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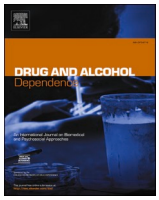

Review

A systematic review of interventions to enhance initiation of and adherence to treatment for alcohol use disorders

Bijayalaxmi Biswal [a], Shruti Bora [a], Radhika Anand [a], Urvita Bhatia [a], Anisah Fernandes [a], Manjita Joshi [a], Abhijit Nadkarni [a,b,*]

[a] Addictions and related-Research Group, Sangath, Goa, India
[b] Department of Population Health, London School of Hygiene and Tropical Medicine, London, UK

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ABSTRACT

Background: Alcohol use disorders (AUDs) contribute significantly to the global disease burden in terms of morbidity and mortality. While effective treatment options exist, engagement with care remains a challenge, impacting treatment outcomes and resource allocation, particularly in resource-constrained settings. In this review, we aim to systematically examine and synthesize the evidence on interventions targeting initiation of and adherence to treatment for AUDs.

Methods: A search was conducted on six electronic databases (MEDLINE, PsycINFO, Embase, Global Health, CINAHL and CENTRAL) using search terms under the following concepts: alcohol use disorders, initiation/adherence, treatments, and controlled trial study design. Due to the heterogeneity in intervention content and outcomes among the included studies, a narrative synthesis was conducted. Risk of bias was assessed using the Joanna Briggs Institute (JBI) critical appraisal tools.

Results: The search yielded 32 distinct studies testing eleven categories of interventions. 23 out of 32 studies reported effectiveness of interventions in improving at least one initiation or adherence outcome, with 11 studies reporting an improvement in at least one outcome related to drinking, and four studies reporting improvements in at least one measure of well-being or disability. Community Reinforcement Approach and Family Training (CRAFT) emerged as a prominent approach for treatment initiation, contingency management for adherence, and motivational interviewing (MI) for both treatment initiation and adherence.

Conclusion: Integrating initiation and adherence interventions into AUD treatment services holds immense potential for optimizing client outcomes and fostering overall well-being. However, generalizability of these strategies remains uncertain owing to the lack of studies conducted in low- and middle-income countries. Addressing this gap is crucial for enhancing global access to effective treatments for AUDs.

1. Background

Alcohol use significantly contributes to both mortality and disability worldwide, accounting for 17 million disability-adjusted life years (DALYs) in the year 2019 (Murray, 2022). In the same year, 107 million people were estimated to be living with an alcohol use disorder (AUD) while 2.44 million deaths were attributed to alcohol use (Murray, 2022).

Effective treatment options for AUDs have been well-documented in a variety of settings. These include medications (e.g., naltrexone, topiramate, disulfiram) (McPheeters et al., 2023), psychological interventions such as motivational interviewing (MI), cognitive behavioural therapy (CBT), brief interventions, contingency management, 12-Step Facilitation (TSF) and community reinforcement approaches (Klimas et al., 2014; Sileo et al., 2021; Kelly et al., 2020) and combined/integrated interventions (e.g., naltrexone with coping skills therapy) (O'Malley, 1992; Anton et al., 2006).

Despite the availability of effective interventions, the treatment gap for AUDs is as high as 83 % (Mekonen et al., 2021), with four out of five individuals with AUD unable to access necessary care due to various reasons (Mekonen et al., 2021; Connery et al., 2020). One of the explanations for this is the poor rate of treatment entry even after diagnosis of AUD (Mekonen et al., 2021). Additionally, treatment engagement for AUDs remains a challenge (Magura, 2011; Lash and Burden, 2006; Weiss, 2004; Walker et al., 2019), with over 50 % of clients dropping out

* Correspondence to: Department of Population Health, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK
E-mail address: abhijit.nadkarni@lshtm.ac.uk (A. Nadkarni).

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before completing the treatment (Magura, 2011). Non-engagement with care negatively affects treatment efficacy of both pharmacological and psychological treatments, leading to little improvement in symptoms (Cramer et al., 2003; Oslin et al., 2008; Zweben et al., 2008). Poor adherence also reduces the efficiency of mental health services owing to unutilised appointment slots and inequitable resource allocation (Barrett et al., 2008; Bosworth, 2010; Ogrodniczuk et al., 2004). Missed appointments or no-shows affect productivity of clinicians negatively as they wait for clients that never arrive (Stone et al., 1999) leading to burnout and high workforce turnover (Piper et al., 1999; Pekarik, 1985). Such inefficiencies tend to have the highest impact in resource-constrained settings (Zweben et al., 2008; Oldham et al., 2012), indicating the importance of integrating initiation and adherence strategies to treatment for AUDs (Mason and Luckey, 2003; Arnett, 2000; Smith et al., 2014; Choi et al., 2015; Schuman-Olivier et al., 2014).

Although lack of treatment and poor adherence has been shown to have a negative impact on illness severity and progression (Vogel et al., 2020), there has been a notable lack of focus on interventions aimed at enhancing initiation of and adherence to treatments for AUDs. Reviews conducted on the topic in the last ten years have either mainly focused on pharmacological treatments or examined adherence interventions targeting treatment of any kind of substance use disorder, not specifically AUD (Vogel et al., 2020; Dalton et al., 2021).

The primary aim of our review is to systematically examine the existing evidence on interventions targeting initiation of and adherence to treatment for AUDs. Specifically, our objectives are to (a) to synthesize evidence on the effectiveness of these interventions in improving initiation of and adherence to treatment for AUDs, (b) describe the core components (content) and delivery methods (Proctor et al., 2013) of these interventions, and (c) summarise the secondary impact of these interventions on clinical outcomes related to drinking and other measures of well-being.

2. Methods

This systematic review is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021). The protocol was registered a priori on PROSPERO (CRD42021266680).

2.1. Eligibility criteria

We included peer-reviewed research publications in English. There were no restrictions on geographical location or year of publication. Eligible study populations included people of any age, diagnosed with AUD and at any stage of help-seeking (eg: yet to seek help, undergoing detoxification, already seeking in-patient or outpatient treatment, seeking aftercare). In the case of studies involving a target population that included people who used other substances, they were included if 80 % or more of the sample used alcohol as the primary substance. Only randomized controlled trials (RCTs) and non-randomized controlled trials (nRCTs) were included. Initiation of and adherence to any kind of treatment was considered for the review i.e., medication or psychological, in-patient or out-patient or aftercare (eg: 12 Step Programs), individual or group, delivered independently or in combination with other treatments, and delivered in-person or via telecommunication technologies (e.g., tele-counselling). An intervention was eligible if it was designed and tested specifically for improving client initiation of and/or adherence to treatment for AUD.

Interventions not designed or evaluated to directly target client initiation or adherence, but which led to improved initiation or adherence as an indirect/secondary outcome or psychological treatments with initiation/adherence components within them, were excluded. Interventions designed or evaluated to target initiation/adherence to web based or digital psychosocial treatments, were excluded as such treatments are fundamentally different in nature from in-person or telephone delivered treatments (Lippke et al., 2021; Wang et al., 2000; Ludden et al., 2015).

We adapted WHO's definition of initiation and adherence to treatment as the extent to which a person's behavior corresponds to the treatment protocol, as mutually agreed between client and provider (Sabaté, 2003). The primary outcome of interest was any objective measure of treatment initiation or adherence to treatment including appointment attendance, homework compliance, and indicators of treatment adherence (such as uptake, engagement, motivation, utilisation, participation, completion, or retention) or nonadherence (such as treatment discontinuation, dropout, withdrawal, attrition, interruption, or premature termination). Secondary outcomes of interest were clinical outcomes related to alcohol use, mental health symptoms, wellbeing, disability, and quality of life, and implementation outcomes. See Table 1 for detailed inclusion and exclusion criteria.

2.2. Search strategy

Six electronic databases were searched: MEDLINE, PsycINFO, Embase, Global Health, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and the Cochrane Central Register of Controlled Trials (CENTRAL). The search was conducted in December 2023, using search terms under the following concepts: alcohol use disorders (e.g. alcohol misuse), treatment initiation/adherence (e.g. compliance, engagement), treatments (e.g. cognitive behavioural therapy, naltrexone), and controlled trial study design (e.g. randomised controlled trial). The detailed search strategy for MEDLINE can be found in Appendix A, and the search strategies for the other databases were a modification of this strategy based on the requirement of each database.

2.3. Study selection and data extraction

Search results from all electronic databases were merged and imported into EndNote X9 for removal of duplicates. After automatic and manual de-duplication, the remaining studies were imported to Covidence, an online software for managing systematic reviews. Papers were also manually screened for duplicates on the Covidence platform. Three pairs of reviewers (BB and SB, BB and AF, BB and MJ) independently screened 10 % of all titles and abstracts, while a single screener (BB) screened the rest of them. Full text screening for eligibility was done by one pair of screeners (BB and SB) and conflicts were resolved by a third reviewer (UB). For the title and abstract screening, consensus was reached for 93 %, 91 % and 95 % of publications for the three pairs of reviewers respectively. For the full text screening, consensus was reached for 91 % of studies.

Forward and backward citation chaining of included studies was conducted using Web of Science to find any additional eligible studies not identified through the database search. A data extraction form was developed a priori on MS Excel to collect data relevant to the objectives of this review. Data was extracted by one pair of researchers (BB and SB). Inter-rater reliability among raters for data extraction, as measured by Cohen's Kappa was 0.84.

2.4. Data analysis

Due to the heterogeneity in intervention content and outcomes evaluated in the included studies, a narrative synthesis was conducted (Popay et al., 2006). This involved a descriptive analysis of the studies included in the systematic review, using a textual approach to summarise and explain the results of the synthesis (Popay et al., 2006). Intervention components were categorised under common themes and the content and effectiveness outcomes were also described. Delivery methods, clinical outcomes and implementation outcomes were summarised under separate categories.

Table 1
Inclusion and Exclusion Criteria.

	Inclusion criteria	Exclusion Criteria
Study population	• Individuals of any age group experiencing AUDs and at any stage of help-seeking (eg: yet to seek help, undergoing detoxification, already seeking in-patient or outpatient treatment, seeking aftercare). • Persons will be eligible if they have been identified through one or more of the following: 1) ICD or DSM criteria; 2) clinician diagnosis; 3) already in treatment for drinking related issues; 4) positive screen on a standardized screening or diagnostic instruments • Participants with AUD or other unhealthy patterns of alcohol use either in isolation or in conjunction with another physical or mental health condition, including a different substance use disorder. • Studies that include participants with a mix of mental health conditions will be included if ≥80 % of participants meet our eligibility criteria.	• Studies that include participants with a mix of mental health conditions will be excluded if ≥80 % of participants do not report alcohol as their primary substance
Intervention	Interventions designed and/or tested to directly target treatment initiation or treatment adherence (as indicated by study authors, primary outcome or secondary outcome) to any treatment for AUDs.	Interventions designed/tested to target adherence to web- or mobile app-based psychological treatments
Comparison Group	Treatment as usual/usual care, another intervention, delayed intervention, wait-list control or enhanced usual care	
Outcomes	Objective measures of adherence to treatment as defined by the extent to which a patient complies with or completes treatment recommended by a health care provider. Outcome measures may include, but are not limited to: initial appointment attendance or completion (only valid measure for us to indicate treatment initiation), pill counts, electronic medication monitoring, appointment attendance, homework compliance, treatment uptake or treatment utilization, treatment engagement, motivation or participation, treatment retention, treatment completion or discharge	
Study design	• Randomized controlled trials • Non- randomized controlled trials	Observational studies, case studies, reviews, meta-analyses, commentaries
Setting	All settings globally	
Year	Any year	
Language	English	
Type of reports	Peer-reviewed articles	Grey literature

2.5. Quality assessment

The risk of bias was assessed using the Joanna Briggs Institute (JBI) critical appraisal tools relevant for the appropriate study design (Barker et al., 2023; Barker et al., 2024). It was used to evaluate the methodological quality and the possibility of bias in its design, conduct and analysis. To mitigate subjectivity in assessment, two reviewers (SB, BB) independently answered assessment questions and disagreements were discussed until consensus was reached.

3. RESULTS

3.1. Study characteristics

The 32 included studies comprised a total sample size of 76340 participants, and the sample sizes in the individual studies ranged from 12 to 71803 participants. All except one study were from high-income countries: United States (n=21), Denmark (Nielsen & Nielsen, 2018; Schwarz et al., 2019; Hellum et al., 2022), United Kingdom (Donoghue et al., 2023), Australia (Reid et al., 2005; Kavanagh et al., 2006), Germany (Bischof et al., 2016), Belgium (Pelc et al., 2005), Netherlands (De Wildt, 2002) and Norway (Vederhus et al., 2014). One study was from Brazil, an upper-middle income country (Moraes et al., 2010). Of the total, 29 were RCTs and 3 were nRCTs (Businelle et al., 2008; Pettinati et al., 2000; Schilling et al., 2002). 26 of the RCTs were individually randomized trials and three were cluster RCTs (Ossip-Klein et al., 1984, Acevedo et al., 2018, Hellum et al., 2022). Comparators or controls in the studies were usual care, enhanced usual care, another intervention, delayed intervention, or wait-list control. The characteristics of these studies are summarised in Table 2 and Appendix C.

3.2. Participant characteristics

The mean age of participants across the included studies ranged from 37.5 to 54.8 years. Recruited participants were either diagnosed with alcohol dependence on the Structured Clinical Interview for DSM III or DSM IV (n=14), ICD-10 (n=1), scored positive on the Alcohol Use Disorders Identification Test (AUDIT (n=2), scored positive on Composite International Diagnostic Interview 2.1 (n=1), were seeking outpatient treatment (n=2), were seeking inpatient treatment or detoxification (n=7), were referred from professionals or agencies in the community for a substance use disorder evaluation (n=2), or were individuals in a close relationship with someone who had a severe alcohol problem (n=4). With the exception of a few studies where all participants were females (Sisson and Azrin, 1986) or all participants were males (Ossip-Klein et al., 1984; Petry et al., 2000; Keane et al., 1984; Businelle et al., 2008), the proportion of female participants in the studies ranged from 5 % to 94 % with eight studies having a majority of female participants (60 % or more). For studies which reported information on race or ethnicity of participants (n= 22), only four had a 50 % or higher representation of ethnic minorities (African American, Hispanic or other populations). In the other 18 studies, Caucasian population constituted more than 50 % of the sample.

3.3. Interventions

Fourteen studies tested interventions involving principles of motivational communication between the delivery agent and the client (Moraes et al., 2010; Walitzer et al., 2009; Schwarz et al.,2019; Vederhus et al., 2014; Oslin et al., 2014; Nielsen & Nielsen, 2018; Schilling et al., 2002; Reid et al., 2005; Santa Ana et al., 2021; Kahler et al., 2004; Blondell et al., 2011; Carroll et al., 2001; Connors et al., 2002; Pettinati et al., 2000). Four studies (Ledgerwood et al., 2008; Petry et al., 2000; Donoghue et al., 2023; Businelle et al., 2008) tested interventions consisting of contingency management. Six studies tested interventions involving a concerned significant other (Bischof et al., 2016; Graff et al.,

Table 2
Summary characteristics of included studies.

Author, Year	Country	Study Design	Sample Size	Population	Treatment	Type of Initiation/ Adherence Intervention	Delivery agent	Control	Initiation/Adherence Outcomes	Secondary Outcomes
Acevedo, 2018	USA	Cluster RCT	71,803	Residential and detoxification agencies for substance use disorder treatment	Any treatment for AUDs	Arm 1: Alerts – weekly electronic reminders to "alert" staff about clients at risk of not meeting continuity criteria.Arm 2: Incentives - Agencies received quarterly incentives based on continuity of care ratesArm 3: Alerts and incentives	Automated	No alerts or incentives	No significant difference in continuity of care rates.	No difference in improvement of depression symptoms
Bischof, 2016	Germany	IndividualRCT	78	Concerned significant others (CSOs) of individuals with alcohol dependence	Any treatment for AUDs	CRAFT (Community Reinforcement and Family Training)	Specialists	Waitlist	Proportion of patients who entered treatment (3 months' time point)40.5 vs 13.9; p= 0.023	Impact of drinking on CSOs: Mental Health (MHI−5): 10.5 (4.2) vs 8.8 (4.6), 1.9 (0.74), p = 0.013 Relationship Happiness Scale: 34.9 (22.4) vs 27.6 (20.2), 11.1 (4.7), p = 0.021
Blondell, 2011	USA	IndividualRCT	138	Adults, DSM-IV diagnosis of alcohol abuse or dependence.	Aftercare sessions	Arm 1: Motivational interview.Arm 2: Visit from volunteers provided practical advice, encouraged action, and offered friendship and fellowship found in AA.	MET: Specialists P-TSF: Non-specialists	Usual Care	No significant difference in treatment initiation.	No difference between arms for relapse
Businelle, 2008	USA	nRCT	36	Veterans who have successfully completed SUD treatment	Aftercare sessions	Contingency Management: vouchers for negative drug screens and attendance	Mixed	Usual care	Proportion initiating treatment: 44.2 (15.2) vs 10.1 (16.9); p<0.001	No difference in improvement of anxiety symptoms
Carroll, 2001	USA	IndividualRCT	60	Adults referred for SUD evaluation	Any treatment for AUDs	Motivational Interviewing	Specialists	Usual Care	Proportion of participants who attended drug abuse treatment: 59.3 vs 29.2 (p =0.03).	Not reported
Conner, 2023	USA	IndividualRCT	400	Adults, Alcohol Use Disorders IdentificationTest (AUDIT) score ≥16	Any treatment for AUDs	Cognitive Behavioral Therapy-Treatment Seeking (CBT-TS)	Specialists	Pamphlet on AUD treatment	No significant difference in proportion of participants with any alcohol treatment use over 3-months	No significant difference for number of drinks per occasion and number of days abstinent in one month
Connors, 2002	USA	IndividualRCT	126	Adults, alcohol abuse	Individual and group therapy	Role induction interview	Specialists	Usual care	Number of sessions attended: MI vs no preparatory control:(M = 11.8, SD = 9.2) vs (M = 7.6, SD = 7.9), p < 0.05.	Heavy drinking days:(M = 3.5, SD = 6.7) vs (M = 11.8, SD = 9.2), p <0.01. Abstinent days: (M = 21.2, SD = 9.9) vs (M = 10.7, SD = 8.3), F (1, 113) = 118.8, p <0.01.
Dewildt, 2002	Netherlands	IndividualRCT	241	Adults, alcohol dependence	Acamprosate	Brief cognitive behavioral therapy group	Specialists	Usual care	No significant differences in medication adherence	Anxiety symptoms: −0.53 (0.63) vs. 1.25 (0.63), p <0.05

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Table 2 (*continued*)

Author, Year	Country	Study Design	Sample Size	Population	Treatment	Type of Initiation/ Adherence Intervention	Delivery agent	Control	Initiation/Adherence Outcomes	Secondary Outcomes
Donoghue, 2023	UK	IndividualRCT	518	Adults, alcohol dependence	Acamprosate	Arm 1: Standard treatment alongside medical management and contingency managementArm 2: Standard treatment alongside medical management	Non-specialists	Usual care	Proportion of medication taken:49.1 (3.7) vs 41.2 (4.1) vs 37.9 (2.7); p <0.05	No significant differences between treatment groups in abstinence, time to first relapse, psychosocial outcomes.
Galanter, (1984)	USA	IndividualRCT	235	Adults, alcohol dependence	Outpatient treatment for AUDs	Arm 1: Self-help peer therapyArm 2: Therapist led orientation meetings for aftercare	Non-specialists	No therapist or peer led orientation to aftercare.	Mean proportion of inpatients who made outpatient visits after inpatient discharge:(84 vs 63 vs52, p <0.02).	Not reported
Graff, 2009	USA	IndividualRCT	102	Adults, DSM III alcohol abuse or dependence	Counselling	Alcohol Behavioral Couple Therapy (ABCT)	Specialists	Alcohol Behavioral Individual Treatment (ABIT).	Number of sessions attended by participants in conjoint format was lower than control: 12.4 (6.4) vs 14.9 (6.5); p <0.05	Not reported
Hellum, 2022	Denmark	ClusterRCT	249	Adult females, DSM IV alcohol dependence or abuse	Any treatment for AUDs	Arm 1: CRAFT, individual sessions Arm 2: CRAFT, group sessions	Mixed (	Self-administered CRAFT by means of written material	No significant difference in proportion of patients who entered alcohol treatment	No significant differences between arms in quality of life and depression for the CSOs
Kahler, 2004	USA	IndividualRCT	48	Any individual with a close relationship to someone with AUD	Alcoholics Anonymous (AA) or 12 Step Self Help Groups	Motivational Interviewing.	Specialists	Brief Advice	No significant difference in mean percentage of days on which participants attended 12-step meetings	No significant difference in depression.
Kavanagh, 2006	Australia	IndividualRCT	163	Patients undergoing inpatient detoxification for alcohol dependence	CBT	Arm 1: CBT and cue exposure (CE) Arm 2: CBT and ECE	Specialists	CBT	Treatment completion rates:60 % vs 46 % vs 74 %, p < 0.02	No significant difference in alcohol consumption
Keane, 1984	USA	IndividualRCT	25	DSM IV alcohol abuse or dependence	Any treatment for AUDs	Arm 1: Contract/ recording Arm 2: Contract/ recording plus instructions for positive reinforcement:	Non-specialist	No contract/no recording	No significant difference in proportion of patients who were dispensed 3 months of Antabuse.	Not reported
Ledgerwood, 2008	USA	IndividualRCT	51	Patients ready for discharge from in-patient care for AUDs	Group therapy	Patients had chances to win prizes for coming to treatment.	Specialists	No contract/no recording	Mean proportion of sessions attended:80.4 % (21.7 %) vs 68.9 % (22.8 %);p <0.05	Not reported
Miller, 1999	USA	IndividualRCT	130	Patients entering treatment at drug-free (non-methadone) substance abuse clinics	Any treatment for AUDs	Arm 1: CRAFT Arm 2: Johnson Institute intervention. Control: Al-Anon	Specialists	Usual care	Proportion of patients initiating treatment (CRAFT vs Johnson vs Control): 64 vs 23 vs 13; p <0.001Proportion who initiated within 6 months: 64 vs 30 vs 13; p <0.001Proportion who initiated within 12 months: 67 vs 35 vs 20; p <0.001	Reductions in:a) Depression: 7.9 (8.1) vs 8.2 (7.2) vs 7.8 (8.5), p < 0.001b) Anger:11.3 (2.7) vs 11 (2.3) vs 11.1 (3.4), p < 0.002; c) Family conflict: 7 (2.4) vs 2.8 (1.9) vs 3.2 (2.3); p < 0.001

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Table 2 (*continued*)

Author, Year	Country	Study Design	Sample Size	Population	Treatment	Type of Initiation/ Adherence Intervention	Delivery agent	Control	Initiation/Adherence Outcomes	Secondary Outcomes
Moraes, 2010	Brazil	IndividualRCT	120	CSOs living with treatment refusing individual with DSM III alcohol abuse or dependence	Psychotherapy	Home visits, motivational interviewing	Mixed	An assessment followed by psychotherapy group sessions.	Proportion of patients dropping out: 14.5 vs 37.9; p=0.003	No difference between groups in alcohol consumption days
Nielsen & Nielsen, (2018)	Denmark	IndividualRCT	100	Treatment seeking, DSM IV alcohol dependence	Any treatment for AUDs	Motivational interviewing, 'attendance contract'	Non-specialists	Usual care	Proportion of patients initiating outpatient treatment 84.4 % vs 58.2 %, p=0.004	No difference in psychiatric or somatic hospitalization after treatment
Oslin, 2013	USA	IndividualRCT	163	ICD 10 alcohol dependence	Naltrexone	Alcohol Care Management (ACM)	Non-specialists	Usual care	Treatment engagement (Likelihood of attending two sessions at least) OR=5.36, 95 % CI (2.99, 9.59)	Likelihood of refraining from drinking over 26 weeks: OR=2.16, 95 % CI (1.27, 3.66)
Ossip-Klein, 1984	USA	ClusterRCT	100	DSM-IV alcohol dependence, anddrank greater than an average of two standard drinks per day inpast 60 days	Aftercare treatment program	Wall calendar with eight scheduled appointments, attendance contract	Mixed	Usual care	Proportion of participants attending session:Session 1: 72 vs 36; p<0.001 Session 2:60 vs 36; p<0.001Session 3: 56 vs 28; p<0.001 Session 4:68 vs 36; p<0.001Session 5: 48 vs 28; p<0.005 Session 6: 48 vs 16; p<0.001Session 7:44 vs 20; p<0.001	Not reported
Pelc, 2005	Belgium	IndividualRCT	100	Patients who had completed in-patient alcohol treatment program, and were assigned to aftercare	Acamprosate	Community nurse follow-up	Non-specialists	No-contract/no prompt	Treatment retention: 46 % vs 24 %; p <0.05	Abstinence: 32 % vs 16 %, <0.05Time to first drink: 81 days vs 67 days <0.05
Petry, 2000	USA	IndividualRCT	42	Undergoinginpatient alcohol detoxification	Out-patient treatment	Contingency management (Chance to win prizes for attending treatment sessions)	Mixed	Usual care	Treatment retention:84 % vs 22 % (p < 0.001)	No significant differences in percentage of participants reporting alcohol use by Week 8. Significant difference across arms in percentage of participants reporting relapse:26 % vs 61 %; p < 0.05.
Pettinati, 2000	USA	nRCT	100	Male veterans with alcohol dependence in intensive outpatient substance abuse treatment	Naltrexone	Motivational interviewing and medical management	Specialists	Usual care	Treatment attendance, across arms: 83 % vs 55.7 %, p < 0.001	Not reported
Reid, 2005	Australia	IndividualRCT	40	Alcohol dependence	Acamprosate	Compliance therapy	Specialists	Usual care	No significant difference in days taking acamprosate	Days to extended relapse: 84.1 (12.4) vs 38.4 (8.6); p= 0.02
Santa Ana, 2021	USA	IndividualRCT	118	DSM-IV alcohol dependence	Outpatient treatment	Group MI.	Specialists	Psychoeducational group based on CBT	Number of SUD treatment sessions attended: Rate Ratio = 2.53; 95 % CI [1.99, 3.22]	Binge drinking:Rate ratio =0.74; 95 % CI (0.58,0.94); p <0.01

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Table 2 (*continued*)

Author, Year	Country	Study Design	Sample Size	Population	Treatment	Type of Initiation/ Adherence Intervention	Delivery agent	Control	Initiation/Adherence Outcomes	Secondary Outcomes
									Number of 12-step sessions attended:RR = 1.64; 95 % CI [1.35–1.98]	
Schilling, 2015	USA	nRCT	96	Alcohol use disorder	Any treatment for AUDs	Motivational interviewing	Mixed	Usual care	Number of days spent in self-help groups (12 vs. 6, p <0.02).	Not reported
Schwarz, 2019	Denmark	IndividualRCT	561	Admitted to inpatient detoxification unit, alcohol is primary substance	Any treatment for AUDs	Motivational interviewing	Specialists	Usual care	Treatment attendanceOR = 4.9 (95 % CI 1.4–7.5); p = 0.015.	Psychiatric rehospitalizations at 1 year 0.2 (0.4) vs. 1.1 (0.99), p=0.03 Number of days spent in inpatient treatment at 1 year 1.9 (4.2) vs. 12.1 (13.3), p=0.03
Sisson, 1986	USA	IndividualRCT	12	AUDIT≥8, hospitalized for a minimum of 24 h.	Disulfiram	CRAFT	Specialist	Usual care	Treatment initiation:0 vs 6; x2= 5.49, p < 0.02	Significant difference in drinking between the two treatment conditions:- days drinking (F 1, 10 = 57.19), p <0.0001 - amount of ethanol (F 1, 10=31.01), p <0.0001 - days intoxicated (F 1, 10 = 18.75), p <0.0001
Stoner, 2015	USA	IndividualRCT	76	Family members of those with a severe alcohol problem	Naltrexone	Reminders to take the medication via SMS text messages.	Automated	Usual care	No significant difference in medication adherence between arms	No difference between groups for craving intensity and drinks per drinking day.
Vederhus, 2014	Norway	IndividualRCT	140	Current (past year) alcohol abuse or alcohol dependence	12 Steps group	Motivational intervention	Specialists	Standard detox	AA Affiliation Scale Score (2.47 (0.30) vs 1.56 (0.38); p=0.041	No significant difference in alcohol use severity across arms.
Walitzer, 2008	USA	IndividualRCT	169	Patients from detox unit	AA	Arm 1: Motivation interviewingArm 2: Directive Approach	Specialists	Usual care	Proportion of patients attending AA meetings:24.1 % (MOT) vs 24.5 % (DIR) vs 17.2 % (TAU); p <0.05	a) Percentage of days abstinent 32.1 (27.6) vs 38.8 (30.2) vs 35.7 (29.0); p <0.05 b) Percentage of days of heavy drinking 34.4 (31.9) vs 33.0 (32.6) vs 30.8 (32.4); p <0.05 c) DrInC: Drinker Inventory of Consequences total score 39.7 (21.5) vs 44.8 (24.2) vs 39.7 (21.6); p <0.05

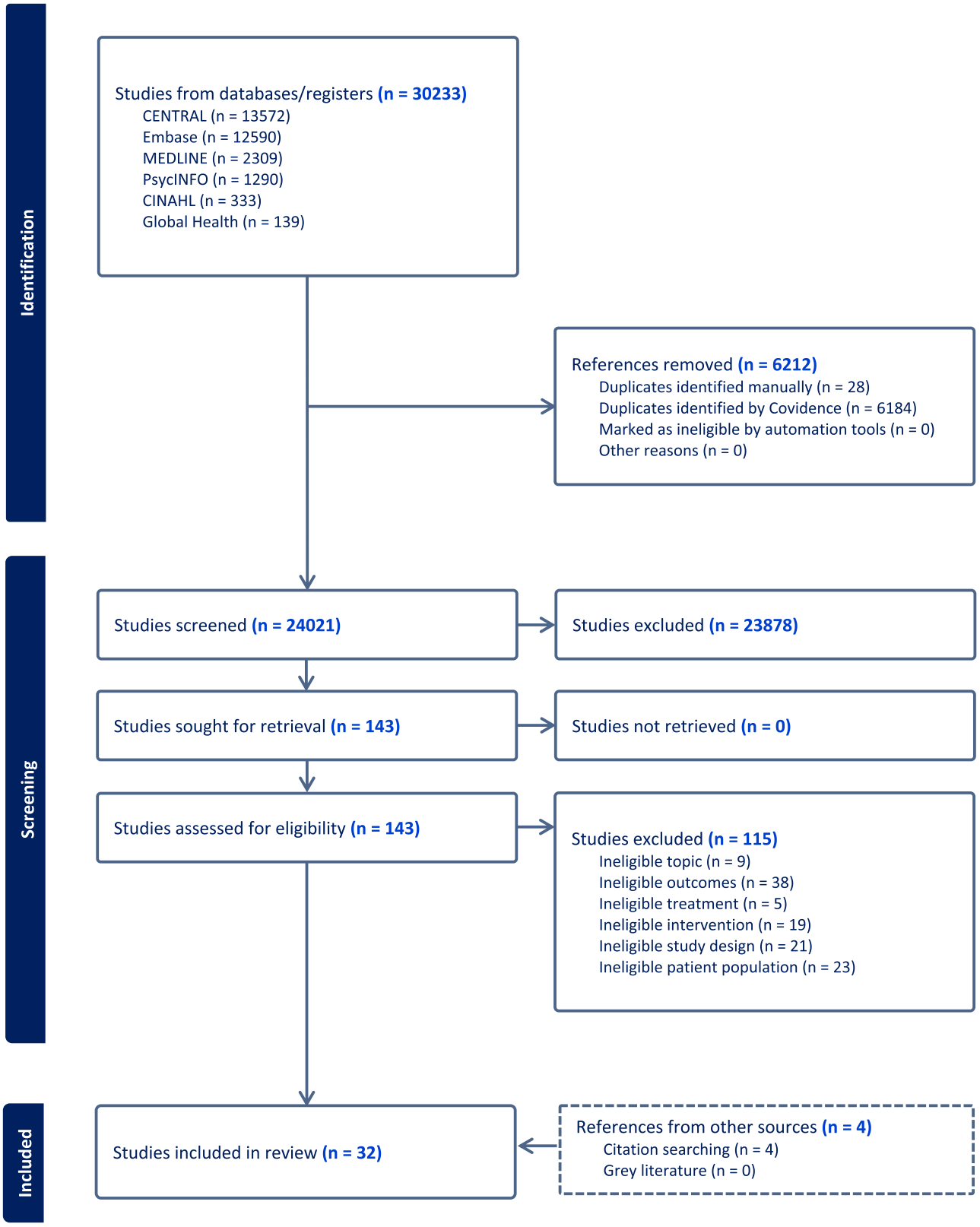

Fig. 1. summarizes the results of our search. Of the 30233 reports identified, 6212 were duplicates. From the remaining 24021 papers, 23878 were excluded at the title and abstract screening stage. In total, 143 full texts were assessed for eligibility and based on our criteria, 28 studies are included in this review. The forward and backward citation chaining process identified four additional eligible studies, leading to 32 studies being included.

2009; Sisson and Azrin, 1986; Miller et al., 1999; Hellum et al., 2022; Keane et al., 1984). Rest of the studies tested prompts and reminders (Stoner et al., 2015, Ossip-Klein et al., 1984), agency level reminders and incentives (Acevedo et al., 2018), follow-up (Pelc et al., 2005), cue exposure (Kavanagh et al., 2006), Cognitive Behavioural Therapy (Conner et al., 2023, De Wildt, 2002) and peer delivered facilitation (Galanter, 1984).

All except nine interventions (Kahler et al., 2004; Graff et al., 2009; Stoner et al., 2015; Acevedo et al., 2018; Kavanagh et al., 2006; Conner et al., 2023; De Wildt, 2002; Reid et al., 2005; Keane et al., 1984) were effective in improving at least one adherence outcome. 20 studies also reported a clinical outcome or a measure of well-being. 11 studies were effective in improving at least one clinical outcome related to drinking (Vederhus et al., 2014; Sisson and Azrin, 1986; Moraes et al., 2010; Connors et al., 2002; Reid et al., 2005; Santa Ana et al., 2021; Oslin et al., 2014; Petry et al., 2000; Donoghue et al., 2023 Walitzer et al., 2009; Pelc et al., 2005) and 4 studies were effective in improving at least one measure of well-being (Nielsen & Nielsen, 2018; Miller et al., 1999; Hellum et al., 2022, Bischof et al., 2016). Two studies reported implementation outcomes like acceptability, feasibility and fidelity. (Acevedo et al., 2018; Donoghue et al., 2023). All the intervention components and their effect on initiation/adherence outcomes are discussed in detail under relevant categories below and presented in Table 3.

3.3.1. *Interventions to enhance treatment initiation*

3.3.1.1. Motivational interviewing. To increase treatment initiation, seven studies (Walitzer et al., 2009; Schwarz et al., 2019; Vederhus et al., 2014; Nielsen & Nielsen, 2018; Schilling et al., 2002; Blondell et al., 2011; Carroll et al., 2001) tested interventions involving principles of motivational interviewing (MI), a guided counselling style that elicits behaviour change in clients by exploring and resolving ambivalence (Miller & Rollnick, 2002). Initiation strategies were delivered across different settings (inpatient, outpatient, community) and by diverse delivery agents (clinicians, nurses, social workers). Three of them intended to increase initiation of alcohol use disorder treatment and the rest intended to increase initiation of aftercare (e.g., 12-Step Groups [TSG]) for clients already receiving treatment for AUDs.

Five of these studies had specialists like therapists, clinicians or researchers with doctorates as delivery agents. In one study (Carroll et al., 2001), clinicians used MI techniques while conducting substance use evaluations during home visits, by helping participants understand the personal consequences of substance use, expressing empathy, and avoiding resistance. During similar outreach visits in one study (Schwarz et al., 2019), therapists from the alcohol treatment clinics offered a brief intervention (based on principles of MI) to clients dealing with alcohol use in addition to a brochure with information about the alcohol treatment. Two other studies (Walitzer et al., 2009; Blondell et al., 2011), involved therapists employing a motivational enhancement approach to encourage clients enrolled in out-patient (Walitzer et al., 2009) and inpatient treatment (Blondell et al., 2011) for attending AA meetings. In another study (Vederhus et al., 2014), clients undergoing standard detox received educational sessions employing MI principles to familiarize them with TSGs along with an opportunity to schedule appointments with AA volunteers to attend their first TSG meeting after detox.

Two studies (Nielsen & Nielsen, 2018; Schilling et al., 2002) tested interventions delivered by either non-specialists like nurses (Nielsen & Nielsen, 2018) or a mix of non-specialists and specialists (clinicians alongside licensed social workers) to initiate continued care or outpatient treatment after clients were discharged from inpatient detoxification. One of these studies (Nielsen & Nielsen, 2018) used a non-confrontational, client-centred manner of conveying information related to the treatment using techniques of MI to initiate alcohol treatment. They also presented the clients with an 'attendance contract', which stated the favorable impact on their prognosis of outpatient clinic attendance and options for attending the clinic (Lash and Blosser, 1999).

In the study by Schilling et al. (2002), the therapist and client collaboratively made a change plan following detoxification. Clients received guidance to anticipate potential obstacles to continued recovery, were informed about self-help groups, and were assured that the decision to attend treatment was solely theirs. The therapist encouraged the use of informal and formal support, helped identify high-risk situations, and supported the development of an inventory of such situations. A booster session was scheduled two weeks later to reinforce motivation. If a client was ambivalent, the therapist attempted to develop discrepancy between the client's minimizing of the need for change and the demonstrated impact of alcohol on their life, aiming to tilt the decisional balance toward problem recognition.

All of these interventions led to significantly higher proportion of people initiating alcohol treatment or AA/TSG meetings compared to the control (Table 2). Out of the four studies which reported clinical outcomes, one study each reported a greater decrease in drinking (Vederhus et al., 2014) and lesser hospitalizations (Nielsen & Nielsen, 2018) in the intervention arm.

3.3.1.2. Community Reinforcement and Family Training (CRAFT). Four studies (Hellum et al., 2022; Bischof et al., 2016; Miller et al., 1999; Sisson and Azrin, 1986) tested the CRAFT intervention (Meyers et al., 2001) designed to help family members of those with drinking problems to reduce their own distress, train them in methods that can increase the motivation of the latter to obtain formal treatment and also reduce their drinking. In three studies the intervention was delivered by specialists, with one study using a mix of specialists and non-specialists as delivery agents (Hellum et al., 2022). All were conducted with family members of the client in an outpatient setting and targeted initiation of any type of alcohol treatment. In the study conducted by Sisson and Azrin (1986), participants in the intervention group underwent awareness and motivation training, understanding the impact of their loved one's drinking on their lives. They were then taught to reinforce positive behaviors when their family member abstained from drinking and schedule enjoyable activities during times when heavy drinking was less likely to occur. Clients were encouraged to cultivate their own interests to reduce dependence on the person with substance use disorder, utilise communication strategies that can make them aware of their drinking, and hold them accountable for their actions. Training was provided for handling potentially dangerous situations, including violence. Recognizing moments of high motivation, clients were encouraged to suggest counseling. In studies by Miller (1999) and Bischof (2016), CRAFT was implemented with some changes. While the original procedures emphasized more on negative consequences and shame, the CRAFT procedures utilized in these studies focused on positive expectations and reinforcement. Furthermore, other adjustments were implemented, such as applying MI principles for awareness training and motivational enhancement, prioritizing the session on managing hazardous situations, and making CRAFT applicable to any treatment for AUDs, and not solely for medication adherence. In Hellum (2022), CRAFT in a group format and an individual format was tested against self-administered CRAFT (instructions in form of a brochure). All except one (Hellum et al., 2022) studies were successful in significantly increasing treatment initiation. While Sisson (1986) also reported significant improvement in drinking outcomes, the other two studies reported improvement in terms of relationship functioning (Miller et al., 1999) and CSO psychological outcomes (Miller et al., 1999; Bischof et al., 2016).

3.3.1.3. Other interventions. Five studies tested other interventions for treatment initiation. One was delivered by specialists (Conner et al., 2023), one was automated (Acevedo et al., 2018), two were delivered by non-specialists (Galanter et al., 1984; Blondell et al., 2011) and one by a mix of non-specialists and specialists (Ossip-Klein et al., 1984).

In one study in which the intervention was effective in improving

Table 3
Components and effectiveness of all included interventions.

Author Name, Year	Motivational interviewing	Contingency management	CRAFT	Prompts and reminders	Agency level Incentives	Contract	Cue exposure	CBT	Follow-up	Peer-deliveredand facilitated	Alcohol behavioural Couple Therapy
Acevedo et al., (2018)				X	X						
Bischof et al., (2016)			✓								
Blondell et al., (2011)	✓										
Businelle et al., (2008)		✓									
Carroll et al., (2001)	✓										
Conner et al. (2023)								X			
Connors et al., (2002)	✓										
Dewildt et al., 2002								X			
Donoghue et al., (2023)		✓									
Galanter, (1984)										✓	
Graff et al., (2009)											X
Hellum et al., (2022)			✓								
Kahler et al., (2004)	X										
Kavanagh et al., (2006)							X				
Keane et al., (1984)						X					
Ledgerwood et al., (2008)		✓									
Miller et al., (1999)			✓								
Moraes et al., (2010)	✓										
Nielsen & Nielsen, (2018)	✓					✓					
Oslin, 2013	✓										
Ossip-Klein et al., (1984)				✓							
Pelc et al., (2005)									✓		
Petry et al., (2000)		✓									
Pettinati et al., (2000)	✓										
Reid et al., (2005)	X										
Santa Ana et al., (2021)	✓										
Schilling, 2015	✓										
Schwarz et al., (2019)	✓										
Sisson and Azrin, (1986)			✓								
Stoner et al., (2015)				X							

(continued on next page)

Table 3 (*continued*)

Author Name, Year	Motivational interviewing	Contingency management	CRAFT	Prompts and reminders	Agency level Incentives	Contract	Cue exposure	CBT	Follow-up	Peer-deliveredand facilitated	Alcohol behavioural Couple Therapy
Vederhus et al., (2014)	✓										
Walitzer, 2008	✓										

Note: ✓ indicates that the trial testing this intervention component found it effective for treatment initiation or adherence **X** indicates that the trial testing this intervention component found it ineffective for treatment initiation or adherence

both initiation and adherence (Ossip-Klein et al., 1984), clients received a wall calendar with eight scheduled appointments over a 6-month period circled in red and completed an attendance contract which specified that the client agreed to the following terms: (1) posting the calendar in a prominent location; (2) attending aftercare; and, (3) calling the Alcohol Program at least one hour in advance of the scheduled appointment if unable to attend a session. Two studies involved peers in their interventions. In one study (Galanter, 1984), self-help programs involving orientation, therapy and activity groups were led by senior clients, often from the same ethnic group (under therapist supervision). The other study (Blondell et al., 2011) tested the Twelve-Step Facilitation Approach. Alongside standard treatment, clients received visits from volunteers who were in recovery from alcohol use disorders and familiar with making 12-step calls. The peers provided practical advice, encouraged the participant to take action, and offered the companionship and camaraderie found in AA. While the former (Galanter, 1984) was effective in increasing treatment initiation, the latter was not.

Other studies tested a brief, manualized and phone delivered session of Cognitive-Behavioral Therapy for Treatment Seeking (CBT-TS) which aimed to change beliefs that influence treatment entry (Conner et al., 2023) and agency level incentives and alerts to improve continuity of care rates (Acevedo et al., 2018). None of these studies were significant in increasing initiation of treatment.

3.3.2. *Interventions to enhance treatment adherence*

3.3.2.1. Motivational interviewing. Nine studies (Moraes et al., 2010; Oslin et al., 2014; Nielsen & Nielsen, 2018; Schilling et al., 2002; Reid, 2005; Santa Ana et al., 2021; Kahler et al., 2004; Connors et al., 2002; Pettinati, 2000) utilized MI principles to increase adherence to various types of treatment focused on AUDs. Five of them used specialists (psychologists) as delivery agents to increase adherence to medication (Reid, 2005; Pettinati, 2000), psychotherapy (Connors et al., 2002), outpatient treatment (Santa Ana et al., 2021) and Alcoholics Anonymous or 12 Step Self Help Groups (Kahler et al., 2004). For adherence to medication, one study (Reid, 2005) tested a compliance therapy consisting of five to six individual sessions based on motivational interviewing principles. Another study (Pettinati, 2000) combined medication management and motivational enhancement models to individualize and provide basic clinical care while monitoring pharmacotherapy. The essence of the method contained the components of expert assessment, educating the client about their AUD, supporting clients' efforts to change their drinking, and giving direct advice about taking medications and changing drinking behaviours. For adherence to outpatient treatment, one study (Santa Ana et al., 2021) employed group MI sessions. Unlike individual MI, therapists in group MI (GMI) promote group therapeutic factors (Yalom, 1995) including group cohesiveness, instillation of hope, universality, and identification. Two interventions focusing on psychotherapy adherence (Connors, 2002; Kahler et al., 2004) used MI principles to reflect on client goals regarding alcohol use and plans for successfully meeting these goals.

Two studies targeting adherence used non-specialists like nurses (Nielsen & Nielsen, 2018) or behavioural health providers (Oslin et al., 2014) while two (Moraes et al., 2010; Schilling et al., 2002) used a mix of specialists and non-specialists (therapists and social workers). In one of these studies (Moraes et al., 2010), nurses used the clinical style of MI, during home visits to promote adherence to psychotherapy. One of the two studies focusing on promoting adherence to outpatient treatment (Oslin et al., 2014) had participants meet weekly with a behavioural health provider (BHP) who assessed use of alcohol, encouraged treatment adherence, offered support and education, and monitored for new or worsening medical problems. In the other study (Nielsen & Nielsen, 2018), as described before, the outreach nurse educated the client on the importance of outpatient treatment following hospitalization while also presenting a 'attendance contract'. For adherence to TSG meetings, one study (Schilling et al., 2002) delivered two sessions of MI while the client was still in standard detox and one "booster" session delivered in the community two weeks post-discharge. All but two (Reid et al., 2005; Kahler et al., 2004) were effective in significantly improving at least one adherence outcome such as retaining higher proportion of clients in treatment (Moraes et al., 2010; Nielsen & Nielsen, 2018), improving treatment engagement (Oslin et al., 2014), higher session attendance (Santa Ana et al., 2021; Connors et al., 2002) and retaining clients for a longer duration in treatment (Schilling et al., 2002; Pettinati et al., 2000). Out of the six studies that also reported clinical outcomes, significant differences were reported between arms in terms of abstinence (Moraes et al., 2010; Connors et al., 2002) and reduction of drinking (Oslin et al., 2014; Santa Ana et al., 2021; Connors et al., 2002).

3.3.2.2. Contingency management. Four studies (Businelle et al., 2008; Petry et al., 2000; Ledgerwood et al., 2008; Donoghue et al., 2023) introduced an opportunity for clients to win prizes for attending treatment. One study involved clinicians as delivery agents to promote adherence to group therapy sessions (Ledgerwood et al., 2008), one involved the pharmacist as a delivery agent to promote adherence to acamprosate (Donoghue et al., 2023) and two others involved a mixed group of delivery agents to promote adherence to outpatient treatment (Petry et al., 2000) and aftercare sessions (Businelle et al., 2008). Contingency management strategies involved opportunities to win prizes (shopping vouchers, gift certificates, bus tokens) on attending sessions (Ledgerwood et al., 2008; Donoghue et al., 2023), providing negative blood alcohol concentration (BAC) samples or urine specimens (Businelle et al., 2008; Petry et al., 2000).

All four interventions were effective in significantly increasing at least one adherence outcome, like session attendance (Ledgerwood et al., 2008; Businelle et al., 2008), proportion of clients retained in treatment (Petry et al., 2000) and proportion of medication taken (Donoghue et al., 2023). One intervention each was also effective in reducing drinking (Petry et al., 2000), and increasing abstinence (Donoghue et al., 2023).

3.3.2.3. Other interventions. Nine studies tested other interventions to increase treatment adherence. Five of them were delivered by specialists (Walitzer et al., 2009; Connors et al., 2002; Graff et al., 2009; Kavanagh et al., 2006; De Wildt, 2002), two were delivered by non-specialists (Pelc et al., 2005; Keane et al., 1984), one was automated (Stoner et al., 2015)

while one was delivered by a mix of specialists and non-specialists (Ossip-Klein et al., 1984). In one study (Walitzer et al., 2009), therapists used a therapist-directed AA facilitation style consistent with Project MATCH (Project MATCH Research Group, 1998). Sessions included encouraging attendance at meetings, setting meeting goals, providing informative materials, involving significant others in Al-Anon, and emphasizing the concept of 'getting active' in AA. In another study (Connors et al., 2002), a preparatory role induction intervention was provided for adherence to psychotherapy. This was a 90-min interview that oriented the client with program components, conveyed treatment information, identified and encouraged "optimal client behaviors," and forewarned them of possible negative reactions to treatment. Both these studies were effective in significantly increasing session attendance. The former was also significantly effective in increasing abstinence, while the latter led to decrease in drinking days.

In one study (Pelc et al., 2005) clients undergoing inpatient detoxification were contacted by a community nurse once a week by telephone. The nurse was available by telephone 24 hours a day (seven days a week), conducted home visits, coordinated follow-ups at the hospital outpatient clinic and could accompany the client to these consultations if desired. This intervention was effective in improving treatment retention and abstinence.

Another study (Keane et al., 1984) provided clients with a standardized contract related to ingestion of disulfiram regularly, which was signed in presence of the spouse. Clients received additional instructions on the use of positive reinforcement, generated a list of feasible reinforcers, and were told to provide weekly reinforcement contingent upon compliance with the medication schedule. This intervention significantly improved medication adherence. Other studies tested cue exposure (Kavanagh et al., 2006), an adaptive and goal-directed Adherence Tracking intervention (Stoner et al., 2015), alcohol behavioural couples' treatment (Graff et al., 2009), and brief cognitive behavioral therapy for adherence to acamprosate (De Wildt, 2002). None of them were effective in improving adherence outcomes.

3.3.2.4. Risk of Bias. The majority of RCTs were of high quality, except for a few studies (Carroll and Hyland, 2013; Graff et al., 2009; Ledgerwood et al., 2008; Sisson and Azrin, 1986; Kahler et al., 2004; Keane et al., 1984) which were of moderate quality. The common areas of concern for studies were randomisation, allocation concealment, balance between arms related to participant characteristics and blinding of delivery agents.

The three nRCTs included in the review were of high quality. One study (Pettinati et al., 2000) lacked enough information to understand if the participants included in all comparisons were similar and if differences between groups in terms of follow up was adequately reported. The risk of bias assessments of all studies can be found in Appendix B.

4. Discussion

To our knowledge, this is the first systematic review to assess the existing research literature on interventions targeting initiation of, and adherence to treatment (pharmacological, psychological or integrated) for AUDs. We identified eleven groups of strategies that researchers have employed across various settings to improve initiation or adherence: Motivational interviewing, CRAFT, contingency management, prompts and reminders, cue exposure, agency level incentives, CBT, follow-up, peer-delivered and facilitated interventions, attendance contracts, and Behavioural Couple Therapy. The heterogeneity of how initiation/adherence outcomes were defined and measured, as well as the diversity in target population, follow-up periods, content, and delivery of interventions tested, prevent us from drawing substantive comparative conclusions about the effectiveness of specific types of initiation or adherence strategies. However, while we could not do statistical pooling of results, it is important to note trends related to the different interventions.

90 % of the studies that tested MI found it effective across settings and delivery agents, both in treatment initiation and adherence. It is interesting to note that when MI was employed for treatment initiation, it targeted the first few stages of change (precontemplation, contemplation, preparation) (Prochaska and Velicer, 1997). This approach focused on providing information, eliciting change, and preparing clients for treatment. On the other hand, adherence interventions, designed on the principles of MI, paid attention to the next steps for change as well (action, maintenance, relapse). Their approaches focused on preparing plans of change, observing and intervening in potential risk factors responsible for maintaining the client's addictive behavior, strengthening the existing protective factors that could help them maintain recovery, and addressing the "defensive'' attitudes of clients if necessary.

Research shows that MI helps provide an opportunity for clients to acquire information related to the treatment, set realistic expectations and evokes feelings of satisfaction and hope when those expectations are met in the process of treatment (Piper et al., 1999; Hoehn-Saric et al., 1964). Additionally, it reduces the apprehension and anxiety around treatment which may otherwise lead to counterproductive behavioural patterns like avoidance or resistance (France and Dugo, 1985). This might be important especially in treatment for substance use disorders where wrong beliefs and perceived fears related to treatment and low motivation are major barriers to treatment utilization (Farhoudian et al., 2022; Williams et al., 2018; Wolfe et al., 2023).

All studies except one testing the CRAFT intervention succeeded in increasing treatment initiation, in accordance with existing literature (Kirby et al., 2017). However, the potential for wider implementation of such a strategy in low-resource settings, particularly in LMICs, remains uncertain due to the absence of studies conducted in these contexts. The CRAFT intervention can be time intensive, requires rigorous training of the therapists and demands significant commitment from both the therapist and the family members to be delivered as intended (Smith et al., 2004). Moreover, the effectiveness of CRAFT is heavily contingent upon the level of family support available (Kirby et al., 1999; Kirby et al., 2006), with high dropout rates observed when family members feel overwhelmed or unable to meet the intervention's demands (Smith et al., 2004).

Contingency management was found effective for treatment adherence in the four included studies that tested it. The minimal training required for non-specialists to deliver these interventions suggests promise for scalability. However, contingency management strategies like voucher incentives have been criticised for being too costly (Bickel et al., 1997; Higgins et al., 1991, Higgins et al., 1993; Silverman et al., 1996, Higgins and Petry, 1999; Dallery et al., 2001) and studies have shown direct relationships between magnitude of reinforcement and drug abstinence (e.g., Silverman et al., 1997; Stitzer and Bigelow, 1983). Although the included studies reported expenditures of 60–100 dollars per client per month, further research can explore the scalability of such capital-intensive adherence strategies in resource poor settings.

We observed other patterns across interventions which show potential of working in a low resource setting. All but one single session interventions were effective (Nielsen & Nielsen, 2018; Carroll et al., 2001; Connors et al., 2002) and all of them involved MI. Out of the studies which had a non-specialist as a delivery agent, all but one were effective. All the studies with 50 % or higher ethnic minority population (Galanter, 1984; Pettinati et al., 2000; Businelle et al., 2008, Schilling et al., 2002) showed positive results, indicating that strategies like MI (with or without medical management), contingency management and peer delivered AA meetings can be generalizable and implemented in minority populations. A significant gap identified in this review is the lack of reported implementation outcomes in the studies reviewed, with only two exceptions. This gap makes it challenging to anticipate potential barriers and facilitators, plan implementation and examine generalizability of the interventions.

It is important to note that all the studies found in this systematic review tested interventions dealing with client-related factors of initiation or adherence. Relatively less research has been conducted on the other dimensions of adherence, like factors related to the social and economic status of the client, therapist characteristics, the severity and progression of the client's condition, presence of comorbidities, and the complexity and duration of treatment itself (Peh et al., 2021). The benefit of intervening in other dimensions can be seen in a limited number of studies included in this review. For example, Pelc (2005) involved a nurse who helped clients with follow-up and social support during treatment. In Galanter (1984), support throughout treatment was provided by senior clients of the same ethnicity, which could help the client in navigating identity related distress alongside other social barriers. Several such strategies working in parallel and targeting multiple dimensions of treatment initiation and adherence may work to improve client engagement in treatment. The implementation of multiple strategies parallelly also holds potential of better linkage to care after treatment referrals for patients experiencing AUDs. Reviews synthesizing studies (Glass et al., 2015; Jones et al., 2024) that tested the impact of screening, brief intervention and referral to treatment (SBIRT) on treatment utilization highlight for substance use disorders that while most studies employed effective interventions such as Motivational Interviewing (MI) techniques, successful linkage to care was often only achieved when additional support measures, like telephone monitoring and case management, were integrated.

There are a number of limitations to our findings and review process. A broad conceptualization of adherence inevitably means a heterogeneity of outcome measures, definitions of those measures, follow-up periods, delivery methods, intervention content, intervention duration, and treatments itself. While we believe this proved useful in illustrating the landscape of current evidence on the topic, we recognize this does not provide sufficient consistency for meta-analysis or definitive conclusions on the "most effective" strategy. We did not search grey literature, and publications in languages other than English, which may bias our results. The quality assessment of studies did not impact the weight given to them in the narrative synthesis. The sample sizes across studies varied significantly, with some included studies having as few as 12 individuals, which decreases the precision and generalisability of results. Finally, all studies included in this review were conducted in high-income or upper-middle-income countries. This limits the generalizability of our findings especially when differences in health systems and social and economic factors in LMICs may confound how similar interventions will exert their effects.

5. Conclusion

We expect our review to orient researchers, policymakers, clinic administrators, and client care providers to the array of interventions that have been tested to improve treatment initiation and adherence for AUDs. The eleven categories of interventions included in the review, significantly improved treatment entry, session attendance, treatment duration, and completion rate, and reduced dropouts. Additionally, many of these interventions also resulted in improvements in clinical outcomes. Integrating initiation and adherence strategies in AUD treatment services is crucial for enhancing treatment effectiveness and client outcomes. By incorporating these strategies into outpatient, inpatient and aftercare services, healthcare systems can better engage and support their clients, leading to better outcomes.

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CRediT authorship contribution statement

Bijayalaxmi Biswal: Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Radhika Anand:** Writing – review & editing, Writing – original draft. **Shruti Bora:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation. **Anisah Fernandes:** Writing – review & editing, Data curation. **Urvita Bhatia:** Writing – review & editing, Supervision, Project administration, Methodology. **Abhijit Nadkarni:** Writing – review & editing, Visualization, Methodology, Funding acquisition, Conceptualization. **Manjita Joshi:** Writing – review & editing, Data curation.

Declaration of Competing Interest

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Appendix A. Supporting information

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