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A Systematic Review of the Efficacy of Alcohol Interventions for Incarcerated People

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Keywords:	alcohol, criminal justice, efficacy, interventions

Table 1: Details of Included Papers from 11 Articles (9 studies)

Author (country); Study type	Setting (% male/female)	Age (ethnicity)	Follow-up period (follow up rates)	Alcohol screening used and cut-off used (who screened)	Intervention [number randomised]	Control [number randomised]
Brief Interventions						
Davis et al, 2003 (USA); RCT	Prison (97% male)	Mean 45.7 SD 7.7 (49% Caucasian; 38% African-American)	2 months (41%)	Form-90 alcohol tool (researcher)	1 session of MI (60 mins) [n=36]	TAU & information on local services [n=37]
Stein et al, 2010 (USA); RCT	Prison/Jail (100% female)	Mean 34.1 SD 8.9 (71% Caucasian; 19% African-American; 7% Hispanic)	1, 3 and 6 months (76%, 79%, 79%)	AUDIT 8+ (researcher)	2 sessions of MI (45-60 mins): Second session after the first follow-up [n=125]	TAU [n=120]
Begun et al, 2011 (USA); RCT	Local Jails (100% female)	Mean 35.7 SD 8.7 (57% African-American; 31% White; 6% Hispanic)	2 months post release (20%)	AUDIT-12 8+ (researcher)	1 session of MI (60-90 mins) [n=468]	TAU [n=261]
Stein, Clair et al, 2011 (USA); RCT	Juvenile Correctional Facility (86% male)	Mean 17.1 SD 1.1 (33% White; 29% Hispanic; 28% African-American)	3 months (86%)	Risk and Consequences Questionnaire- Alcohol (Researcher)	2 sessions of MI (session 1=90 mins; session 2=60 mins) [n=189 randomised, no breakdown given]	2 sessions of relaxation training (session 1=90 mins; session 2=60 mins)
Stein, Lebeau et al, 2011 (USA); RCT	Juvenile Correctional Facility (84% male)	Mean 17.1 SD 1.1 (32% Hispanic; 30% African-American; 30% White)				
Owens et al, 2016 (USA); RCT	Jails (100% male)	Mean age 34.4 SD 9.8 (27.5% Hispanic; 20% Native American/Alaskan Native; 17.5% African American; 7.5% Biracial/multiracial/other)	Between 1 & 3 months (63%)	ASSIST (Researcher)	1 session of MI (50-60 mins) [n=23]	1 session of educational videos (50-60 mins) [n=17]
Longer interventions						
Chance et al, 1990 (USA); Matched group	Prison (100% male)	Not given	30 weeks (68%)	Unsure (unsure)	6-18 months lifeline counselling (reality therapy & control theory) plus AA/ NA attendance & aftercare including AA/NA & family counselling [n=20]	TAU [n=40]
Baldwin et al, 1991 (UK); RCT	Juvenile Correctional Facility (100% male)	Mean 19.4; range 16.9-20.8 (no ethnicity given)	12 months (78%)	More than half of their total offences drink-related (Social worker)	6 sessions of MI (each session 120 mins) [n=14]	TAU [n=13]
Peters et al, 1993 (USA) matched group	Jail (74% male)	Mean 29 SD 7.5 (53% African-American; 44% Caucasian)	12 months (44%)	Addiction Severity Index (Program counsellors)	Cognitive-behavioural, skills based intervention over six weeks (three groups) 1. Special topics group re motivation & commitment; 2. Relapse prevention (1); 3. Relapse prevention (2) 27+ sessions [n=535]	TAU [n=422]
Bowes et al, 2012, (UK); RCT	Prison (100% male)	Mean 24.5 SD 5.7 (93% White)	Unclear (77%)	Alcohol-Related Aggression Questionnaire (unsure)	10 sessions covering selection of topics; 20 hours of group treatment, and 4 hours of individual support over four weeks (COVAID) [n=56]	TAU [n=59]
Bowes et al, 2014, (UK) RCT						

AA: Alcoholics Anonymous; MI; Motivational Interviewing; mins: minutes; NA: Narcotics Anonymous; TAU: Treatment as Usual

Table 2: Outcome Measures and Significant Results of Included Studies

Author	Outcomes (measures)	Significant results
Brief Interventions		
Davis et al, 2003	P: Engagement with services with VA substance abuse services (TSR) S: Contact with other substance abuse services (TSR) S: substance use (Form 90) S: Consequences (SIP) S: Addiction Severity (ASI) S: Readiness to change (Readiness to Change Questionnaire)	Those in the IG were statistically more likely to schedule appointments at both VA services with 60 days (66.7 vs. 40.5%; $X^2 = 5.01, p = 0.025$).
Stein et al, 2010	Drinking diary Alcohol use disorders (AUDIT)	Intervention effects on abstinent days were statistically significant at 3 months (odds ratio = 1.96, 95% CI 1.17, 3.30).
Begun et al, 2011	P: Engagement with substance abuse treatment services P: Level of reported alcohol use (AUDIT-12)	Mean reduction in AUDIT score from baseline to follow-up were greater in the intervention group ($F(1, 148) = 6.336, p < 0.001$).
Stein, Clair et al, 2011	Risk and consequences of drinking (RCQ-A) Depression (CES-D)	No significant results related to alcohol.
Stein, Lebeau et al, 2011	Alcohol and drug use (structured clinical interview for DSM-IV) Depression (CES-D) Alcohol use (TLFB)	No significant results related to alcohol.
Owens et al, 2016	Feasibility Pre-intervention motivation and confidence ratings IDPA to assess social networks ASI criminal and treatment history Alcohol and substance use Form-90	No significant results related to alcohol.
Extended interventions		
Chance et al, 1990	P: Sobriety (weekly urine sample) S: Changes in attitude towards self and others (self-perception profiles) S: Control over life (staff self perception profiles)	No significant results related to alcohol.
Baldwin et al, 1991	P: Drinking behaviour (MAST; SADQ) P: Offending behaviour (self-report) S: Wellbeing (General Health Questionnaire)	The IG reported less drinking in units per session than CG ($p < 0.05$). The IG had significantly less 'rules and regulations' offences than the CG ($p < 0.05$). The IG averaged fewer offences against the person compared to the CG ($p < 0.05$). The CG increased average number of alcohol units per week compared to the IG $F(1, 19) = 4.546$ ($p < 0.05$); The CG increased average alcohol units per drinking session compared to the IG $F(1, 19) = 6.753$ ($p < 0.05$). The IG reduced the average number of offences against property compared to the CG $F(1, 13) = 6.489$ ($P < 0.05$).
Peters et al, 1993	P: Recidivism (arrest data)	The IG had significantly more days free before arrest compared to the CG $t(418) = 3.0$ ($p = 0.01$). Significantly less arrests $t(418) = 2.7$ ($p = 0.01$). Significantly less jailed time served $t(418) = 2.4$ ($p = 0.05$).
Bowes et al, 2012	P: Alcohol related aggression (ARAQ-AA) S: Anger (STAXI-2) S: Impulsivity (IVE) S: Self-Efficacy (CSESES)	There were significant main effects of time, with lower scores at Time 2 for the following measures: ARAQ AA,

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		<p>$F(1, 87) = 4.81, p = .03, \eta^2 = .05$, CDESES OC, $F(1, 87) = 15.78, p < .001, \eta^2 = .15$, CDESES CCFC, $F(1, 86) = 20.88, p < .001, \eta^2 = .20$, CDESES NA, $F(1, 87) = 20.16, p < .001, \eta^2 = .19$, CDESES PM, $F(1, 87) = 5.92, p = .01, \eta^2 = .06$, CDESES quantity, $F(1, 86) = 4.81, p < .001, \eta^2 = .15$, CDESES frequency, $F(1, 87) = 11.37, p = .001, \eta^2 = .12$, total CDESES, $F(1, 86) = 25.14, p < .001, \eta^2 = .23$, STAXI-2 Anger Expression Out, $F(1, 86) = 10.69, p = .002, \eta^2 = .11$, STAXI-2 Anger Expression In, $F(1, 86) = 4.04, p = .05, \eta^2 = .05$, STAXI-2 Anger Control Out, $F(1, 86) = 4.42, p = .04, \eta^2 = .05$, STAXI-2 Anger Expression Index, $F(1, 86) = 12.57, p = .001, \eta^2 = .13$, and IVE I, $F(1, 87) = 16.77, p < .001, \eta^2 = .16$.</p> <p>There were significant Group \times Time interactions, with the COVAID group reporting significantly greater change scores in the desired directions on ARAQ AA ($\eta^2 = .05$), ARAQ Total ($\eta^2 = .05$), CDESES OC ($\eta^2 = .09$), CDESES CCFC ($\eta^2 = .11$), CDESES NA ($\eta^2 = .12$), CDESES PM ($\eta^2 = .04$), CDES Frequency ($\eta^2 = .07$), CDESES Quantity ($\eta^2 = .07$), CDESES Total ($\eta^2 = .14$), and the IVE empathy subscale ($\eta^2 = .04$).</p>
Bowes et al, 2014	Reconviction.	No significant results found.

P: Primary outcome S; Secondary Outcome; STAXI-2: State-Trait Anger Expression Inventory; IVE: Impulsivity, Venturesome and Empathy Scale; CDESES: Controlled Drinking Self-Efficacy Scale; ASI: Addiction Severity Index; IG: Intervention Group; CG: Control Group; RSQ-A: Risks and Consequence Questionnaire – Alcohol; TSR: Treatment Services Review; SIP: Short Inventory of Problems; P: Primary outcome; S: Secondary outcome; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, 4th. Edition; CES-D: Center for Epidemiological Studies - Depression; TLFB: Time Line Follow Back; AUDIT: Alcohol Use Disorders Identification Test; VA: Veterans Association; MAST: Michigan Alcohol Screening Test; SADQ: Severity of Alcohol Dependence Questionnaire; ARAQ-AA: Alcohol Related Aggression Questionnaire – Alcohol Aggression Scale; CDESES PM: Controlled Drinking Self-Efficacy Scale Positive Mood; CDESES CCFC: Confidence Controlling Frequency and Consumption; CDESES NA: Controlled Drinking Self-Efficacy Negative Affect; CDESES OC: Controlled Drinking Self-Efficacy Overall Confidence; IDPA: Important People Drug and Alcohol Interview

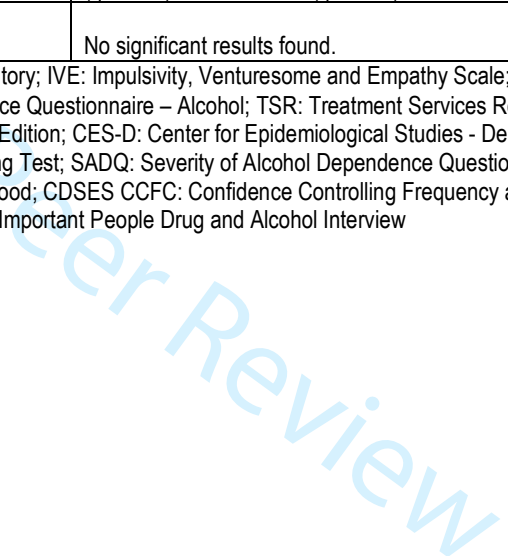


Table 3: Quality Assessment of Included Studies

Author	Did the trial address a clearly focused issue?	Was the assignment of patients to treatments randomised?	Were participants blinded?	Were the groups similar at the start of the trial?	Were the groups treated equally?	Were all participants accounted for at conclusion?	How large was the treatment effect?	How precise was the estimate of the treatment effect?	Can the results be applied in the local population context?	Were all important outcomes considered?	Are the benefits worth the harms and the costs?	Level of risk (quality assessment)
Brief interventions												
Davis et al, 2003	YES	YES	NO	NO	YES	NO	YES	YES	UNSURE	NO	UNSURE	HR
Stein et al, 2010	YES	YES	R: YES P: NO	YES	YES	UNSURE	YES	YES	YES	NO	NO	LR
Begun et al, 2011	YES	YES	NO	NO	YES	NO	YES	YES	UNSURE	NO	YES	MR
Stein, Clair et al, 2011 & Stein, Lebeaue et al, 2011	YES	YES	R: YES P: UNSURE	UNSURE	UNSURE	NO	YES	YES	NO	NO	YES	MR
Owens et al, 2016	YES	YES	NO	NO	YES	NO	NO	NO	NO	YES	NO	MR
Extended interventions												
Chance et al, 1990	YES	NO	NO	UNSURE	NO	NO	NO	NO	NO	UNSURE	UNSURE	HR
Baldwin et al, 1991	YES	YES	UNSURE	NO	NO	NO	YES	YES	NO	YES	YES	MR
Peters et al, 1993	YES	NO	UNSURE	NO	NO	NO	YES	YES	NO	YES	UNSURE	HR
Bowes et al, 2012 & 2014,	YES	YES	UNSURE	NO	YES	NO	YES	YES	NO	NO	YES	MR

R=Researchers. P=Participants. HR=High risk of bias. MR=Medium risk of bias. LR=Low risk of bias.

Table 4: TIDieR results of included Brief Intervention Studies

	Davis et al, 2003	Stein et al, 2010	Begun et al, 2011	Stein, Clair et al, 2011 & Stein, Lebeaue et al, 2011	Owens et al, 2016
Provide the name or a phrase that describes the intervention.	Brief MI	MI	MI	MI	MI
Describe any rationale, theory, or goal of the elements essential to the intervention.	MI based on work of Miller & Rollnick, 2002.	MI based on work of Miller & Rollnick, 2002.	MI based on work of Miller & Rollnick, 2002.	MI based on work of Miller & Rollnick, 2002.	MI based on work of Miller & Rollnick, 2002.
Materials: Describe any physical or informational materials used in the intervention. Provide information on where the materials can be accessed.	None given.	Manual was used.	Resource folder (including information about treatment, support services, housing, clothing, healthcare) and a 3-month calendar.	Handouts were given (e.g. goals chosen).	Manual that targeted alcohol & other drug use.
Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	Personalised feedback provided (pre-incarceration drinking rates relative to national averages, performance on neuropsychological tests compared to national averages, & ratings of physical & emotional health.) Participants were also given graphical information re: types of situations in which they reported commonly using substances, self-reported problems & dependence criteria endorsed, & their reported readiness for change. Interviewers were non-confrontational in tone, asked open-ended questions & used reflective listening skills. Interviewers allowed participants to come to their own conclusions, if any, about the feedback & need for treatment. VA referral information was reviewed at the end of the interview.	Initial session (during incarceration) - Interventionist used MI techniques re: goal setting & strategies to deal with obstacles/barriers that might affect these goals. Due to RIDOC regulations, participants were not allowed to keep any materials from the session. Upon release, the feedback report & change plan handouts, payment for the baseline interview, community resources, condoms & the next appointment date were mailed to participant. Follow-Up Session - Based on participant's goal(s) & change plan from initial MI session. Sessions focused on progress, assessment of barriers, & developing concrete strategies for meeting new goals.	Feedback intervention to engage the women in an exploration of their own motivation & commitment to behavior change. The objectives were to explore & resolve ambivalence, address decisional balance (the pros and cons of changing and not changing their substance-related behaviors), explore options (including self-change attempts, informal systems, & formal services), & resolve perceived barriers specific to engaging with substance abuse services.	MI focusing on empathy, not arguing, developing discrepancy, self-efficacy, & personal choice. Sections of the MI included developing rapport, exploration of motivation (pros & cons), personalized assessment feedback, imagining the future with & without change, & establishing goals. Focus of the intervention was on reduction of alcohol and/or marijuana use & associated risky behaviors & consequences of use (e.g., injuries while drunk or high).	MI session following a manual that targeted alcohol & other drug use, & if relevant, participants social networks & engagement in treatment. Open-ended questions elicited participants' reasons to change. Normative feedback was not included.
For each category of intervention provider, describe their expertise, background & any specific training given.	Clinical Research Staff who had completed/ were completing Masters Degrees. 12 hours of training in MI. Training: didactics & observed practices &		Graduate social workers trained in research protocol engaged women in initial demographic & brief screening interview.	Research counsellors delivered both type of intervention. Treatments were manualized & 20 hours training was given as well as weekly supervision.	Delivered by advanced clinical psychology graduate tutors who were trained in MI & had experience of delivering MI.

	experiences & supervision provided.				
Describe the mode of delivery of the intervention & whether it was provided individually or in a group.	One on one sessions.	One on one sessions.	One on one sessions.	One on one sessions.	One on one sessions.
Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	Private room in the jail	First session in prison (no details). Second session in hospital based community research site (no details).	Private room in the jail	Juvenile correctional facility	Private room at the jail that had windows to ensure the safety of study staff & participants but offered auditory confidentiality.
Describe the number of times the intervention was delivered & over what period of time including the number of sessions, their schedule, & their duration, intensity or dose.	One session of 60 mins per person.	Two sessions of between 30-45 mins per person.	One session of 60-90 mins per person.	One 90 minute session & one 60 min booster session.	One session of 50-60 mins per person.
If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when & how.	Personalised MI intervention based on results of screening.	Personalised MI intervention based on results of screening.	Personalised MI intervention based on results of screening.	MI: personalised intervention. RT: personalised as individual described relaxing place – individual to them.	Personalised MI intervention based on results of screening.
If the intervention was modified during the course of the study, describe the changes (what, why, when & how).	N/A	N/A	N/A	N/A	N/A
Planned: if intervention adherence of fidelity was assessed, describe how & by whom, & if any strategies were used to maintain or improve fidelity, describe them. & Actual: describe the extent to which the intervention was delivered as planned.	N/A	MITI was used to train & to monitor the MI skills of the interventionists during biweekly supervision. The MITI allows for assessment of threshold competence for therapists & a measure of integrity of MI interventions using two global scores (“empathy” & “spirit;” score range 1–7) & seven behavior counts (e.g. “giving information”, “MI adherent”).	N/A	Adolescents & research counsellors completed evaluation forms assessing whether core components of the interventions occurred.	Sessions were recorded for supervision with a certified MI trainer & to assess treatment fidelity.

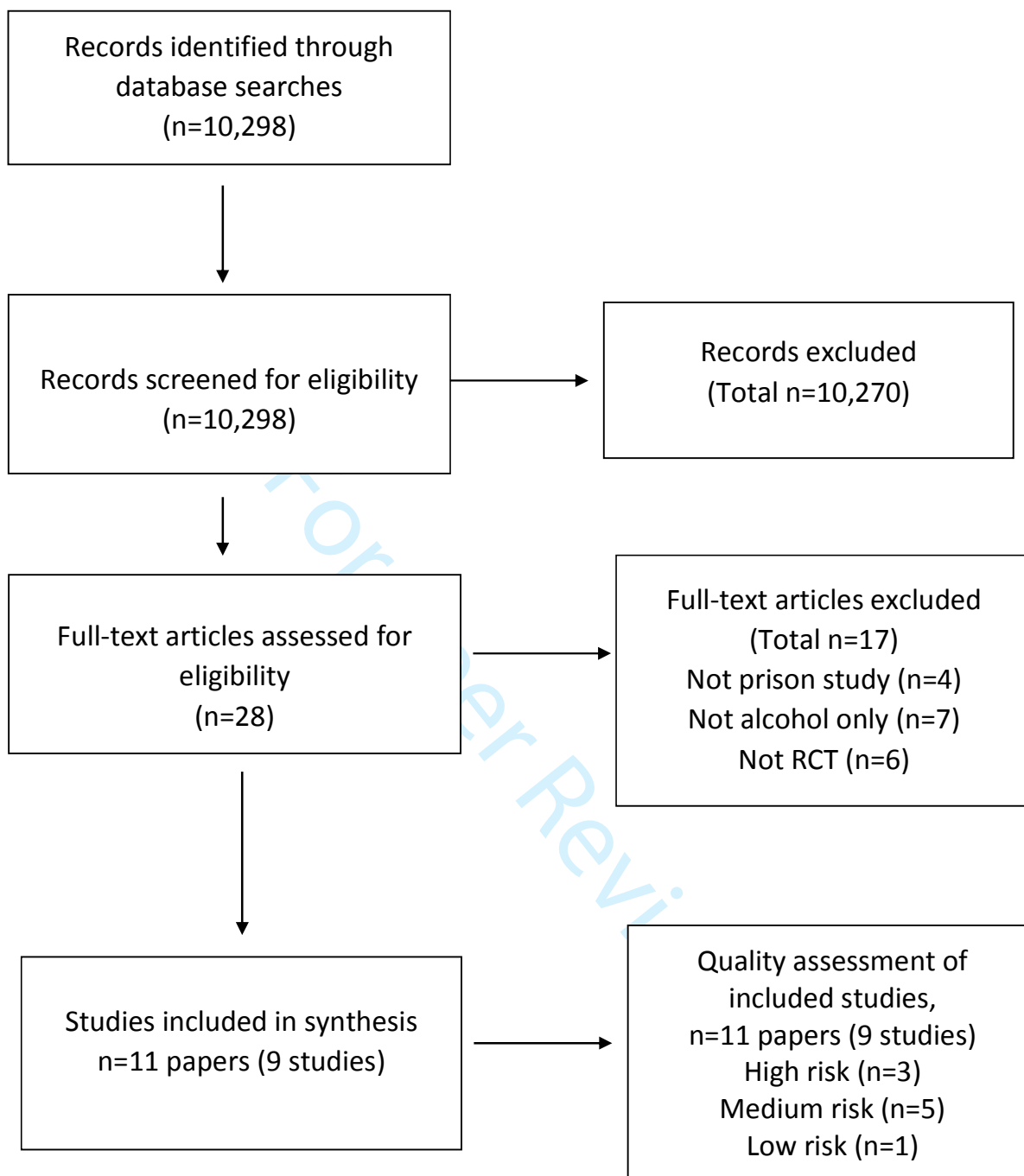
MITI: MI Treatment Integrity Code Version 2.0

Table 5: TiDieR Results of Included Extended Intervention Studies

	Chance et al, 1990	Baldwin et al, 1991	Peters et al, 1993	Bowes et al, 2012 & 2014
Provide the name or a phrase that describes the intervention:	Lifeline Drug & Alcohol Treatment Programme.	Alcohol Education Course (AEC).	In-Jail Treatment Programme.	COVAID.
Describe any rationale, theory, or goal of the elements essential to the intervention:	Reality therapy counselling	AEC similar to other behavioural AECs with the omission of context inappropriate material.	Cognitive behavioural, skills based approach that includes a focus on relapse prevention. Goals are to encourage long-term abstinence through prevention of lapse & relapse to substance abuse.	Cognitive behavioural treatment aimed at reducing alcohol related aggression.
Materials: Describe any physical or informational materials used in the intervention. Provide information on where the materials can be accessed	Inmates completed a weekly self-perception profile that addressed attitudes to oneself & others within program. Each participant kept a diary.	AEC materials.	None mentioned.	Manualised COVAID intervention.
Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	Weekly self-perception profile, individual counselling sessions & diary keeping.	Materials were presented so offender clients could acquire info/skills in reduced drinking/offending. Control group received nothing. MSI interview, follow up & collateral interview.	Three types of groups offered: 1. Special Topics Group - Focus on issues related to orientation to treatment (inc. motivation & commitment, ambivalence about adopting a drug-free lifestyle, family issues, shame & guilt associated with substance abuse, & health-related consequences of substance abuse). 2. Relapse Prevention – Level One. 27 sessions: two hours per day, five days per week. 3. Relapse Prevention – Level Two. For inmates who have completed Level One, Level Two groups focus on relapse prevention skills in greater depth.	The 10 sessions covered: explaining alcohol-related aggression, crime harm reduction, managing anger & stress, modifying drinking, altering triggers, weakening the expectancies that contribute to alcohol-related violence, identifying & coping with high-risk situations, & enhancing problem solving skills.
For each category of intervention provider, describe their expertise, background & any specific training given.	Director of program selected due to commitment to Lifeline & understanding of prisons. Other personnel given reality therapy training. Lead author was therapy certified & given ongoing training, as were inmates when they became peer counsellors.	Each worker (social worker, prison psychologist, teacher) had achieved criterion performance with the Motivational Screening Instrument.		Trained facilitators employed by the probation service or prison group work facilitators. Trained by Delight Training (www.delight.co.uk)

Describe the mode of delivery of the intervention & whether it was provided individually or in a group.	Individual & group counselling sessions as well as participation in self help programmes including AA.	Interviews (additional collateral interviews held with spouses/relatives/friend/drinking partners).	In groups of 8-12 people.	In groups of 8-10 people & individual sessions.
Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	N/A	N/A	N/A	N/A
Describe the number of times the intervention was delivered & over what period of time including the number of sessions, their schedule, & their duration, intensity or dose.	No pre-established length of time: ranged from 6 – 18 months.	6 weekly sessions of two hours.	27 sessions, 2 hours per day, 5 days per week. Level 2 then provides opportunity to focus on more. Average length of stay in program was 45 days.	20 hours of group treatment & 4 hours of individual support. Altogether 10 sessions.
If the intervention was planned to be personalised, titrated or adapted, then describe what, why, when & how.	Individual counselling with sessions personalised.	N/A	Inmates work to design a long-term recovery plan & to develop a balanced lifestyle through participating in drug free pleasurable activities.	4 hours of individual support – including looking at personal coping strategies
If the intervention was modified during the course of the study, describe the changes (what, why, when & how).	N/A	N/A	N/A	N/A
Planned: if intervention adherence of fidelity was assessed, how & by whom, & if any strategies were used to maintain or improve fidelity, describe them & Actual: the extent to which the intervention was delivered as planned	N/A	N/A	N/A	N/A

COVAID=Control of Violence for Angry Impulsive Drinkers



High risk of bias was recorded if 'no' or 'unsure' was recorded for six or more of the 11 questions on the tool. Medium risk of bias was assigned if 'no' or 'unsure' was recorded for 4-5 questions and low risk for 1-3 questions

Figure 1: Flowchart of data

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For Peer Review

A Systematic Review of the Efficacy of Alcohol Interventions for Incarcerated

People

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RUNNING TITLE: Systematic Review of the Efficacy of Alcohol Interventions for Incarcerated

People

KEY WORDS: Alcohol, criminal justice, efficacy, interventions

WORD COUNT ABSTRACT: 298

WORD COUNT TEXT: 3,863 excluding tables and references

ABSTRACT

AIM: The aim of this current study was to systematically review the literature on brief alcohol interventions for incarcerated individuals to ascertain the efficacy or effectiveness in making changes to either consumption of alcohol or other social outcomes.

INTRODUCTION: It has been shown that around three times as many incarcerated individuals are risky drinkers and alcohol dependency is ten times higher than in the general population.

METHODS: Systematic review of randomised controlled trials or matched group trials of the efficacy of psychosocial alcohol interventions for incarcerated individuals: we searched seven databases, with no restrictions on language, year, or locations from inception through to August 2017. The Critical Appraisal Skills Programme (CASP) tool was used to assess the quality of included studies. The Template for Intervention Description and Replication (TIDieR) checklist was used to ascertain intervention descriptions

RESULTS: Nine studies from 11 papers were included in the analysis. Six of the studies included brief intervention and three extended interventions. Every study used a different measure of alcohol consumption. Three of the studies that looked at brief interventions and all of the three extended intervention studies found significant reductions in relation to alcohol outcomes.

CONCLUSIONS: Results show that interventions in the prison setting have the potential to positively impact on alcohol use; however, because of small numbers and the use of

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3 different outcome measures we could not conduct a meta-analysis or generalise findings.

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5 Future studies are needed to standardise approaches to ensure greater rigour and efficacy.
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10 **SUMMARY**

11 Levels of risky drinking and dependency are high amongst incarcerated individuals. Eleven
12 studies from nine articles were included in the systematic review. Six of the studies included
13 brief intervention and three extended interventions. Interventions have the potential to
14 positively impact on risky drinking. More studies are needed in this setting.
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INTRODUCTION

Alcohol substantially contributes to the global burden of disease and is responsible for 2.3 million premature deaths worldwide, many of which are preventable (Rehm et al., 2009). A recent survey showed that 70% of prisoners in the UK admitted drinking when committing the offence for which they were imprisoned (Alcohol and Crime Commission, 2014). Hazardous drinking is a repeated pattern of drinking that increases the risk of physical or psychological problems (Saunders and Lee, 2000), whereas harmful drinking is defined by the presence of these problems (World Health Organisation, 1992). Drinking at hazardous or harmful levels are often categorised as risky drinking.

There are approximately 10.35 million people imprisoned worldwide. The United States of America (USA) has 2.28 million and the United Kingdom (UK) 85,843 (Walmsley, 2015). Worldwide, the prison population is 144 per 100,000 people; in the USA this is 698 per 100,000 people compared to 148 per 100,000 in the UK (Walmsley, 2015). It has been shown that drinking norms in the criminal justice system differ widely from those in the general population (Newbury-Birch et al., 2016b). Risky drinking is higher in the criminal justice system than in the general population (Newbury-Birch et al., 2016b). However, it has been shown that risky drinking amongst incarcerated people differs across the world. A systematic review carried out by Newbury-Birch et al in 2016 found that between 51% and 83% of incarcerated people are classified as risky drinkers (Newbury-Birch et al., 2016b); in the USA risky drinking levels have been shown to be around 50% (Binswanger et al., 2009); and in Africa the rates are shown to be just over 50% (Muigai, 2014). Furthermore, rates of dependence among those who are incarcerated have been shown to be up to ten times higher than the general population (Newbury-Birch et al., 2016b). Although the relationship

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3 is complex, there is well documented evidence of an association between alcohol use and
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5 crime (Boden et al., 2012), with a complex interplay between the amount drunk, the pattern
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7 of drinking, and the individual and contextual factors (Graham et al., 2012).
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11 Evidence tells us that intensive interventions that target high-risk offenders work best for
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13 reducing recidivism (Andrews and Bonta, 2010) and this is where resources are being
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15 placed. However, services are currently advocating the use of brief interventions in the
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17 criminal justice system (Newbury-Birch et al., 2016b). Brief interventions have been shown
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19 to be effective in primary health care (O'Donnell et al., 2014). They are typically applied to
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21 opportunistic, non-treatment seeking populations, delivered by practitioners other than
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23 addiction specialists (Miller and Rollnick, 2002). They are not simply traditional
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25 psychotherapy delivered in a short duration of time (Miller and Rollnick, 2002). Brief
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27 intervention largely consists of two different approaches (National Institute for Clinical and
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29 Health Excellence, 2010): simple structured advice which, following screening, seeks to raise
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31 awareness through the provision of personalised feedback and advice on practical steps to
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33 reduce drinking behavior and its adverse consequences; and extended brief intervention,
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35 which generally involves behaviour change counselling. Extended brief intervention
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37 introduces and evokes change by giving the patient the opportunity to explore their alcohol
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39 use as well as their motivations and strategies for change. Both forms share the common
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41 aim of helping people to change drinking behavior to promote health, but they vary in the
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43 precise means by which this is achieved. There is a wide variation in the duration and
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45 frequency of brief alcohol interventions, but typically they are delivered in a single session
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47 or a series of related sessions lasting between five and 60 minutes and can be implemented
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49 by a range of practitioners in a wide variety of settings (Kaner et al., 2007). To date there is
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3 a lack of evidence relating to the use of brief interventions in the criminal justice system in
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5 general, and in the prison system in particular (Newbury-Birch et al., 2016b).
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10 Intervening to reduce alcohol use has been shown to be cost-effective, generating both
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12 long- and short-term savings (UKATT Research Team, 2005). Therefore, given the high levels
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14 of risky drinking, the links between alcohol and crime, and the costs to society, it is
15
16 important to find effective interventions that not only reduce alcohol consumption but also
17
18 potentially recidivism. Interventions carried out within the criminal justice system could
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20 potentially capitalise upon the “teachable moment” considered to be conducive of
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22 behaviour change, wherein individuals can be encouraged to consider their alcohol use
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24 within the context of their offending behaviour and its punitive consequences (Babor and
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26 Grant, 1989).
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33 The aim of this current study was to systematically review the literature on brief alcohol
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35 interventions for incarcerated individuals to ascertain the efficacy or effectiveness in making
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37 changes to either consumption of alcohol or other social outcomes.
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41 42 **METHODS**

43 44 ***Search strategy and selection criteria***

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46 We carried out a systematic review of the international literature, following the Preferred
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48 Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines on
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50 reporting of systematic reviews (Moher et al., 2009). The systematic review protocol was
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52 registered on the PROSPERO Register at the University of York (CRD42016039895). We
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54 included Randomised Controlled Trials (RCTs) or matched group trials. As well as examining
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3 the efficacy/effectiveness of alcohol interventions, the current review adds to other reviews
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5 in the criminal justice setting (Graham et al., 2012, Newbury-Birch et al., 2016b) by including
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7 evidence around the timing of screening and interventions within the offender journey and
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9 information about the type and nature of the interventions themselves.
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14 We included studies with control groups comprising: treatment as usual; information-only;
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16 assessment only; no assessment; or another intervention. Studies eligible for this review
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18 were peer-reviewed trials of any alcohol interventions carried out in the jail/prison setting
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20 (including remand). We included interventions that were categorised as brief interventions
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22 as well as extended longer alcohol psychosocial interventions (extended brief
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24 interventions). We included individuals aged 16 years or over and any outcome measure.
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27 We excluded studies that included a drug and alcohol intervention where alcohol
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29 information could not be isolated.
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35 We searched: MEDLINE; PsychINFO; Web of Science; Cochrane Library; EBSCO; CINAHL; and
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37 the Campbell Collaboration Library. We included all dates in the search. The search was
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39 conducted in August 2017. Citations were scanned and we contacted experts in the field to
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41 minimise selection bias. The search terms used were: 'alcohol OR alcoholism OR alcohol
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43 abuse OR alcohol misuse OR binge drinking' AND 'crim* OR prison* OR offend* OR
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45 correctional OR penitentiary OR incarcerated OR remand' AND 'randomised controlled trials OR
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47 randomise OR control OR trial OR random* OR quasi* OR quasi* OR matched' with
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49 Boolean/phrase searches. Searches were tailored to the search functionality of each
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51 database. We also searched grey literature including google scholar and did a 360° citation
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53 check of included papers.
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5 All authors were involved in the data sifting. Two reviewers on the team conducted
6 eligibility assessments of titles and abstracts independently. Disagreements between
7 reviewers were resolved by consensus or by discussing with a third person. Data were
8 extracted into a Microsoft Excel spreadsheet independently by JF, EG, GM, SL and AH. These
9 researchers jointly reviewed the extracted data and all studies were double extracted by
10 DNB. Data were extracted on characteristics of trial participants, type and nature of
11 interventions (including content, duration, frequency, provider, setting), type of outcome
12 measure as well as information relating to the interventions itself. We used the Template
13 for Intervention Description and Replication (TIDieR) checklist to ascertain how
14 interventions are reported in the included studies (Hoffman et al., 2014). One researcher
15 completed the checklist (DNB) and it was checked by another (JF).
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32 **Quality assessment**

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34 The relevant screening tools from Critical Appraisal Skills Programme (CASP) were used by
35 one researcher (CG) and checked by another (DNB) (MKPC Trust, 2002). High risk of bias was
36 recorded if 'no' or 'unsure' was recorded for six or more of the 11 questions on the tool.
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38 Medium risk of bias was assigned if 'no' or 'unsure' was recorded for 4-5 questions and low
39 risk for 1-3 questions (Table 3).
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49 **Data synthesis**

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51 We grouped intervention content into two categories. The first was short interventions that
52 were categorised as brief interventions and included up to three sessions. The second was
53 extended brief interventions delivered over more than three sessions (Table 1).
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RESULTS

The search yielded 10,298 papers, of which 28 papers were fully assessed for eligibility (Figure 1). Eleven papers from nine studies were included in the final analysis (Baldwin et al., 1991, Begun et al., 2011, Bowes et al., 2012, Chance et al., 1990, Davis et al., 2003, Peters et al., 1993, Stein et al., 2011a, Stein et al., 2011b, Stein et al., 2010, Owens and McCrady, 2016, Bowes et al., 2014) (Table 1 and Table 2). Seven of the included studies were from the USA (Begun et al., 2011, Chance et al., 1990, Davis et al., 2003, Peters et al., 1993, Stein et al., 2011a, Stein et al., 2010, Stein et al., 2011b, Owens and McCrady, 2016) and two from the UK (Baldwin et al., 1991, Bowes et al., 2012, Bowes et al., 2014). The included studies consisted of 2,435 participants (range 27-729). Most of the studies included either all male participants (Baldwin et al., 1991, Bowes et al., 2014, Bowes et al., 2012, Chance et al., 1990, Owens and McCrady, 2016) or majority male (Davis et al., 2003, Peters et al., 1993, Stein et al., 2011a, Stein et al., 2011b). Only two of the included studies examined women only (Begun et al., 2011, Stein et al., 2010). Because of the heterogeneity of the studies meta-analysis was not possible.

FIGURE ONE HERE

TABLE 1 HERE

TABLE 2 HERE

TABLE 3 HERE

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3 Screening for inclusion for five of the included studies was carried out by researchers (Begun
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5 et al., 2011, Davis et al., 2003, Stein et al., 2011b, Stein et al., 2011a, Stein et al., 2010,
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7 Owens and McCrady, 2016); one by social workers (Baldwin et al., 1991) and one by
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9 program counsellors (Peters et al., 1993). Two studies did not include this information
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11 (Bowes et al., 2014, Bowes et al., 2012, Chance et al., 1990). A range of tools was used to
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13 screen participants into studies. Two studies used the Alcohol Use Disorders Identification
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15 Test (AUDIT)(Babor et al., 2001) screening tool to screen for risky drinking (Begun et al.,
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17 2011, Stein et al., 2010); one used the ASSIST (Owens and McCrady, 2016); one used the
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19 Alcohol-Related Aggression Questionnaire (Bowes et al., 2014, Bowes et al., 2012,
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21 McMurrin and Baldwin, 2006); one the Form 90 alcohol tool (Davis et al., 2003); one the
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23 Addiction Severity Index (Peters et al., 1993); one the risks and consequences of drinking
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25 questionnaire (Stein et al., 2010, Stein et al., 2011a, Stein et al., 2011b); one used the
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27 question 'more than half of their total offences being drink related' (Baldwin et al., 1991)
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29 and one did not give this information (Chance et al., 1990).
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39 **Brief interventions**

40 Five studies (six papers) from the USA examined the efficacy of brief interventions for
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42 incarcerated participants (Begun et al., 2011, Davis et al., 2003, Stein et al., 2011a, Stein et
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44 al., 2011b, Stein et al., 2010, Owens and McCrady, 2016). The length of the brief
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46 interventions ranged from 45 to 150 minutes (Begun et al., 2011, Davis et al., 2003, Stein et
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48 al., 2011a, Stein et al., 2011b, Stein et al., 2010, Owens and McCrady, 2016). One study (two
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50 papers) was from the same authors and included relaxation training as the control condition
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52 (Stein et al., 2011a, Stein et al., 2011b, Stein et al., 2010). One study included educational
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54 videos as the control condition (Owens and McCrady, 2016). The other studies all included
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3 treatment as usual as the control condition (Begun et al., 2011, Davis et al., 2003, Stein et
4 al., 2010). Studies did not give information on what treatment as usual was. Four of the
5 studies were conducted with adults (Begun et al., 2011, Davis et al., 2003, Stein et al., 2010,
6 Owens and McCrady, 2016) and one study with juveniles (Stein et al., 2011a, Stein et al.,
7 2011b) (Table 1). In terms of quality assessment, one of the studies was classified as having
8 a low risk of bias (Stein et al., 2010), three as medium risk of bias (Begun et al., 2011, Stein
9 et al., 2011b, Stein et al., 2011a, Owens and McCrady, 2016) and one as having a high risk of
10 bias (Davis et al., 2003) (Table 3).

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23 The five studies all used different outcome measures (Table 2), meaning results were unable
24 to be synthesised by meta-analysis, yet despite this, some significant results were found.
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26 Davis et al (2003) found that those that were given a brief intervention were significantly
27 more likely to schedule follow up appointments for treatment (66.7 vs. 40.5%; χ^2 5.01,
28 $p=0.025$) (Davis et al., 2003). Stein et al (2010) found that those in the intervention group
29 had reported significantly more days abstinent at follow-up (OR=1.96) (Stein et al., 2010).
30
31 Begun et al (2011) found that for the intervention group the mean reduction in AUDIT score
32 from baseline to follow-up were greater in the intervention group ($F(1,148)=6.336$,
33 $p\leq 0.001$) (Begun et al., 2011). The Stein et al (2011) study found no significant results related
34 to alcohol (Stein et al., 2011b, Stein et al., 2011a). Owens et al (2016) was a feasibility study
35 and although they found the study to be feasible they did not find any significant
36 differences between groups; however, the sample size was very small.

53 **Extended brief interventions**

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3 Four studies (five papers) examined the efficacy of alcohol interventions with adults in the
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5 prison system using extended brief interventions (Baldwin et al., 1991, Bowes et al., 2014,
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7 Bowes et al., 2012, Chance et al., 1990, Peters et al., 1993). Two of the studies were from
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9 the USA (Chance et al., 1990, Peters et al., 1993) and two from the UK (Baldwin et al., 1991,
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11 Bowes et al., 2014, Bowes et al., 2012). The interventions lasted from six sessions to 18
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13 months in duration (no actual times given). Three of the studies were conducted with adults
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15 (Bowes et al., 2014, Bowes et al., 2012, Chance et al., 1990, Peters et al., 1993) and one
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17 study with juveniles (Baldwin et al., 1991) (Table 1). In terms of quality assessment, one of
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19 the studies was classified as having a medium risk of bias (Bowes et al., 2014, Bowes et al.,
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21 2012) whilst three had a high risk of bias (Baldwin et al., 1991, Chance et al., 1990, Peters et
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23 al., 1993) (Table 3).
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30 The four studies all used different outcome measures (Table 2) meaning results were unable
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32 to be synthesised. Chance et al (1990) found no significant results related to alcohol (Chance
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34 et al., 1990).
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39 Baldwin et al (1991) found that the control group increased average number of alcohol units
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41 per week compared to the intervention group $F(1,19)=4.546$ ($p<0.05$); The control group also
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43 increased average alcohol units per drinking session compared to the intervention group
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45 $F(1,19)=6.753$ ($p<0.05$). In comparison the intervention group reduced the average number
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47 of offences against property compared to the control group $F(1,13)=6.489$ ($p<0.05$) (Baldwin
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49 et al., 1991).
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3 Peters et al (1993) found that those that were randomised to the intervention group had a
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5 significantly longer time period before being arrested again $t(418)=3.0$ $p<0.01$, significantly
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7 fewer arrests $t(418)=2.7$ $p<0.01$, and served significantly less jail time $t(418)=2.4$ $p<0.05$
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9 compared to the control group (Peters et al., 1993).
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14 Bowes et al (2012) found significantly lower scores for individuals in the intervention group
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16 compared to the control in relation to alcohol related aggression ($p<0.05$) as well as the
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18 different components of the Controlled Drinking Self-Efficacy Tool and the State-Trait Anger
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20 Expression Inventory (Bowes et al., 2012) (Table 2). However, a follow-up study by the same
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22 authors found no statistically significant differences in relation to recidivism (Bowes et al.,
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24 2014).
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30 **TIDieR results**

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32 Results relating to how interventions were described are shown in Tables 3 and 4 using the
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34 TIDieR checklist (Hoffman et al., 2014). We found that for some categories detailed
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36 information was not given in the included papers.
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41 **TIDieR results - brief interventions**

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43 All included studies described the brief intervention as being based on the motivational
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45 interviewing work of Miller and Rollnick (2002) with all papers giving some indication of
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47 what the components in the interventions were (Davis et al., 2003, Stein et al., 2010). All
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49 studies reported that interventions were given one-to-one and were based on the results of
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51 clients' individual screenings (Begun et al., 2011, Davis et al., 2003, Stein et al., 2011a, Stein
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53 et al., 2011b, Stein et al., 2010, Owens and McCrady, 2016). All studies were delivered by
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3 trained research staff, which calls into question how pragmatic the studies are and whether
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5 they could be implemented with fidelity in real life situations by existing program staff.
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10 None of the included studies gave information about modifications during the study and
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12 only two gave information related to fidelity (Stein et al., 2011a, Stein et al., 2011b), with
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14 one giving in-depth information in relation to the intervention development (Stein et al.,
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16 2010).
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26 ***TIDieR results – extended brief interventions***

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28 The four studies involving extended brief interventions were very different in content from
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30 the brief intervention studies (Baldwin et al., 1991, Bowes et al., 2014, Bowes et al., 2012,
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32 Chance et al., 1990, Peters et al., 1993). Intervention details in these studies were sparse,
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34 meaning that they would be unable to be replicated. The total amount of time spent in
35
36 intervention varied in length from a total of 12 hours (Baldwin et al., 1991) to 20 hours
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38 (Bowes et al., 2014, Bowes et al., 2012) to 54 hours (Peters et al., 1993). The remaining
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40 study stated that the time frame was 6-18 months but did not say how many sessions
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42 (Chance et al., 1990). Very little detail was provided about the information given during or
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44 as part of the intervention. According to the TIDieR checklist authors, this is the question
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46 that is least likely to be answered (Hoffman et al., 2014).
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53 None of the included studies gave any information relating to where in the prison the
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55 interventions took place or of any fidelity checks. However, unlike the brief intervention
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3 studies, all of the extended brief interventions were delivered by trained individuals
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5 employed within the services.
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14 **DISCUSSION**

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16 This systematic review examined the efficacy and effectiveness of alcohol interventions for
17 incarcerated individuals. Results show that it is possible to carry out randomised controlled
18 trials in this setting and that there is some promise in terms of effects. However, this study
19 has shown that, to date, not enough studies have been carried out to ascertain efficacy or
20 effectiveness and adequate methodological rigour in the available literature is
21 questionable.. Moreover, there is a distinct lack of information relating to female prisoners.
22 Yet this should not discourage researchers: the signs are that there is a place for
23 interventions in this setting and they do hold promise, but more robust studies are needed
24 with standardised approaches.
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40 This study, like others, has shown that interventions for offenders that tackle risky drinking
41 issues are under-developed and under-researched (Bowes et al., 2014, Newbury-Birch et al.,
42 2016b). It has also been shown that it is very difficult to conduct research studies in this
43 setting, primarily due to the difficulties in collecting self-report follow-up data (Newbury-
44 Birch et al., 2016b). One of the fundamental issues is that studies include different
45 measurement tools and outcomes, with outcomes decided upon based on the research
46 funding. A piece of work is currently taking place that aims to develop a Core Outcome Set
47 for Alcohol Brief Interventions to improve the measurement of alcohol-related change:
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3 Outcome Reporting in Brief Intervention Trials: Alcohol (ORBITAL) (Shorter et al., 2018).
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7 Furthermore, our results showed that interventions are not being described as methodically
8 as they could be and that is an area to further improve in future research. The introduction
9 of the TIDiER checklist (Hoffman et al., 2014) and the expectation that it will be used when
10 describing studies is a step forward; however, this study shows that, to date, there is limited
11 information relating to intervention content and delivery in this body of research.
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21 It is often thought that prisoners feel coerced into taking part in research projects; however,
22 evidence tells us that participants do not feel coerced if the project is explained properly
23 (Sherman et al., 2015). Although, research tells us that obtaining follow-up data with this
24 population is fraught with difficulties because of the sometimes chaotic lifestyles of the
25 participants (Newbury-Birch et al., 2016b). More work is needed into how we can use
26 routinely collected data in criminal justice studies. For instance, a recent study carried out
27 by researchers in the UK in the probation setting used reconviction data to follow up
28 individuals using Police National Computer identifiers and followed-up 97% of participants
29 (Newbury-Birch et al., 2014).
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44 In order for research to be applicable to the prison setting it is imperative that the
45 experiences of inmates are integrated in co-designing the research question and study
46 processes (Newbury-Birch et al., 2016a). By working together and drawing on the expertise
47 of staff, inmates and researchers, it is possible to translate the results of research into real
48 world practice (Sherman et al., 2015). For example, researchers in the UK have recently
49 undertaken an alcohol brief intervention (ABI) development study for male remand
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3 prisoners. As part of this, they have conducted in-depth interviews and focus groups with
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5 prisoners and prison staff/key stakeholders to develop not only the research process but
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7 also the type and nature of the ABI intervention (Holloway et al., 2017).
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12 There are several additional limitations to this study. The majority of the studies were
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14 undertaken in the USA and there was a lack of data relating to women. In addition, we were
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16 unable to complete a meta-analysis to quantitatively assess program outcomes because of
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18 the variability in outcome measures used in the studies. This review has shown that
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20 although there are limited studies it is feasible to carry out alcohol interventions with
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22 incarcerated individuals. More work is needed however, to clarify what exactly the
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24 outcomes of interest are to the criminal justice agencies we work with.
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31 Despite these recent developments the question remains: are we carrying out research
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33 projects for incarcerated individuals who are risky drinkers in the most effective way?
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35 Research studies in the criminal justice system are by their very nature complex and
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37 context-specific. Public health and criminal justice agencies have long been perceived as
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39 having entirely different approaches to dealing with alcohol issues (Shepherd and Sumner,
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41 2017). In order to advance policy development, research and program co-design, research
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43 highlights the need for more collaborative research partnerships developed at the start of a
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45 project to ensure program suitability and efficacy (Newbury-Birch et al., 2016a, Newbury-
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47 Birch et al., 2016b). Community-based participatory research has been shown to be a useful
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49 model for co-designing research with hard to reach groups (Leung et al., 2004). It has been
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51 argued that, in terms of informing policy, there tends to be an over-reliance on evidence
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53 from tightly controlled intervention trials which often lead to questions around the
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3 applicability of research in the real world (Pettman et al., 2012). The evidence to date,
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5 although limited does seem to be showing an effect. However, we are still at the stage
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7 where we need robust efficacy/effectiveness studies to prove whether the interventions are
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9 effective.
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11 12 13 14 **FUNDING SOURCE**

15
16 The research did not receive any specific grant from funding agencies in the public,
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18 commercial, or not-for-profit sectors.
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21 22 23 **CONFLICT OF INTEREST**

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25 No conflict declared.
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30 31 **CONTRIBUTORS**

32 Professor Newbury-Birch and Professor Aisha Holloway conceptualized the study,
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34 interpreted the results and critically reviewed the article. Dr Giles, Ms Ferguson and Dr
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36 McGeechan carried out the initial searches and with Professor Newbury-Birch, Dr Landale,
37
38 Dr Stockdale and Dr Gill screened articles, extracted data. Professor Newbury-Birch and Ms
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40 Ferguson carried out quality assessment. All authors critically revised the manuscript and
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42 approved the final version for submission. All authors have agreed to be accountable for all
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44 aspects of the work.
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