

# Outpatient psychosocial substance use treatments for young people: An overview of reviews

Nicole Snowdon<sup>a,b,\*</sup>, Julaine Allan<sup>a</sup>, Anthony Shakeshaft<sup>b,d</sup>, Debra Rickwood<sup>c,d</sup>, Emily Stockings<sup>b</sup>, Veronica C. Boland<sup>b</sup>, Ryan J. Courtney<sup>b</sup>

<sup>a</sup> Lives Lived Well Research Team, Lives Lived Well, P.O. Box 9374, Orange, NSW, 2800, Australia

<sup>b</sup> National Drug and Alcohol Research Centre, 22 - 32 King Street, The University of New South Wales, Randwick, Sydney, NSW, 2031, Australia

<sup>c</sup> Research and Evaluation, headspace, The National Youth Mental Health Foundation, South Tower, Level 2, 485 La Trobe St, Melbourne VIC 3000, Australia

<sup>d</sup> Faculty of Health, Allawoona St, University of Canberra, Bruce, Canberra, ACT, 2617, Australia

## ARTICLE INFO

### Keywords:

Adolescence

Overview of reviews

Psychosocial treatment

Substance use

## ABSTRACT

**Background:** Systematic reviews and meta-analyses (reviews) conflict regarding the efficacy and feasibility of substance disorder treatments for young people (YP). This overview of reviews, synthesizes, and methodologically assesses reviews examining substance disorder interventions for YP in outpatient settings.

**Methods:** Reviews published between 1990 and March 2018 were searched using EBM Reviews, PsycINFO, Embase, Ovid Medline, and Campbell Collaboration. Reviews investigating efficacy and/or feasibility of YP substance disorder treatments in outpatient settings were included.

**Forty-three reviews met all inclusion criteria:** To appraise methodological biases, 40 reviews were assessed using A Measurement Tool to Assess Systematic Reviews 2 (AMSTAR2) and 3 were narratively assessed. One reviewer (NS) extracted study data and evaluated all 43 reviews. For inter-rater reliability, 13 (30%) reviews were extracted and appraised in duplicate by a second reviewer (JA, RC or ES). Agreement on AMSTAR2 ratings reached 100%. Agreement was moderate;  $\kappa = .52$  ( $p < .05$ ), 95% CI (.20, .84).

**Results:** All high quality methodological reviews ( $n = 6$ ) focused on intervention efficacy and none on treatment feasibility. One ( $n = 1$ ) high quality review reported evidence for an intervention. Multidimensional Family Therapy (MDFT) has possible efficacy in reducing YP substance use when compared to treatment as usual, Cognitive Behavior Therapy, Adolescent Community Reinforcement Approach and Multifamily Educational Therapy.

**Conclusions:** Methodological and reporting quality of reviews require improvement. High quality reviews focused on intervention efficacy but treatments commonly lacked evidence. One high quality review found MDFT demonstrated promising outcomes. Reviews examining feasibility of interventions were of low methodological quality.

## 1. Introduction

### 1.1. Burden of harm of substance use among young people

Substance-related disorders (substance use disorder and substance induced disorders) are a worldwide phenomenon (APA, 2013). Substance use commonly starts in early adolescence, peaks in early adulthood and lifelong substance-related disorders typically emerge during this critical period (Kipping et al., 2012; Steinberg, 2014; UNODC, 2016). There is no universally recognized age range for adolescence and early adulthood (UN, 2011; WHO, 1993). However, it is established that adolescence and early adulthood is a period of rapid physical,

neurodevelopmental, and psycho-social changes (Zelazo and Carlson, 2012). With risk-taking behavior common during this sensitive period, lifelong problematic substance use patterns begin to emerge (Kipping et al., 2012; Steinberg, 2014).

Substance-related disorders cause significant burden of harm to young people (YP). Worldwide, YP aged 15 to 29 years, are the second largest group to die from substance-related disorders, with 23% of all substance use deaths in 2015 in this age group (UNODC, 2018). Other substance use harms in this group are caused by accidental and deliberate injury, an increase in hospitalization due to an exacerbation of mental illness (Hall et al., 2016); and several preventable chronic diseases, malnutrition, brain injury, overdose, and premature death

\* Corresponding author at: Lives Lived Well, P.O. Box 9374, Orange, NSW, 2800, Australia.

E-mail address: [nicole.snowdon@liveslivedwell.org.au](mailto:nicole.snowdon@liveslivedwell.org.au) (N. Snowdon).

<https://doi.org/10.1016/j.drugalcdep.2019.107582>

Received 2 May 2019; Received in revised form 12 August 2019; Accepted 16 August 2019

Available online 25 September 2019

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(Toumbourou et al., 2007).

### 1.2. Responding to the burden of harm of substance use among YP

Prevention, early intervention, and treatment strategies for YP substance-related disorders require a tailored approach to fit with the emotional, cognitive, and psychosocial developmental needs of this cohort (Holmbeck et al., 2006; Knudsen, 2009; Leshner, 1999).

Recently published systematic reviews have synthesized evidence for the prevention of YP substance-related disorders (Das et al., 2016; Kuntsche and Kuntsche, 2016; Onrust et al., 2016; Van Ryzin et al., 2016) and found that family-based preventative strategies and school-based interventions that take developmental progress into consideration are somewhat effective in reducing substance initiation. However, Cochrane systematic reviews investigating school and family-based interventions (Foxcroft and Tsertsvadze, 2012; Gates et al., 2006; Gilligan et al., 2019) concluded that preventative interventions produce mixed results, with the primary studies being characterized by low methodological quality. While further research into preventative interventions is required, YP experiencing substance-related problems are likely to disengage from the education system and family unit – the settings where preventative interventions are primarily provided (Bond et al., 2007; Kreek et al., 2005). As such, effective treatments for problem use are required.

### 1.3. Treatment delivery settings for YP substance use

As YP substance-related disorders exist on a spectrum – from mild, moderate through to severe – treatments must appropriately correspond to this continuum (APA, 2013). Inpatient rehabilitation centers are common treatment platforms for individuals with severe substance-related disorder (Sacks et al., 2008). However, many YP will not have developed a severe disorder and will not require intensive and costly residential treatment (Winters, 2003; Becker and Kayo, 2017). Further, YP experiencing substance related problems are not likely to seek help for these concerns (Berridge et al., 2018), but instead will present to the primary care or community setting (outpatient setting) for other medical, psychological, or social concerns (Reavley et al., 2010).

The outpatient setting is a diverse and accessible setting where medical, psychological, and social concerns such as homelessness can be addressed (England et al., 2015). Outpatient settings include mental health clinics, general practitioner rooms and specialist drug and alcohol services (SAMHSA, 2016). Treating professionals range from psychologists, social workers, nurses, general practitioners, mental health clinicians and generalist counsellors (SAMHSA, 2016).

The outpatient setting can provide crucial treatment for YP with a substance-related disorder – from screening, assessment, treatment, referral through to follow-up care (Becker and Curry, 2008). YP with a substance-related disorder are more likely to have a co-morbid psychiatric illness and are more likely to report a history of trauma than YP without a substance-related disorder (Deas, 2006). As such, the multi-disciplinary nature of the outpatient setting is ideal for care planning and holistic service delivery (Breslin et al., 2003).

### 1.4. Treatment for YP with substance-related disorders

Treatment for YP with substance-related disorders generally comprise of psychosocial interventions with or without pharmacotherapy (Hammond, 2016). Psychosocial interventions are defined as educational or interpersonal activities or techniques that aim to address cognitive, emotional, behavioral, environmental, or interpersonal problems, with the objective of improving functioning and overall health (England et al., 2015).

Pharmacotherapy for substance-related disorders is typically indicated where a severe disorder has been identified (Waxmonsky and Wilens, 2005). However, the prescribing guidelines for

pharmacotherapy options for YP with substance-related problems are narrowly defined and often require specialist medical oversight (Waxmonsky and Wilens, 2005). Therefore, psychosocial treatments are considered the first-line response to YP substance-related disorders (Courtney and Milin, 2015). Psychosocial therapies are accepted and prolific in the treatment of YP's substance use problems (Stockings et al., 2016).

While there is widespread uptake of psychosocial interventions for YP with problematic substance use, there is no consensus on which one is best (Stockings et al., 2016). Over the past 20 years, many systematic reviews and meta-analyses have examined psychosocial interventions for YP with substance-related disorders (e.g. Austin et al., 2005; Das et al., 2016; Jensen et al., 2011; Tait and Hulse, 2003; Tanner-Smith et al., 2013; Tripodi, 2009; Waldron and Turner, 2008; Williams and Chang, 2000). This research provides a large and disparate body of knowledge, with a variety of approaches promoted to be effective; and it remains unclear what the best treatment types are for YP.

### 1.5. Synthesizing best-evidence practice

Numerous psychosocial interventions have been evaluated in individual clinical trials in the outpatient setting (Winters, 1999; Winters et al., 2014). Consequently, there have been systematic reviews and meta-analyses, rapid reviews and scoping reviews combining the research results of many studies (Austin et al., 2005; Becker and Curry, 2008; Tait and Hulse, 2003; Toumbourou et al., 2007; Williams and Chang, 2000). This plethora of data is not unique to psychosocial treatments for YP with substance-related disorders and, in other fields, has led to the synthesis of existing reviews. A synthesis of reviews allows for a comparative summary of available evidence from more than one review of different interventions for the same problem and/or where different outcomes are addressed (Aromataris et al., 2015). The Cochrane Collaboration refers to these higher order reviews as overview of reviews and has established protocols for them (Green and Higgins, 2011). Higher-order reviews are sometimes referred to as umbrella reviews (Biondi-Zoccai, 2016). However, umbrella reviews include scoping reviews, rapid reviews, literature reviews and individual studies as well as systematic reviews. Like systematic reviews and meta-analysis (hereafter reviews) of individual studies, it is important that overview of reviews (hereafter overview) critique the methodological quality of existing reviews to identify the best quality evidence, rather than assume that all existing reviews are of equivalent quality. To date there have been no overview to methodologically critique and synthesize the best available evidence for outpatient-delivered psychosocial substance abuse treatments for YP.

While clinical trials are our most reliable source of evidence-based treatments, the translation of interventions tested in highly controlled clinical settings into the practice environment is fraught with a conflict between fidelity and implementation (Glasgow and Emmons, 2007; Sackett et al., 1996). This implementation tension is attributable to health interventions occurring in complex, multi-faceted environments, where competing priorities are the norm (Rogers, 2008). Often, the translation from research to practice does not occur, particularly where resources are minimal (Grimshaw et al., 2012). Given the heterogeneity of YP engaged in problematic substance use, an overview of the adoption and implementation of evidence-based treatments is required.

### 1.6. Aims

This overview aims to i) identify existing systematic reviews, assess their methodological quality, describe their characteristics and ii) synthesize the findings of the reviews rated high or moderate methodological quality, and iii) investigate what psychosocial interventions are efficacious in addressing YP's substance abuse behaviors in outpatient settings and determine how they are implemented.

## 2. Methods

### 2.1. Search strategy

In March 2018, one researcher (NS) searched EBM Reviews-Cochrane DSR, PsycINFO, Medline (Epub Ahead of Print, In-Process and Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present), Embase and The Campbell Collaboration. These databases were searched using terms relating to YP, substance use, treatments and reviews, and all results were combined (see supplementary materials - “gold set” and “search history”). Existing reviews, Scopus and PubMed Clinical Queries were manually searched to identify any additional reviews.

### 2.2. Eligibility criteria and screening

A protocol was developed a priori and registered with PROSPERO (CRD42017078464). Peer reviewed systematic reviews and meta-analyses in English published between 1990 and March 2018 were included. The search did not extend prior to 1990 as the Cochrane Collaboration had not yet been founded and few systematic reviews or meta analyses were published prior to this time (Aromataris et al., 2015).

Employing the PRISMA model (Moher et al., 2009), one researcher (NS), downloaded and imported all references. The title, abstract and full text screening of all included studies was independently conducted by two reviewers (NS and JA), and those that clearly did not meet the inclusion criteria were excluded. Disagreements were collated at each stage and settled through discussion until consensus was reached. Reviews and meta-analyses were included where they met the following criteria:

- 1 Given inconsistent age-range definitions of YP, a defined age range was not applied. Nomenclature such as youth, adolescent, and early adulthood was instead used. Where reviews included adult populations, to be included, at least half of the included primary studies had to specifically identify a younger population group.
- 2 At least half of the studies contained in a review had to comprise of YP experiencing problematic substance use behavior and/or meet the criteria for substance-related disorder according to the DSM-5 (APA, 2013). Substances of interest were licit and/or illicit substances of dependence (i.e. alcohol, cannabis, amphetamines, cocaine, opioids/opiates, hallucinogens, methylenedioxymethamphetamine, benzodiazepines, inhalants, emerging psychoactive substances, tobacco, and tobacco related products (WHO, 1974)).
- 3 At least half of the studies contained in a review had to include a psychosocial intervention intended to address substance use.
- 4 At least half of the studies in a review had to include the outpatient delivery of an intervention where a health professional initiates, delivers or oversees the delivery of the intervention. This may include general practitioners, nurses, psychologists, social workers or generalist AOD counsellors.
- 5 Where a review included studies of the efficacy of an intervention, more than half of the included studies had to have reported on the outcome measure of YP substance use behaviors (e.g. self-report, urinalysis). Reviews reporting on results of implementation had to have included qualitative and/or quantitative measures of acceptability, perspectives, perceptions, behaviors, barriers, cost-effectiveness; and/or experiences of YP, their families and/or treating health professionals.
- 6 Reviews reporting on a combination of implementation and efficacy results were included if more than half of the primary studies comprised the following outcomes:
- 7 YP substance use behaviors; and/or
- 8 Measures of acceptability, attitudes, perceptions, preference,

behaviors, barriers, cost-effectiveness; and/or experiences of YP, their families and/or treating health professionals.

### 2.3. Data extraction

For data extraction purposes the following variables were extracted into a pre-piloted extraction database using Microsoft Excel 2010 in accordance with methodology adopted by Aromataris et al. (2015):

- 1 Population characteristics (age range, substance of interest, co-occurring concerns (e.g. mental illness, delinquency and homelessness)
- 2 Review details (such as country of origin of review and the countries of origin of the primary studies),
- 3 Data on the design types of the primary studies and synthesis method used, intervention modality, results of the analysis; and
- 4 A summary of the interventions found to be efficacious and/or feasible (see supplementary materials - “extraction database”).

### 2.4. Methodological assessment

The methodological quality of the included reviews was evaluated utilizing the A Measurement Tool to Assess Systematic Reviews 2 (AMSTAR 2) critical appraisal tool (Shea et al., 2017). This is a validated assessment of the methodological quality of systematic reviews and meta-analyses that include randomized controlled trials (RCTs), non-randomized controlled trials (NRCTs) and quasi-randomized controlled trials. The critical elements assessed by AMSTAR 2 are the development of an a priori review protocol, the search methods employed, the justification of excluded studies, a satisfactory method of assessing Risk of Bias (ROB) (Shea et al., 2017), and the appropriateness of the statistical analysis. With the assessment of these items, AMSTAR2 establishes the comprehensiveness of a review, the appropriateness of the methodology and analysis, identifies any methodological flaws (e.g. accounting for heterogeneity and confounding variables), and assesses the likelihood of small study biases (Shea et al., 2017).

The study quality was categorized based on the overall AMSTAR 2 score as: high (no critical weaknesses), moderate (more than one non-critical weakness), low (one critical weakness) and critically low (more than one critical weakness) (see supplementary material - “quality assessment”). Given the inclusion of reviews that synthesized qualitative studies, the authors assessed the methodology of these reviews in terms of the reporting of an a priori review protocol, the search methods employed, the justification of excluded studies and the methodological assessment of overall rigor in the included primary studies.

### 2.5. Inter-rater reliability

One author (NS) extracted information from all papers and a random sample of papers were extracted by a second reviewer to assess reliability. To determine the inter-rater reliability of data extraction and AMSTAR 2 assessment, one author (NS) used block allocation to randomly select 13 of the 43 included studies (30%) for independent extraction by a second reviewer (in which three reviewers [RC, JA, or ES] shared the role to act as a second reviewer). A fourth independent reviewer (VB) compared each pair of extracted records for agreement. The 30% threshold was set since three independent researchers reviewed a sub-set of the total. This was to ensure robustness of the results and to overcome biases that could have occurred if one researcher assessed all 30%. Inter-rater agreement has been grouped into five key domains: Review details, PICO, included studies detail, Included studies outcomes, and AMSTAR 2 ratings. Consistency on each domain was rated with either a “yes” or “no”. To achieve a “yes”, at least 80–90% of the content must achieve consistency. The review authors achieved 100% agreement on overall AMSTAR2 quality ratings. Agreement on the content of data extracted across all studies and all raters was

**Table 1**  
Inter-rater agreement assessment.

Author, year	Inter-rater agreement					Agreement on overall AMSTAR2 Rating
	Rating pair	Agreement on review details (e.g. author details, type of study, source of funding)	Agreement on PICO (e.g. description of participants and intervention, databases searched)	Agreement on details of included studies (e.g. study types, publication date range, quality tool used)	Agreement on included studies outcomes (e.g. study quality, methods of analysis, interventions found effective/feasible)	
Steinka-Fry et al., 2017	ES and NS	Yes	Yes	Yes	Yes	Yes
Allen et al., 2016	ES and NS	Yes	Yes	Yes	Yes	Yes
Bender et al., 2011	ES and NS	Yes	Yes	Yes	Yes	Yes
William, 2000	ES and NS	Yes	Yes	No	Yes	Yes
Engle and MacGowan, 2009	JA and NS	Yes	Yes	Yes	Yes	Yes
Filges et al., 2015a	JA and NS	Yes	Yes	Yes	Yes	Yes
Filges et al., 2015b	JA and NS	Yes	Yes	Yes	Yes	Yes
Spas et al., 2012	JA and NS	Yes	No	Yes	No	Yes
Bender et al., 2006	RC and NS	Yes	Yes	Yes	Yes	Yes
Calabria et al., 2011	RC and NS	Yes	Yes	Yes	Yes	Yes
Grenard et al., 2006	RC and NS	Yes	Yes	Yes	Yes	Yes
Xiang, 2013	RC and NS	Yes	No	Yes	Yes	Yes
Karki et al., 2012	RC and NS	Yes	Yes	Yes	Yes	Yes

moderate; Cohens Kappa = .52 ( $p < .05$ ), 95% CI (.20, .84).

Given this result, authors consulted on disagreements and determined that discrepancies were due to the variability of review reporting. For example, in the extraction from Engle and MacGowan (2009), two assessors (NS and JA) did not agree on the PICO date item. Engle and MacGowan (2009) state that “The search was undertaken in the beginning of 2006” (p. 220). Consequently, one rater (JA), extracted the publication date range of included studies as “anything up to 2006”. As indicated in Table 1 of Engle and MacGowan (2009, p. 224) the publication date range of the included papers was between 1992 until 2004. Therefore, the second rater (NS) extracted “up to 2004”. Both extractions were correct, however they were gleaned from different areas of the review paper. In a second example, Allen et al. (2016), it is stated that the country of origin for the included papers was “all but 2 studies were conducted in the USA”, with no further information provided on the country of origin for two studies (p. 11). One rater (NS), extracted this narrative data as “USA - two countries not specified”, whereas the second rater (JA) states that this data was inadequately reported.

As detailed in Table 1, AMSTAR2 ratings achieved 100% agreement and extraction discrepancies were minor. As such, it was deemed unnecessary to re-review all papers, as following mutual discussion across reviewers a consensus was reached that discrepancies were due to ambiguity in original reporting.

### 3. Results

#### 3.1. Summary of search results

The search results are summarized in the PRISMA flowchart (see Fig. 1). A total of 7033 references were found and following the removal of duplicates, 5551 references were retrieved and independently screened against the inclusion criteria. After the exclusion of 5370 articles, 181 full-text articles were reviewed and an additional 137 were excluded (see supplementary materials - “excluded studies”). Of the 43 included studies, 35 aimed to review the efficacy of an intervention/s, 3 reviewed the implementation of an intervention/s, and 5 assessed both the efficacy and implementation of an intervention/s.

#### 3.2. Methodological quality

Of the 43 included studies, 3 were not suitable for AMSTAR 2 assessment. For 40 reviews where AMSTAR 2 was applicable, 6 (15%) were rated high quality, one (2.5%) moderate quality, one low quality (2.5%) and the remaining 32 reviews (80%) were rated critically low quality. The 32 reviews rated as low and critically low quality were found to have several methodological problems, such as an inadequate assessment of ROB, inadequate reporting on methods of study screening and data extraction. Of these 40 reviews, 30 did not adequately assess the ROB in the included RCTs and NRCTs (Shea et al., 2017). Twenty-nine of the 40 studies did not provide a list of excluded studies and their reason for exclusion, 31 did not state if their review strategy and analysis plan was developed a priori, 31 did not provide a comprehensive literature search and 24 did not provide comprehensive details on the included studies (see supplementary materials - “quality assessment”).

Three of the included articles were not suitable for AMSTAR 2 assessment. A narrative analysis of these articles was conducted (see supplementary materials - “quality assessment”). These reviews were found to have several methodological concerns: they inadequately described how their searches were conducted and did not satisfactorily assess the methodological quality of the included reviews. These papers cannot be considered methodologically robust, and their results cannot be regarded as reliable.



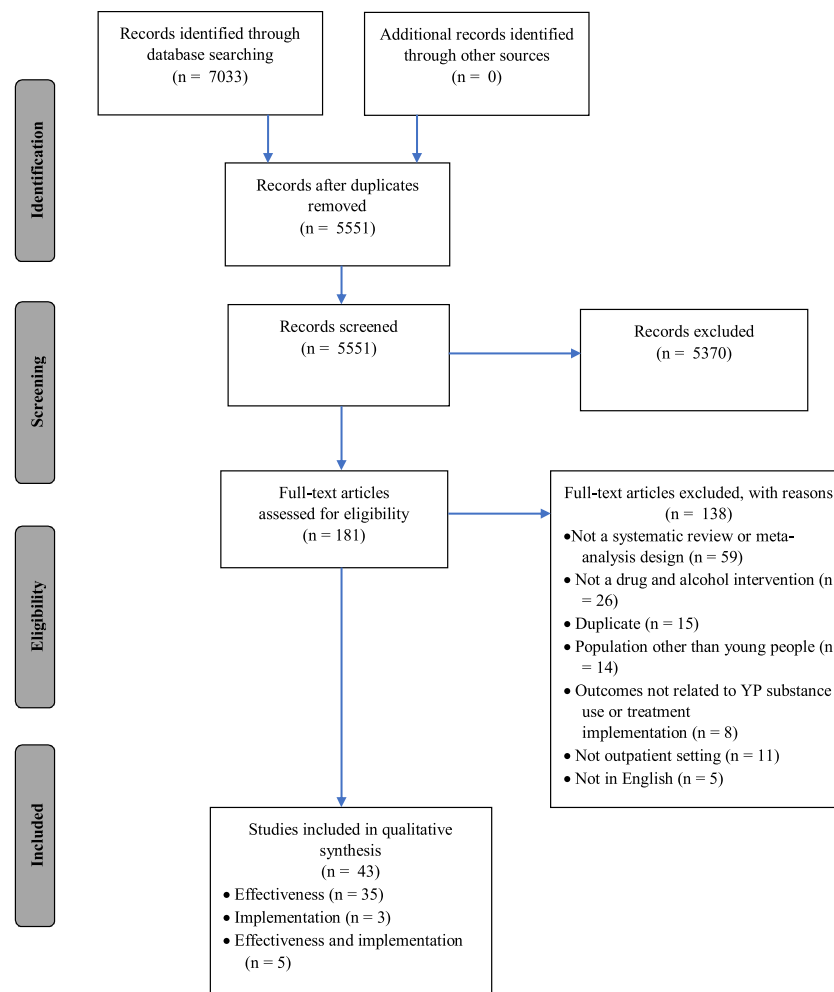


Fig. 1. PRISMA flowchart.

### 3.3. Characteristics of included studies

#### 3.3.1. Country of origin

The 43 reviews that met inclusion criteria, comprised a wide range of targeted behaviors and interventions. The publication dates ranged from 2000 to 2017, with 39 of the reviews published after 2006. In relation to the review authors' country of origin, 24 reviews were conducted in the USA, 7 in Scandinavian countries, 4 in the UK, 4 in Australia, 2 in Canada, 1 in Ireland and 1 in China. The publication date ranges and countries of the primary articles included in these reviews can be found in supplementary materials – “characteristics of included studies”.\*

#### 3.3.2. Efficacy and implementation

Thirty-five of the included reviews examined the efficacy of an intervention addressing YP's substance use. Six reviewed the efficacy and implementation of an intervention targeting YP's substance use. Finally, 2 reviews investigated the implementation of an intervention utilized to address YP's substance use. All the reviews examining the implementation of an intervention were critically flawed methodologically (see “6. Supplementary materials – characteristics of included studies”).

#### 3.3.3. Study design

In terms of included study designs, 34 reviews included RCTs, 14 included NRCTs, 3 included qualitative designs and 8 included other study designs, such as pre-post designs, meta-analyses, literature

reviews and observational designs. Seven reviews did not describe the study designs included in their review (Bender et al. (2006); Friend and Colby (2006); Jensen et al. (2011); Spas et al. (2012); Tanner-Smith et al. (2015b), 2013 and Williams and Chang (2000)). Two studies (Friend and Colby (2006) and Spas et al. (2012)) did not state the number of studies included in their review. Most reviews focused on the effect of the intervention on outcomes of substance use reduction; e.g. self-reported frequency of use, urinalysis results, number of at-risk behaviors.

#### 3.3.4. Participant characteristics

The majority (n = 33) of the reviews applied an age range, which was most frequently between 12 and 24; and 10 did not specify an age (see Fig. 2). Substances under review are detailed in Table 2. Twenty-six studies investigated substance use in general, 6 examined alcohol use, 5 tobacco use, 2 cannabis use and 4 non-opioid use.

#### 3.3.5. Population(S)/ groups targeted

Five reviews examined interventions for conduct disorder and/or delinquency, and 4 assessed outcomes for Indigenous peoples and ethnic minorities. Two reviews assessed outcomes for co-morbid mental health diagnoses, 1 for homelessness, 1 for non-treatment seeking persons, and 30 did not identify additional participant characteristics.

#### 3.3.6. Types of interventions

The intervention modalities investigated varied. As detailed in Table 2, 14 of the reviews examined psychosocial interventions, and 5

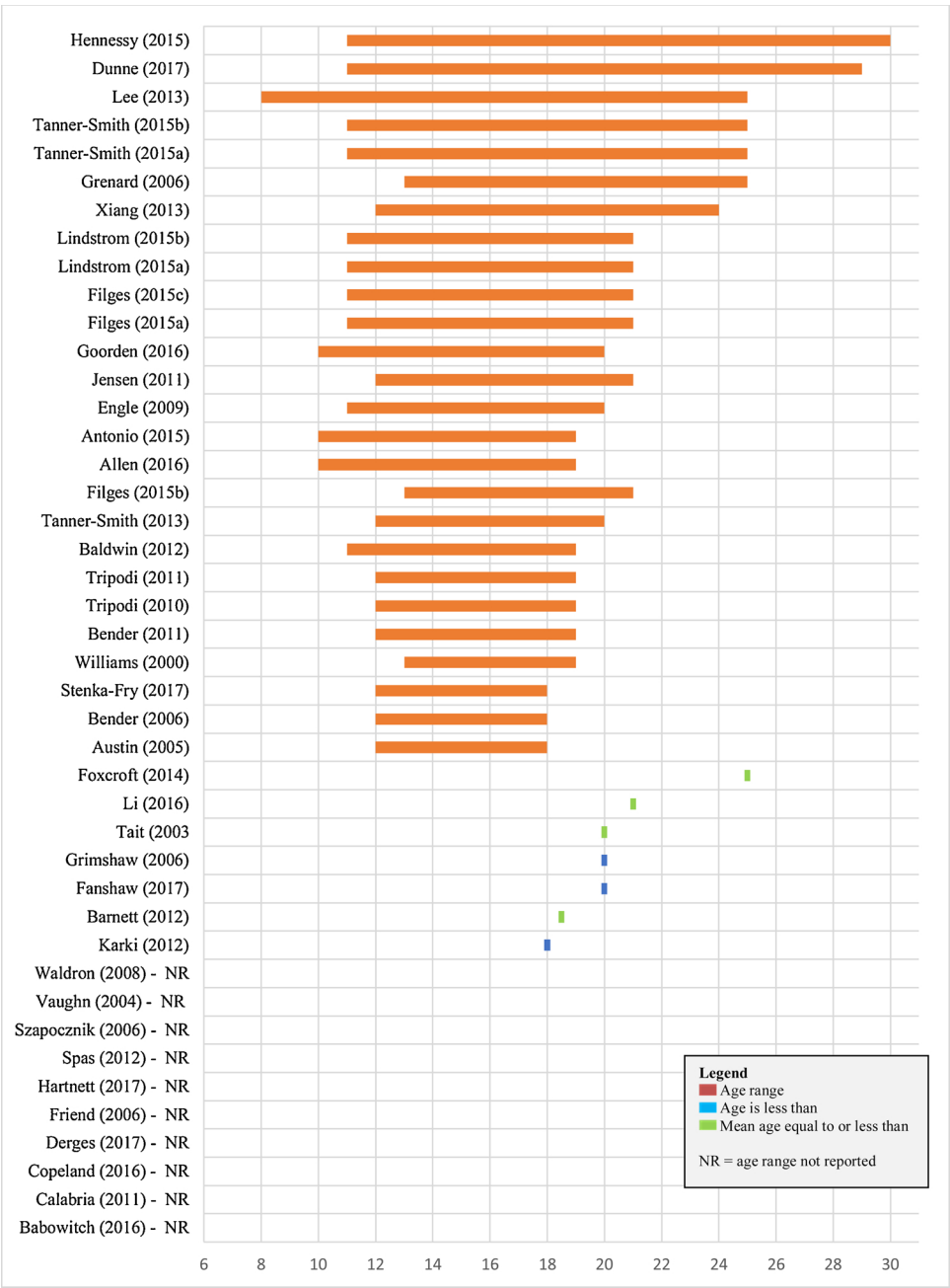


Fig. 2. Age ranges of included reviews.

reviews studied psychosocial interventions and pharmacological interventions. Eight of the reviews examined family interventions and 10 examined brief interventions (BI), including motivational interviewing (MI).

3.3.7. Treatment outcomes

In terms of outcomes, 40 reviews provided conclusions on the efficacy of their included interventions. Interventions with claimed sufficient evidence or insufficient evidence were collated. With varying review quality, it was not possible to provide intervention effect sizes. Some reviews stated efficacy for several interventions. Only interventions employed in the outpatient setting were collated. Overall, conclusions on the efficacy of 53 interventions were found. To examine the assertions of evidence against review quality, each instance of claimed evidence was collated and matched to its respective AMSTAR 2 rating. As noted in Table 3, Multidimensional Family Therapy (MDFT) and

parental training were the only interventions rated as high/moderate quality on AMSTAR 2 with mixed/some evidence in support of their efficacy. As is illustrated in Fig. 3, reviews that claimed sufficient evidence were mostly rated poor quality, whereas high quality reviews typically reported insufficient evidence in support of the interventions investigated.

3.4. Synthesis of High/Moderate quality reviews

As noted in Fig. 3, there is a tendency of reviews with critical methodological flaws to claim adequate evidence in support of an intervention model. Where multiple reviews have been conducted on the same intervention, there are conflicting efficacy conclusions; reviews into brief strategic family therapy (BSFT), family functional therapy (FFT), MDFT and MI have reported both sufficient evidence in support of these intervention modes, and insufficient evidence for their efficacy.

**Table 2**

Intervention type, the substance under review and corresponding AMSTAR2 rating.

Intervention & substance under investigation	AMSTAR 2 RATING					Total
	Critically low	Low	Moderate	High	N/A	
<b>BI</b>	<b>4</b>				<b>1</b>	<b>5</b>
Alcohol	1				1	2
Substance use	1				1	1
Tobacco	2					2
<b>BSFT</b>				<b>1</b>	<b>1</b>	<b>1</b>
Substance use				1	1	1
<b>CBT</b>				<b>1</b>	<b>1</b>	<b>1</b>
Non-opioid				1	1	1
<b>Culturally sensitive intervention</b>	<b>2</b>					<b>2</b>
Substance use	2					2
<b>Family therapy</b>	<b>3</b>					<b>3</b>
Substance use	3					3
<b>FBT</b>				<b>1</b>	<b>1</b>	<b>1</b>
Non-opioid				1	1	1
<b>FFT</b>	<b>1</b>			<b>1</b>	<b>2</b>	<b>2</b>
Non-opioid				1	1	1
Substance use	1				1	1
<b>Group work</b>	<b>1</b>				<b>1</b>	<b>1</b>
Substance use	1				1	1
<b>MDFT</b>				<b>1</b>	<b>1</b>	<b>1</b>
Non-opioid				1	1	1
<b>MI</b>	<b>4</b>			<b>1</b>	<b>5</b>	<b>5</b>
Alcohol				1	1	1
Substance use	4					4
<b>Parent training</b>			<b>1</b>		<b>1</b>	<b>1</b>
Substance use			1		1	1
<b>Psychosocial &amp; pharmacological intervention</b>	<b>4</b>	<b>1</b>				<b>5</b>
Substance use	2					2
Tobacco	2	1				3
<b>Psychosocial intervention</b>	<b>13</b>				<b>1</b>	<b>14</b>
Alcohol	3					3
Cannabis use	2					2
Substance use	8				1	9
<b>Youth engagement</b>					<b>1</b>	<b>1</b>
Substance use					1	1
<b>Total</b>	<b>32</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>43</b>

BI = Brief intervention; BSFT = Brief Strategic Family Therapy; CBT = Cognitive Behavioral Therapy; FBT = Family Behavioral Therapy; FFT = Family Functional Therapy; MDFT = Multidimensional Family Therapy; MI = Motivational Interviewing.

Given the methodological flaws of reviews assessed as critically low and low quality, reliable conclusions cannot be drawn from their results. Therefore, only the results of the high/moderate quality reviews will be described further. For further descriptions see supplementary materials - "characteristics of included studies".

#### 3.4.1. Allen, Garcia-Huidobro and Porta (2016)

Allen et al. (2016), conducted a systematic review of the efficacy of parental training interventions delivered to parents of substance using YP aged 10–19 years. They found 42 articles that met their selection criteria and found a high overall bias in the primary studies. They reported positive effects for parenting interventions for tobacco, poly-substance use, alcohol use and illicit substance use. However, the authors did not provide information on the content of the sessions or the main objectives of the intervention, making an interpretation to practice unviable. Allen et al. (2016) did not conduct a meta-analysis on the pooled effect sizes of the included intervention arms, making firm conclusions difficult. Further, in their narrative synthesis, they combined all intervention arms, despite the varying methodological quality

**Table 3**

Count of intervention evidence level and corresponding AMSTAR 2 rating.

Intervention evidence level claim	AMSTAR 2 RATING				
	Critically low	Low	Moderate	High	Grand Total
<b>Insufficient</b>	<b>3</b>	<b>1</b>		<b>5</b>	<b>9</b>
Behavioral support		1			1
BSFT				1	1
CBT				1	1
FBT				1	1
FFT				1	1
MI	1			1	2
Psychosocial intervention	2				2
<b>Mixed/some</b>	<b>2</b>		<b>1</b>	<b>1</b>	<b>4</b>
BI	1				1
Group work	1				1
MDFT				1	1
<b>Sufficient</b>	<b>40</b>				<b>40</b>
ACRA	1				1
BI	4				4
BSFT	3				3
CBT	6				6
Combo of MI & CBT	1				1
Cultural programs	2				2
Family therapy*	5				5
FBT	1				1
FFT	4				4
MDFT	5				5
MI	4				4
MST	3				3
Parental training			1		1
Psychosocial intervention	1				1
<b>Total</b>	<b>45</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>53</b>

BI = Brief intervention; BSFT = Brief Strategic Family Therapy; CBT = Cognitive Behavioral Therapy; FBT = Family Behavioral Therapy; FFT = Family Functional Therapy; MDFT = Multidimensional Family Therapy; MI = Motivational Interviewing; ACRA = Adolescent Community Reinforcement Approach; MST = Multi-Systemic Therapy; \* = General family therapy – no model specified.

of the included studies. This method reduces confidence in their findings.

#### 3.4.2. Filges, Andersen and Jørgensen (2015)

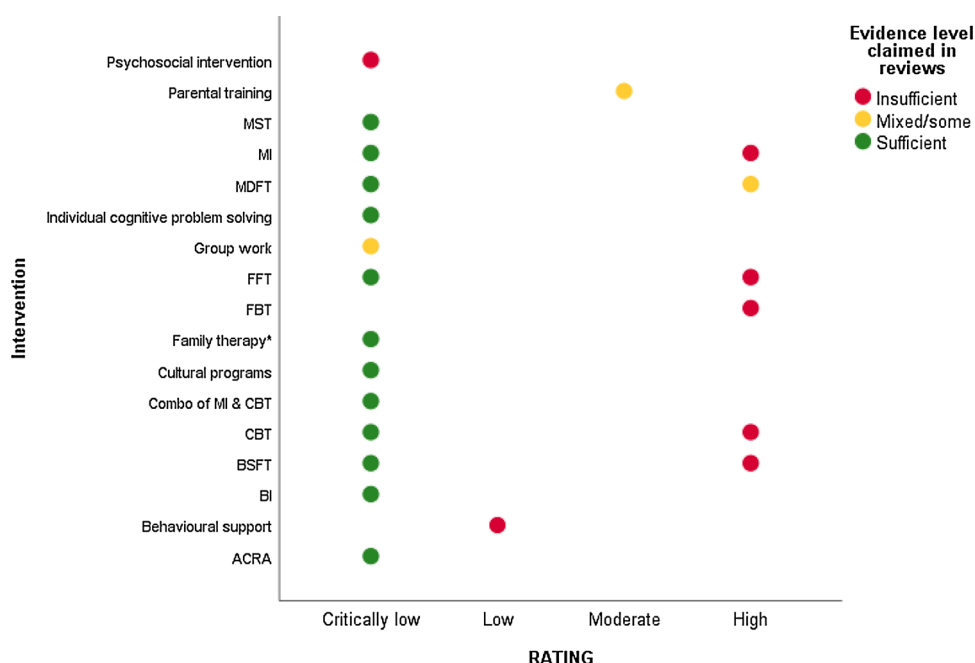
Filges et al. (2015a) reviewed the efficacy of manualized Family Functional Therapy (FFT) in outpatient settings for YP aged 11–21 years, using non-opioid drugs. Two RCTs met the review authors inclusion criteria and they found that the included studies were characterized by a lack of reporting of key issues (e.g. allocation concealment and number of randomized participants) and therefore an adequate assessment of ROB could not be conducted.

Filges et al. (2015a) planned to conduct a meta-analysis on study outcomes, however, as only one of the included studies provided data on substance use reduction, this was not feasible. The authors narratively analyzed the relative effects reported in the primary studies. The one primary study that provided numerical results on substance use, reported significant effects at 4-month follow-up and no significant effect after 7 months.

Filges et al. (2015a) conclude that given the few methodologically robust trials on FFT, no conclusions can be drawn about the efficacy of FFT.

#### 3.4.3. Filges and Jørgensen (2015)

Filges and Jørgensen (2015), conducted a review of the efficacy of cognitive behavioral therapy (CBT) in outpatient settings for YP aged 13–21 years, engaged in non-opioid drug use. Filges and Jørgensen (2015) found 7 RCTs that met their inclusion criteria and found that none of the included studies had low ROB. Further, 4 of the included studies were characterized by a lack of reporting of key issues (e.g.



**Fig. 3.** Evidence level claimed in reviews and corresponding AMSTAR 2 ratings.

Note: BI = Brief intervention; BSFT = Brief Strategic Family Therapy; CBT = Cognitive Behavioral Therapy; FBT = Family Behavioral Therapy; FFT = Family Functional Therapy; MDFT = Multidimensional Family Therapy; MI = Motivational Interviewing; ACRA = Adolescent Community Reinforcement Approach; MST = Multi-Systemic Therapy; \* = General family therapy – no model specified

allocation concealment and sequence generation). This lack of reporting did not allow for an adequate assessment of ROB.

Filges and Jørgensen (2015) conducted a meta-analysis on the relative effects of CBT compared to the Adolescent Community Reinforcement Approach (ACRA), Chestnut Bloomington Outpatient and Assertive Continuing Care (CBOP + ACC), Drugs Harm Psychoeducation curriculum (DHPE), FFT, Interactional Therapy (IT), MDFT and Psychoeducational Therapy (PET). They found no relative effects of CBT (with and without add-on components) on substance use reduction or secondary outcome measures, at any length of follow-up time compared to ACRA, CBOP + ACC, DHPE, FFT, IT, MDFT and PET.

### 3.4.4. Filges, Rasmussen, Andersen and Jørgensen (2015)

Filges et al. (2015b) reviewed the efficacy of MDFT in outpatient settings for YP aged 11–21, engaged in non-opioid drug use.

Filges et al. (2015b) found 5 RCTs that met their inclusion criteria and found none of the included studies had low risk of bias. Further, the authors found that they were unable to complete an adequate ROB on 3 of the included studies given a lack of reporting on key issues.

Filges et al. (2015b) conducted a meta-analysis on the relative effects of MDFT compared to CBT, peer group, treatment as usual (TAU), multifamily educational therapy (MEI), adolescent group therapy, and ACRA. Effects were analyzed 6- and 12-months following intake.

Their results demonstrated MDFT had small effects on substance use severity at 6 months (SMD = -0.30, 95% CI -0.53 to -0.07,  $p < 0.05$ ) compared to CBT peer group, TAU, MEI and ACRA. This effect was maintained at the 12-month mark; (SMD = -0.23, 95% CI -0.39 to -0.06,  $p < 0.05$ ) when compared to CBT, peer group, TAU, ACRA and adolescent group therapy.

Filges et al. (2015b) found at 6-month follow-up that pooled effects of drug abuse frequency for MDFT was small but significant, when compared to CBT, peer group, TAU, and motivational enhancement therapy/cognitive behavioral therapy-5 (MET/CBT5) (SMD = -0.24; 95% CI -0.43 to -0.06;  $p < 0.05$ ). This effect was not found for MDFT at 12-month follow-up when compared to CBT, TAU, peer group and MET/CBT5/ACRA. For secondary outcomes, they found MDFT demonstrated significant participant retention when compared to CBT, peer group, TAU, ACT and MET/CBT5 (OR = 0.44; 95% CI 0.21 to 0.94;  $p < 0.05$ ).

The review authors concluded that while these results are

promising, there remains a scarcity of available data, small effect sizes and confidence intervals that are mostly close to zero. As such, caution should be taken with the interpretation of these findings.

### 3.4.5. Foxcroft, Coombes, Wood, Allen and Santimano (2014)

Foxcroft et al. (2014) conducted a review of the efficacy of MI on alcohol use and alcohol related problems in YP aged up to 25 years of age.

Foxcroft et al. (2014) found 66 RCTs that met their inclusion criteria and found that overall, the included studies were of low to moderate quality. Less than half of the included studies reported randomization methods, and a minority of the studies conducted blinding or performance or detection bias. The review authors conducted a meta-analysis on 55 of the included studies at 4 or more months follow-up. Small effects were found for the quantity of alcohol consumed – this was calculated as a decrease from 13.7 drinks per week to 12.2 drinks per week (SMD = -0.14, 95% CI -0.20 to -0.08). They found that there was a reduction from 2.74 days per week to 2.57 days per week on alcohol consumption (SMD -0.14; 95% CI -0.23 to -0.05). In terms of effect of alcohol related problems, the review found a small effect (SMD = -0.08, 95% CI -0.15 to 0.00). In relation to the other outcome measures analyzed, no other significant effects were found.

The authors concluded that given the small effect sizes are not likely to be clinically significant, the heterogeneity of findings, and due to the high risk of bias in the primary studies, there is no substantive evidence for the efficacy of MI in this population.

### 3.4.6. Lindstrøm, Rasmussen, Kowalski, Filges and Jørgensen (2015)

Lindstrøm et al. (2015a) conducted a review of the efficacy of manualized BSFT in the outpatient setting for YP aged 11–21 engaged in non-opioid drug use. The review authors found 3 RCTs that met their inclusion criteria found that the included studies were characterized by a lack of reporting of key issues to allow for an adequate assessment of ROB (e.g., methods of sequence generation, allocation concealment, and reporting of outcome data).

Lindstrøm et al. (2015a) found that BSFT had a small effect on substance use frequency at the completion of treatment compared to low contact comparison, community treatment programs and group treatment (SMD = -0.04, 95% CI -0.25, 0.34). However, they found no impact on family functioning at the completion of treatment in



comparison to control conditions. Results indicated that there was a positive impact of BSFT on treatment retention compared to controls. The review concluded that given the lack of quality studies on BSFT, these results must be interpreted with caution.

### 3.4.7. Lindstrøm, Saidj, Kowalski, Filges, Rasmussen, and Jørgensen (2015)

Lindstrøm et al. (2015b) reviewed the efficacy of manualized family behavior treatment (FBT) in the outpatient setting for YP aged 11–21 using non-opioid drugs.

Lindstrøm et al. (2015b) found two RCTs meeting their inclusion criteria and found that neither of the included studies were characterized as robust in terms of ROB and that a lack of reporting of key issues impeded an adequate assessment of ROB (e.g. reporting of outcome data). The authors concluded that this lowers confidence in the findings of these primary studies.

The review found no statistically significant effect of FBT on drug use frequency at the end of treatment when compared to individual cognitive problem solving (ICPS) (SMD = 0.49, 95% CI -0.51, 1.50). No significant effects were found for family functioning or at-risk behaviors.

For additional details on these high/moderate quality reviews, consult Table 4.

## 4. Discussion

This overview of reviews synthesized and assessed reviews examining efficacy and/or implementation of psychosocial interventions for YP experiencing substance-related disorders in outpatient settings. Forty-three systematic reviews and meta-analyses conducted over 17 years focusing on interventions for YP's substance use behaviors in outpatient settings met the inclusion criteria. No significant effects for any intervention type were found. The one high quality review that reported possible efficacy of an intervention, Filges et al. (2015b), found that MDFT had small positive effects on substance use compared to CBT, TAU, MEI and ACRA.

While many of the reviews focused on RCTs and NRCTs, 30 out of 40 of these reviews did not conduct an appropriate methodological assessment of the primary studies, seriously compromising the interpretation of their findings. The lack of appropriate methodological techniques utilized in most of the included reviews is troubling. Systematic reviews and meta-analyses are regarded as the highest grade of empirical evidence (Evans, 2003). As such, with the rapid increase of primary studies and secondary reviews in this field, it could be considered a tertiary synthesis of these reviews would provide clear and unambiguous results (Aromataris et al., 2015). However, this has not happened. Moreover, there appears to be a concerning trend of lower quality reviews claiming sufficient evidence in support of an intervention, whereas higher quality reviews tended toward reporting a lack of evidence.

Six out of the 43 reviews were found to have high/moderate methodological quality. The one moderate quality review, Allen et al. (2016), examined parental training interventions. While this review found that parental training produced mixed results, it did not report the specifics of the parental training interventions. Of the remaining 5 high quality reviews, 4 of these highlighted the lack of methodological robustness of the primary studies. Filges et al. (2015a) found that given the lack of methodologically robust trials examining FFT, no conclusions can be made on its efficacy. Filges and Jørgensen (2015) found that CBT did not demonstrate efficacy when compared to a range of other psychosocial interventions. Foxcroft et al. (2014) concluded that given small effect sizes, there is no substantive evidence for the efficacy of MI for YP substance use. Lindstrøm et al. (2015a) reported that BSFT had a small effect on substance use compared to low contact comparison, community treatment programs and group treatment. While promising, given the small number of studies included in their review and

the quality of these trials, these results may be overstated, and further investigation is required. Finally, Lindstrøm et al. (2015b) examined FBT in the outpatient setting for YP substance use concerns. The authors found no effect of FBT when compared to ICPS.

Despite an abundance of research conducted on the efficacy of psychosocial interventions in the reduction of substance use, few reviews, or studies in general, have focused on the implementation of interventions. In this overview, eight reviews included a component of assessing the implementation of an intervention. However, all eight of these reviews were found to be of critically low quality. Without quality implementation studies to guide processes, the translation of research into practice is unlikely.

### 4.1. Limitations

Given the scope of this overview of reviews and rapid dissemination of research, it is likely that an unknown quantity of high-quality primary studies has not been examined for efficacy or implementation. Further, reviews rated as critically low quality may have included primary studies of sound methodological quality in their reviews and as such may have been omitted in this overview. Further, several treatment modalities that may show efficacy and/or feasibility were not found in this overview search, e.g. dialectical behavior therapy, Acceptance and Commitment Therapy, harm minimization counselling strategies and 12-step approaches. Methodologically rigorous systematic reviews and meta-analyses into these intervention models are an area for further research.

## 5. Conclusions

Systematic reviews and meta-analyses are vital sources of information in this field. These reviews must be conducted with methodological rigor, to provide the highest grade of evidence. It is possible that a range of psychosocial interventions are efficacious for the treatment of YP's substance use. Based on the results of one high quality review, MDFT has the strongest available evidence and BSFT may have promise. While the pursuit of efficacious interventions for this population is essential, it remains that without sufficient details on the feasibility of implementation and adaptability of interventions in the practice setting, conclusions cannot be drawn on the most superior treatments. Future systematic reviews, meta-analyses and clinical trials on both efficacy and implementation need to be conducted with methodological rigor.

### Role of funding source

This work was supported by the NSW Ministry of Health. The funding body had no role in the design, analysis or interpretation of the data.

### Contributors

NS, JA, RC, AS, DR and ES all contributed to the design and implementation. NS conducted data extraction and analysis and JA, RC and ES conducted inter-rater reliability extractions. VB conducted inter-rater reliability checks. NS prepared the manuscript with input from all authors. JA and RC provided overall direction and supervision throughout the project.

### Declaration of Competing Interest

None declared.

### Acknowledgements

Thanks to Ms. Mary Kumvaj for providing technical support.

**Table 4**  
Characteristics of high/moderate quality studies.

Author Year Country of review authors	Primary review objectives	Synthesis method/ included study types	Participant characteristics	Intervention investigated	Outcomes	Setting and context (where not detailed in inclusion criteria, setting of primary setting reported)	Use of standard ROB Instrument used to appraise the primary studies and the rating of their quality	Country of origin of primary studies Publication date range	Key results	AMSTAR 2 rating & methodological concerns # of flaws out of 9
Allen et al., 2016 USA	Efficacy of interventions that target parents to impact on YP tobacco, alcohol & illicit drug use	Systematic review x42 RCTs	YP aged 10 to 19 Tobacco, alcohol & illicit drug use	Parent training with a focus on parenting knowledge, skills, practice, or behaviors	Reducing substance use & efficacy in relation to intervention characteristics (dosage, participant characteristics)	Community agency, school, home & combination	Y <input checked="" type="checkbox"/> <input type="checkbox"/> Cochrane ROB (Higgins et al., 2011) The authors found that there was an overall risk of bias in the included studies	All but 2 studies were conducted in the USA (other countries not specified) 1990 to 2012	Less than 12 hours of parental intervention was efficacious in reducing YP substance use	Moderate Excluded studies not provided. Included studies not adequately described 2
Filges, et al., 2015(a), Denmark	Efficacy of FFT on drug abuse reduction for YP in treatment for non-opioid drug use	Systematic review RCTs & NRCTs searched. x2 RCTs	YP aged 11 to 21 years non-opioid drug use (e.g., cannabis, amphetamine, ecstasy, or cocaine).	Manual-based outpatient FFT treatment	Outcome variable measuring drug use, family functioning, education/vocational participation, risk behavior or other adverse effects;	Outpatient setting	Y <input checked="" type="checkbox"/> <input type="checkbox"/> ROBINS-I (Sterne et al., 2016) Inadequate information to assess risk of bias (e.g. allocation concealment and number of participants randomized)	X2 USA 1989 to 2001	Inadequate evidence to conclude on effects of FFT	Nil High 0
Filges and Jørgensen (2015) Denmark	Efficacy of CBT for YP in treatment of non-opioid drug use	Meta- analysis RCTs & NRCTs searched. x7 RCTs	YP aged 13 to 21 years non-opioid drug use (e.g., cannabis, amphetamine, ecstasy, or cocaine).	CBT interventions specifically directed at treating YP for non-opioid drug use - individually or in groups.	Outcome variable measuring drug use, severity of addiction, social functioning and family functioning, education/vocational participation, risk behaviors, other adverse effects (e.g. suicide and overdoses)	Outpatient setting	Y <input checked="" type="checkbox"/> <input type="checkbox"/> ROBINS-I Varied in terms of ROB; no study deemed as low ROB and 4 of the included studies provided inadequate information to assess risk of bias (e.g. method of sequence generation and of allocation concealment)	x 6 USA; x1 Netherlands 1998 to 2011	Inadequate evidence to conclude if the effects of CBT are better than ACRA, Chestnut Bloomington Outpatient + Assertive Continuing Care, Drugs Hamm Psychoeducation curriculum, FFT, Interactional Therapy, MDFT and Psychoeducational Therapy	Nil High 0
Filges et al., 2015 (b) Denmark	Efficacy of MDFT for YP in treatment for non- opioid drug abuse	Meta- analysis RCTs & NRCTs searched. x5 RCTs	YP aged 11 to 21 years non-opioid drug abuse (e.g., cannabis, amphetamine, ecstasy, or cocaine).	Manual-based MDFT interventions	Abstinence or reduction of drug abuse	Outpatient setting	Y <input checked="" type="checkbox"/> <input type="checkbox"/> ROBINS-I None of the included studies were characterized as low risk of bias	X4 USA; X1 Various European countries (Germany, France, Netherlands, Belgium & Switzerland) 2001 to 2014	Insufficient evidence of the efficacy of MDFT, however, some support that MDFT treatment reduces non-opioid drug abuse somewhat more than CBT, peer group, TAU, adolescent group therapy/ multifamily educational therapy and MET/CBT5/ ACRA.	Nil High 0
Foxcroft 2014 UK	Efficacy of MI intended to address alcohol and alcohol- related problems in YP	Meta- analysis x66 RCTs	YP aged up to 25 years Alcohol misuse, dependence &/or alcohol related behavioral problems (e.g. criminal activities)	MI	Alcohol misuse e.g. high-risk drinking, alcohol dependence, addiction severity, alcohol related at risk-behaviors and injuries/accidents	Education setting, healthcare setting, outpatient departments, community-based clinics, youth centers, detention centers.	Y <input checked="" type="checkbox"/> <input type="checkbox"/> Cochrane ROB (Higgins et al., 2011) Included studies were found to be low or moderate quality	x56 USA; x4 UK; x1 Australia; x2 Switzerland; x1 Spain; x1 Brazil; x1 Canada & USA 1998 to 2013	Small significant effects for MI – unlikely to be clinically significant	Nil High 0

(continued on next page)

Table 4 (continued)

Author Year Country of review authors	Primary review objectives	Synthesis method/ included study types	Participant characteristics	Intervention investigated	Outcomes	Setting and context (where not detailed in inclusion criteria, setting of primary setting reported)	Use of standard ROB tool Instrument used to appraise the primary studies and the rating of their quality	Country of origin of primary studies Publication date range	Key results	AMSTAR 2 rating & methodological concerns # of flaws out of 9
Lindstrom 2015a Denmark	Efficacy of BSFT on drug use reduction for young people in treatment for nonopioid drug use	Meta- analysis RCTs & NRCTs included in search. x3 RCTs	YP aged 11 to 21 years Non-opioid drug use (cannabis, amphetamines, ecstasy, or cocaine) use	Manual based BSFT	Outcome variable measuring drug use, severity of addiction, social functioning and family functioning, education/vocational participation, risk behaviors, other adverse effects (e.g. suicide and overdoses)	Outpatient setting	Y <input checked="" type="checkbox"/> N <input type="checkbox"/> ROBINS-I (Sterne et al., 2016) Insufficient reporting of key methods to confidentially assess rigor (e.g., methods of sequence generation, concealment, and completeness of outcome data)	x3 USA 2003 to 2011	Insufficient evidence to conclude efficacy of BSFT on non-opioid drug use in YP compared to other such as community treatment programs, group treatment, and minimum contact comparison	Nil High 0
Lindstrom 2015b Denmark	Efficacy of FBT for non-opioid drug use (e.g., cannabis, amphetamine, ecstasy, or cocaine)	Meta- analysis RCTs & NRCTs included in search. x2 RCTs	YP aged 11 to 21 Non-opioid drug use	Manual-based FBT	Have reported at least one eligible outcome variable measuring (primary) abstinence, reduction of drug use, (secondary) family functioning, education or vocational involvement, retention, risk behavior or any other adverse effects	Outpatient setting	Y <input checked="" type="checkbox"/> N <input type="checkbox"/> ROBINS-I None of the included studies were characterized as low risk of bias	X2 USA 1994 to 2001	No evidence that FBT has an effect drug use compared to Individual Cognitive Problem-Solving and supportive counselling	Nil High 0

BSFT = Brief Strategic Family Therapy; CBT = Cognitive Behavioral Therapy; FBT = Family Behavioral Therapy; MDFT = Multidimensional Family Therapy; MET = Motivational Enhancement Therapy; ACRA = Adolescent Community Reinforcement Approach; MST = Multi-Systemic Therapy; MI = Motivational Interviewing; TAU = treatment as usual; ROBINS-I = Risk of Bias in Non-randomized Studies of Interventions; \* = Partial yes is calculated as a critical flaw.

## 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.2019.107582>.

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