0 (89.5)	85.0 (92)
Gender reported? n (%)	25 (96.2)	4 (80.0)	6 (100)	39 (97.5)	104 (98.1)	178 (97.3)
% Male	77.2	80.3	93.1	75.5	62.7	69.0
Age reported? n (%)	22 (84.6)	4 (80.0)	4 (66.7)	33 (82.5)	101 (95.3)	164 (89.6)
Age, <i>M (SD)</i>	34.9 (4.3)	34.5 (7.9)	35.3 (3.7)	35.5 (5.8)	36.8 (5.4)	36.2 (5.4)
Years opioids used reported? n (%)	10 (38.5)	1 (20.0)	3 (50.0)	15 (37.5)	34 (32.1)	63 (34.4)
Years opioids used, <i>M (SD)</i>	10.4 (4.9)	5.2 (-)	12.1 (5.6)	11.0 (3.9)	11.3 (4.0)	11.0 (4.1)
Type(s) of opioids used, n (%)						
Heroin	20 (76.9)	1 (20.0)	1 (16.7)	17 (42.5)	44 (41.5)	83 (45.4)
Unspecified	4 (15.4)	2 (40.0)	-	14 (35.0)	42 (39.6)	62 (33.9)
Multiple	1 (3.8)	1 (20.0)	3 (50.0)	6 (15.0)	17 (16.0)	28 (15.3)
Prescription	-	1 (20.0)	2 (33.3)	2 (5.0)	1 (0.9)	6 (3.3)
Opium	1 (3.8)	-	-	1 (2.5)	2 (1.9)	4 (2.2)
Other substance use assessed, n (%)	15 (57.7)	3 (60.0)	5 (83.3)	26 (65.0)	94 (88.7)	143 (78.1)
<b>Comorbid mental disorder (s) assessed, n (%)</b>						
No	12 (46.2)	3 (60.0)	1 (16.7)	23 (57.5)	36 (34.0)	75 (41.0)
Yes, studied	12 (46.2)	1 (20.0)	4 (66.7)	15 (37.5)	57 (53.8)	89 (48.6)
Yes, excluded <sup>d</sup>	1 (3.8)	1 (20.0)	-	2 (5.0)	11 (10.4)	15 (8.2)
Unclear	1 (3.8)	-	1 (16.7)	-	2 (1.9)	4 (2.2)
<b>Pharmacotherapies used, n (%)</b>						
Methodone	-	3 (60.0)	2 (33.3)	27 (67.5)	65 (61.3)	97 (53.0)
Buprenorphine	-	1 (20.0)	-	5 (12.5)	11 (10.4)	17 (9.3)
Buprenorphine/Naloxone	-	1 (20.0)	1 (16.7)	1 (2.5)	7 (6.6)	10 (5.5)
Naltrexone	-	-	2 (33.3)	3 (7.5)	10 (9.4)	15 (8.2)
Multiple/other	-	-	1 (16.7)	3 (7.5)	11 (10.4)	15 (8.2)
Unclear	-	-	-	1 (2.5)	2 (1.9)	3 (1.6)
None	26 (100)	-	-	-	-	26 (14.2)
<b>Interventions, n (%)</b>						
Intervention manualized? (% yes)	10 (38.5)	2 (40.0)	1 (16.7)	18 (45.0)	51 (48.1)	82 (44.8)
Months of Treatment, <i>M (SD)</i>	4.2 (3.7)	1.6 (1.5)	3.8 (2.4)	4.9 (5.4)	5.4 (3.8)	5.0 (4.1)
Psychological interventions	13 (50.0)	2 (40.0)	2 (33.3)	26 (65.0)	49 (46.2)	92 (50.3)

(continued on next page)

Table 7 (continued)

	Stand-alone psychosocial interventions			Adjunct psychosocial interventions		All RCTs (N = 183)
	Design 1 (Psychosocial vs. psychosocial; n = 26)	Design 2 (Psychosocial vs. pharma; n = 5)	Design 3 (Psychosocial vs. pharma + psychosocial; n = 6)	Design 4 (pharma vs. pharma + psychosocial; n = 40)	Design 5 (Adding different psychosocial to pharma; n = 106)	
Addiction sector interventions	5 (19.2)	–	1 (16.7)	1 (2.5)	4 (3.8)	11 (6.0)
System management interventions	3 (11.5)	–	–	3 (7.5)	9 (8.5)	15 (8.2)
Social interventions	1 (3.8)	1 (20.0)	–	1 (2.5)	9 (8.6)	12 (6.6)
Harm reduction	–	–	–	–	2 (1.9)	2 (1.1)
Other interventions	3 (11.5)	1 (20.0)	–	5 (12.5)	7 (6.6)	16 (8.7)
Multiple psychosocial interventions	1 (3.8)	1 (20.0)	3 (50.0)	4 (10.0)	26 (24.5)	35 (19.1)
<b>Patient outcomes, n (%)</b>						
Drug use	13 (50.0)	2 (40.0)	5 (83.3)	32 (80.0)	98 (92.5)	150 (82.0)
Retention	21 (80.8)	4 (80.0)	6 (100)	34 (85.0)	99 (93.4)	164 (89.6)
Mental health symptoms	9 (34.6)	2 (40.0)	1 (16.7)	22 (55.0)	46 (43.4)	80 (43.7)
Criminality	5 (19.2)	–	2 (33.3)	7 (17.5)	23 (21.7)	37 (20.2)
Employment	9 (34.6)	–	2 (33.3)	7 (17.5)	25 (23.6)	43 (23.5)
Risk behaviours	5 (19.2)	–	3 (50.0)	3 (7.5)	16 (15.1)	27 (14.8)
Cravings	6 (23.1)	1 (20.0)	1 (16.7)	7 (17.5)	13 (12.3)	28 (15.3)
Treatment satisfaction	3 (11.5)	1 (20.0)	–	4 (10.0)	12 (11.3)	20 (10.9)
Transfer to health services	7 (26.9)	1 (20.0)	2 (33.3)	5 (12.5)	11 (10.5)	26 (14.2)
Transfer to psychosocial services	5 (19.2)	–	–	2 (5.0)	9 (8.6)	16 (8.7)
Health-related quality of life	1 (3.8)	1 (20.0)	1 (16.7)	4 (10.0)	10 (9.5)	17 (9.3)
<b>Study outcomes, n (%)</b>						
Illicit drug use assessed?						
Yes, biologically verified	11 (42.3)	1 (20.0)	5 (83.3)	28 (70.0)	89 (84.0)	134 (73.2)
Yes, self-report only	3 (11.5)	1 (20.0)	1 (16.7)	5 (12.5)	9 (8.5)	19 (10.4)
No	9 (34.6)	3 (60.0)	–	7 (17.5)	8 (7.5)	27 (14.8)
Unclear	3 (11.5)	–	–	–	–	3 (1.6)
Patient attrition reported?	11 (42.3)	4 (80.0)	4 (66.7)	10 (25.0)	37 (34.9)	66 (36.1)

interventions in general health care settings; most RCTs were conducted in specialty addiction care (67.2 % of all trials; range = 33.3 % [Design 3] - 80.0 % [Design 5]; Table 7). Individual psychological therapies, provided to adult males, was most commonly investigated across all trial designs regardless of research question. Social assistance and harm reduction interventions were rarely investigated in RCTs, and in-program illicit drug use and retention were the most-studied outcomes across all trials, regardless of design or research question. Risk behaviours, satisfaction with OUD treatment, transfer to other (medical) health services, transfer to other psychosocial services, and health-related quality of life were all infrequently investigated, regardless of whether psychosocial interventions were studied as stand-alone treatments or adjunct treatments to pharmacotherapies.

#### 4. Discussion

This scoping review comprehensively mapped 48 years of primary empirical research on psychosocial interventions in OUD treatment, with or without pharmacotherapies. Most evidence originated in the USA, and about 60 % of the evidence base consists of RCTs, indicating that efficacy and effectiveness of psychosocial interventions has been an overriding research priority. Observational studies of patients seeking OUD treatment accounted for about 30 % of available evidence, but use of these study designs decreased over the review period. In general, very limited in-depth qualitative evidence is available (8% of studies) on topics such as patient perspectives on OUD treatment or social processes within treatment programs, although this evidence source has appeared more frequently in recent years.

Our summary of the evidence base using the SPICE framework (settings, perspective, intervention, comparison, evaluation; Booth, 2006) provided a broad perspective on the state of evidence in this area,

and insights into knowledge gaps and future research directions. Studies overwhelmingly collected evidence from specialty addiction treatment services and in particular, community-based outpatient OUD treatment programs. Very limited evidence is available on psychosocial interventions delivered in general health care settings and corrections. Important knowledge gaps were also observed regarding the reporting of patient characteristics in this literature. Type of opioids used by patients was not reported in about one-third of empirical studies, and more than half of evidence sources did not report duration of opioid use. Among the small number of studies that assessed those variables, long-term, adult male heroin users were the most commonly studied patient population. Little evidence is therefore available on the role of psychosocial interventions in the treatment of newer, early-career opioid users, including youth and young adults. Only 3% of the entire empirical literature focused on prescription OUD: scant evidence is therefore available to inform whether psychosocial interventions are helpful in addressing the prescription opioid emergencies that have emerged in recent years in Canada (Belzak and Halverson, 2018), the USA (Center for Behavioral Health Statistics and Quality, 2015), and in other countries.

A heterogeneous set of 36 psychosocial interventions were investigated over the review period. As noted in previous reviews, such heterogeneity is problematic for drawing omnibus conclusions about the effects of psychosocial interventions in OUD treatment when conducting systematic reviews with meta-analyses (Amato et al., 2011; Dugosh et al., 2016; Mayet et al., 2004). Psychological therapies, primarily delivered to individual patients, accounted for almost half of all psychosocial interventions, with contingency management (CM) emerging as the most-studied approach across evidence sources. Surprisingly, despite a growing literature describing characteristics of interventions, settings, clinicians, and implementation processes associated with

transportability of CM from academia to community practice (Hartzler et al., 2012) we did not identify any empirical studies of CM – or any other psychosocial interventions for that matter – that investigated those implementation science variables in relation to *patient outcomes*. While the field thus recognizes the need to investigate characteristics of programs and providers to support scale-up and spread of CM, evidence has not been forthcoming on the impact of these implementation science variables on treatment retention, illicit drug use, and other patient outcomes.

Additional knowledge gaps were identified with respect to other psychosocial intervention. Social assistance approaches (e.g., education, employment, social support) and harm reduction were rarely investigated – even in the context of stand-alone psychosocial interventions, as were addiction sector and system management (e.g., case management) approaches. From a disciplinary perspective, these results suggest that collaborative research with clinical psychologists has historically dominated investigations of psychosocial interventions in OUD treatment. In contrast, research undertaken in collaboration with the addiction service sector (i.e., abstinence-based addiction treatment providers, harm reduction service providers), and other disciplines with substantive interests in OUD treatment (e.g., social work) has generally not been pursued. Finally, notwithstanding the dominance of RCTs as an evidence source in the present review, less than half of extant trials reported that they used manualized psychosocial interventions, suggesting that treatment fidelity has not been a particularly high investigative priority in experimental research.

Of 183 RCTs included in this review, research questions overwhelmingly focused on the impact of adding psychosocial interventions to pharmacotherapies (about 80 % of RCTs and quasi-experiments) as opposed to investigations of stand-alone psychosocial interventions (about 20 % of experimental studies). Given the historical development of methadone maintenance as a first-line treatment approach for OUD, this focus is understandable. This imbalance may also account for our findings that most evidence has accumulated on long-term opioid users. Nevertheless, echoing a previous systematic review (Mayet et al., 2004) our results revealed a continuing evidence gap regarding the potential benefits of stand-alone psychosocial interventions for people with OUD and, more broadly, a need to investigate outcomes among patients who are unable or unwilling to enrol in OAT and other pharmacotherapies.

As anticipated, in-treatment illicit drug use and retention were the most-studied outcomes evaluated in this area, regardless of evidence source or type of trial design. These results likely reflect common assumptions that the fundamental objectives of any treatment intervention for substance use disorder, including OUD, are to (a) reduce severity of drug use, and (b) ensure treatment attendance (Marchand et al., 2019). However, it has been long argued that a narrow focus on drug use as a primary endpoint in clinical research neglects other outcomes important to patients, such as quality of life and employment (Maisto and Cooper, 1980). Despite calls to broaden the scope of outcomes evaluated in treatments for substance use disorders (e.g., Tiffany et al., 2012), we identified several evidence gaps regarding the potential of psychosocial interventions to deliver broader rehabilitative outcomes. Only about one-quarter of empirical studies of psychosocial interventions reported criminality or employment outcomes. Studies investigating the impact of psychosocial interventions on risk behaviours, satisfaction with OUD treatment, craving/mood, health-related quality of life, or transfer to other psychosocial services were very rare. Collectively, these results suggest that the putative rehabilitative effects of psychosocial interventions have historically been a low priority in empirical research. Instead, most empirical research has implicitly conceptualized these interventions narrowly, by prioritizing their study as a means to improve in-program abstinence from illicit substance and treatment attendance – whether or not pharmacotherapy was provided.

#### 4.1. Strengths and limitations

To our knowledge, this is the first scoping review conducted on the topic of psychosocial interventions in OUD treatment, with or without pharmacotherapies. It provides a comprehensive description of the range of evidence sources that have been produced, types of interventions investigated, research questions that have been prioritized, and patient outcomes that have been evaluated. The scoping review approach allowed for us to identify the range and nature of extant evidence – features of the knowledge base that are typically excluded by systematic reviews. Other strengths include an exhaustive approach to identifying relevant empirical studies, and use of appropriate inter-rater metrics to validate inclusion and coding decisions. However, interpretation of our results should be tempered by several limitations. First, studies were excluded when they did not have full text available, and if they were published in languages other than English. This reduced the international scope and comprehensiveness of our results, perhaps inflating the number of references identified from North American sources. Second, our review procedures omitted clinical practice guidelines and grey literature reports. Finally, while our results have been synthesized across different evidence sources (e.g., comparative studies, observational studies, qualitative research), additional insights would be obtained by conducting in-depth coding of study characteristics, tailored to different study designs.

## 5. Conclusions

### 5.1. Implications for practice

Clinical practice guidelines advise that services should routinely offer psychosocial interventions in OAT programs (e.g., [Bruneau et al., 2018; Kleber, 2007]). This recommendation is consistent with Dole and Nyswander's endorsement of "skillful counseling" and other non-pharmacologic interventions to support the rehabilitative aims of OAT. However, limited evidence is available to inform the question of whether psychosocial interventions improve outcomes other than in-program retention and abstinence from illicit drug use. In addition, the ongoing prescription opioid emergencies in North America and elsewhere have created growing interest in expanding treatment for OUD beyond specialist addiction programs to general health services (e.g., primary, emergency, and hospital care settings) and in particular for new opioid users. Unfortunately, scant evidence is available on the use of psychosocial interventions in these treatment settings, which may further entrench the view that general health services should only be conceived as venues for initiating pharmacotherapies, and that referral to specialty addiction programs is required to access psychosocial support services designed to promote longer-term rehabilitative outcomes (Korthuis et al., 2017; Weimer et al., 2019). Moreover, research on psychosocial interventions in the context of prescription OUD is almost non-existent, save for 6 RCTs addressing diverse research questions and 3 observational studies. More evidence has been produced on individual psychological therapies than any other non-pharmacologic intervention approach; however, most studies have not examined intervention fidelity, and synthesis of findings into practice guidelines is hampered by the diversity of intervention approaches used in the literature. Beyond psychological interventions, few studies have examined the potential of social assistance (education, employment, social support) and harm reduction interventions to improve OUD treatment outcomes. Collectively, our findings problematize the capacity of the evidence base to inform the development of service pathways and models that clearly specify *where* and *when* psychosocial interventions should be implemented in OUD treatment, *what* non-pharmacological approaches should be offered, and *what* patient outcomes should be expected beyond in-program illicit substance use and retention.

## 5.2. Implications for research

Pharmacotherapies, and in particular, OAT, are now the primary accepted treatment for people with OUD. But relatively few RCTs have been conducted to investigate either the relative efficacy/effectiveness of stand-alone psychosocial treatments compared to stand-alone pharmacotherapies, or the benefits of adding psychosocial interventions to pharmacotherapies. Our results suggest that these questions deserve greater attention in future studies. This would complement the bulk of existing trial evidence, which assumes that psychosocial interventions should play only an adjunct role to pharmacotherapies. Additional research is also needed to bolster the evidence base on psychosocial interventions for OUD treatment in general health services, for newer opioid users, and to broaden consideration of possible effects of social assistance (education, employment, social support) and harm reduction interventions in the treatment of OUD. Finally, given our findings that rehabilitative and patient-oriented outcomes are infrequently studied, future research should prioritize these outcome measures to complement the historical focus on in-program illicit drug use and retention.

## Contributors

TCW, FH, DA, & DH designed the review and provided oversight. MH, NB, KKG, & AL developed and executed the article retrieval and data extraction procedures. All authors contributed to production of the manuscript, reviewed and edited drafts for intellectual content, and approved the final submitted version.

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## Declaration of Competing Interest

The authors report no declarations of interest.

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Readers interested in accessing our database on psychosocial interventions for specific purposes related to their respective research are invited to contact the first author through the corresponding email address.

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.drugalcdep.2020.108434>.

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