Table 1. Characteristics of Included studies

Author	Aim/Method/Design	Participants	Intervention/measurements/follow up	Data analysis	Results/Findings	Limitations/Notes
Bager et al. 2010 Denmark	Aim: To evaluate the effect of a brief intervention before and after discharge on the frequency of alcohol abstinence two months after discharge and to identify predictors of abstinence. Hypothesis: Alcohol-abuse intervention initiated before and maintained after discharge would increase the rate of alcohol abstinence at the 2 month follow up. Method: Quantitative Design: Randomised Controlled Trial. Power analysis at 90% identified 23 patients in each group with 75% abstinence in intervention group and 25% in control group.	Patients admitted to Aarhus University Hospital with alcohol-related health problems. Inclusion criteria: subjects drinking on a daily basis and express motivation for study participation. 25 participants in each group. Randomised by using 'closed envelopes' administered by an independent staff member.	Control group: received standard care Intervention group: MI for 2 months compared with a before and after discharge on the frequency of alcohol abstinence 2 months after discharge. Nurses and social workers were trained and experienced in MI. Measurements: Questionnaire similar to the Addiction Severity Index prior to randomisation. VAS to assess level of motivation. Blood samples measured drinking status. Follow up: 2 month follow up visit. 92% completed in the intervention group (n=23) and 88% in the control (n=22).	Chi-Square and Fishers Exact Test to assess the significance of difference in bivariate analysis. Baseline characteristics were assessed using unpaired *t* test and ANOVA	Results: 17 patients were abstinent for 2 months in the intervention group and 10 in the control group. Outcomes: There was no difference between the patients and the heal.th professionals' estimates of motivation for abstinence. Half the patients were assessed as highly motivated; half of this number was drinking at follow up. Brief intervention based on MI increased the post discharge alcohol abstinence at two months.	Limitation is that the two groups could not be blinded to the participants or the staff. Therefore difficult to determine whether it was the contact as opposed to the counselling that resulted in the differences found. Risk of the Hawthorne effect (placebo) as both groups were asked the same questions. Potential of information bias as alcohol use was self-reported. However, as there was no difference in blood sampling and reported usage in the first 14 patients this is unlikely.

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Britton et al. 2012 USA	Aim: To test the acceptability of motivational interviewing to address suicidal ideation (MI-SI) in veterans admitted to a psychiatric unit with suicidal ideation, estimate its pre-post effect size on the severity of suicidal ideation, and examine the rate of treatment engagement after discharge. Method: Quantitative Design: Prospective study	13 veterans were recruited from an acute inpatient unit between February 16 - August 11, 2010 Inclusion criteria: (a) Veteran status; (b) 18 years or older; (c) treated on unit; (d) English speaking; (e) able to give informed consent; (f) eligible to receive healthcare at the unit so they could return for follow-up; (g) clinically cleared to participate (e.g., not aggressive or violent); (h) having thoughts of suicide. Exclusion criteria: (a) current psychosis, (b) current mania, (c) dementia.	Intervention: Participants received a screening assessment, baseline assessment, one or two MI-SI sessions, post treatment assessment, and 60-day follow-up assessment. Measurements: The Beck's Scale for Suicidal. Ideation (SSI; Beck et al., 1979) Follow-up: Thirteen veterans were enrolled, 70% (n=9) completed both MI-SI sessions and the post treatment assessment, and 85% (n=11) completed the follow-up assessment.	Standard descriptive statistics were used to describe the sample To assess change in the severity of suicidal ideation, pre-post effect sizes were calculated using the standard formula for Cohen's *d*. Effect sizes were evaluated according to Cohen's guidelines for interpreting them as small (.20-.49), medium (.50-.79), or large (≥ .80).	Results: Preliminary findings suggest that MI-SI has the potential to reduce risk for suicide in hospitalised veterans with a psychiatric diagnosis. Participants found MI-SI to be acceptable. They experienced large reductions in the severity of suicidal ideation at post treatment and follow-up. In the 2 months following discharge, 73% of participants completed two or more mental health or substance abuse treatment sessions each month.	Small sample size so unable to generalize the findings. Lack of a control group is a major limitation. The post treatment SSI only assessed the past 48 hours – which may have impacted on the degree of change in suicide ideation. The clinician who developed the intervention was the primary clinician as well as one of the reliability coders – therefore clinician allegiance may have affected the outcomes.

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Forrester et al. 2018. UK	Aim: The study hypothesized that training social workers in MI will increase skills in practice and therefore increase parental engagement. A secondary hypothesis is that trained SW will demonstrate increased skills in MI. Method: Quantitative Design: Pragmatic Trial involving a between group comparison of social worker skills, parental engagement, and family outcomes. Randomised undertaken by the research team independent of the LA. Allocation was concealed behind sealed opaque sheets. Families were blind to allocation but SW and researchers were not. Those coding SW skills were blind to group membership	Undertaken in a London Local. Authority. 48 social workers and 12 line managers; 256 families. 28 received the intervention; 33 were in the control group. Families were randomised to trained SW (n=67) or untrained (n=98). Exclusion criteria: 1. Families who received 2 or fewer visits; 2. Families allocated to specialist SW teams: hospital, prison, homeless young people or young people without a carer; 3. Management over-rule; due to SW attrition or a family previously allocated to a SW. Families not included because the SW did not ask; parents not wanting to participate or researchers unable to contact families for follow up	Intervention: Social. Workers (SW) received the MI package Control: SW received no training in MI (received at the end of the study). Measurements: Family Interview Questionnaire; Working Alliance Inventory – measuring parental engagement; Goal. Attainment Scale; General Health Questionnaire; Life Rating Scale. Follow-up: 60% of intervention group completed the study (n=40); 62% of the control group (n=61)	Bivariate ANOVA, *t* tests and chi-square analysis.	Between group analysis was undertaken for the families in each group comparing number of children, proportion that were child protection and ethnicity – there was no significant differences. Statistically significant different in MI skills observed in SW in the intervention group. There was no significant difference in family engagement between the two groups (WAI) over the 6 month period. Concluded that the culture of the organisation may be more important than the training package (MI)	Families who did not take part in the study may have been different to those who did (recruitment/selection bias) Social worker attrition may have caused bias – although between group analysis did not identify any differences. Families were excluded who received less than 3 visits and it is possible that MI training may have affected the number of cases or the decision to close cases. Study was undertaken in one LA and may not be generalizable to other authorities.

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Kuerbis et al. 2018. USA	Aim: Hypothesis was that MI would emerge as a stronger predictor of reducing alcohol consumption when compared with Spirit Only MI (SOMI). Al.so that MI would be a stronger predictor of reduced drinking compared with SOMI when self-efficacy and confidence was low. Secondary analysis to test hypothesis that both MI and SOMI would predict reduction in drinking compared with Non-therapy condition in greater depressive symptoms Method: Quantitative Design: Study combining two previous RCT's to increase power.	228 problem drinkers with alcohol use disorder diagnosis (AUD) seeking help to reduce drinking Participants recruited in New York City. Eligible if: (1) aged 18 to 75; (2) average weekly consumption of ≥ 15 or 24 standard drinks per week during the prior 8 weeks; and (3) endorsed criteria for a current AUD. Excluded if they had: (1) another substance use disorder or were regular drug users; (2) a serious psychiatric disorder or suicide or violence risk; (3) clinical.ly severe alcoholism, history of serious withdrawal. symptoms; (4) were legal.ly mandated to treatment; (5) reported social instability (e.g., homeless); (6) expressed a desire to achieve abstinence; or (7) expressed a desire for substance abuse treatment	Intervention: Randomly assigned to one of three groups: A. MI – 4 sessions of psychotherapy over 7 weeks B. Spirit only MI - SOMI – change talk proscribed – also 4 sessions of psychotherapy C. Non Therapy Condition (NTC) – were encouraged to change on their own. Measurements: Completed Ecological. Momentary Assessment; Timeline Follow back Interview – covering period 9 weeks; Alcohol Use Disorder Identification Test (AUDIT); Beck Depression Inventory; Situational. Confidence Questionnaire (self efficacy). Daily commitment and confidence to resist heavy drinking (online survey).	Liner models for the dependent variable. Used SAS statistical software. Each moderator was tested independently: severity of baseline drinking; severe Alcohol Use Disorder; baseline self-efficacy to moderate drinking; mean daily confidence to resist heavy drinking; Depression.	Overall there was no significant difference in drinking behaviour between the 3 groups by week 8, which was unexpected. It is postulated that as the participants were confident that they could resist drinking that MI may not have been effective whereas if they were not confident, change talk would have been expected to show a difference. Secondary hypothesis was supported – a greater level of depressive symptoms interacted with therapy to facilitate a greater reducing in drinking. Depression had a mediating effect on confidence. MI's relational component may be important in increasing self-efficacy – reducing drinking in individuals with more than mild depressive symptoms.	Limitations: There were minor differences in the two studies – although evaluated as negligible. Only generalizable to problem drinkers with a goal of moderation – as this may be different to a goal of abstinence.

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Palm et al. 2016 Sweden	Aim: To analyse risk and binge drinking at 12-month follow-up in young women with risk drinking behaviour who received motivational interviewing compared with controls. Method: Quantitative Design: Randomised, parallel controlled intervention study. Conducted in four youth health centres in Sweden. Power analysis based on an assumption that 30% of women would report risk drinking and that 10% of women receiving MI would stop risk drinking. Needed 500 participants to achieve 80% power.	Alcohol misuse in young women, aged 15-22 years during the year 2012. Exclusion: Severe mental illness and non-attendance at regular school because of learning difficulties. 1051 women consented to the study (out of 1445). There were 86 men but due to the low numbers these were excluded. Randomised using a random allocation sequence, stratified by heal.th centre. Used sealed envelopes.	Intervention: Control Group – normal care Intervention group: Health dialogue with a midwife/social worker who asked questions about alcohol consumption using AUDIT-C. Practitioners received 30 hours of training in MI and feedback from supervisors on 1-2 of their audiotaped MI sessions. Measurements: Alcohol Use Disorders Identification test consumption Follow up: rate at 12 months was 54%.	Descriptive statistics. Categorical outcomes analysed using chi-square test and continuous outcomes using independent *t* test. Differences between the two groups were analysed using paired *t* tests.	Results: Concluded that risk drinking is not static in the 15 -22 age group. In this study MI did not reduce alcohol drinking in young women with high-risk behaviour. Both groups showed a significant decrease in binge drinking from baseline at 12 months. Reduction of 30% high risk drinking in intervention group but 41% in the control group. Of the participants who did not report risk drinking at baseline 22% in the intervention group and 20% in the control group developed risk drinking at 12-month follow-up.	It is a limitation that only 73% of eligible women agreed to participate – this may have been a recruitment bias as no data is available for the women who refused. Relatively high level of attrition may al.so be due to selection bias. However, the attrition levels were similar between the two groups. Results may not be generalizable across Sweden as the level of secondary education and the number of foreign background participants was dissimilar to Sweden as a whole.

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Pande et al. 2015 USA	Aim: Study hypothesized that successful engagement with a behavioural intervention would lead to improved use of health resources (reduced access) and lower health care costs Method: Quantitative Design: Retrospective observational study design that compared individuals who completed 7 weeks of an 8 week program with those that completed 2 weeks or less. Programme was delivered by telephone or secure video by a Licensed Clinical. Social Worker (LCSW) and behavioural coach.	552 participants. Study compared outcomes for participants who completed 7 weeks or more (n 251) with those that completed 2 weeks or less (n. 241). Inclusion criteria: 1. Were referred to the Cardiac Health program following a recent cardiovascular event; 2. Completed an initial consultation with a therapist; 3. Were enrolled with the care provider, Aetna, for 6 months before and after the intervention.	Intervention: An 8-week behavioural health intervention delivered by a licensed clinical social worker and a behavioural coach via phone or secure video included CBT, Acceptance and Commitment Therapy (ACT) mindfulness and MI. Measurements: Depression Anxiety Stress Scale 21 (DASS-21) Follow up: At 6 months pre and post intake criteria there were 80% (n=201) of participants in the intervention group and 75% (n=180) in the comparison group.	Descriptive analyses of baseline differences used *t* tests for continuous variables and Chi squared for categorical variables. Multivariable logistic regression was used for binary outcomes. Poisson or negative binomial multivariable regression was used for count data.	Results: Average age 56 years, similar portion of M:F and prevalence of comorbid clinical conditions in both groups. Participants in the intervention group had a significant reduction on severity of all components of the DASS-21 score. Intervention group had 38% fewer total admissions and 31% fewer hospital admissions which was statistically significant. A similar proportion in each group were hospitalized in the 6 month period but more individuals in the comparison group had multiple admissions. Findings: The intervention did result in statistically significant outcomes for the intervention group who experienced a reduction in all components of the DASS 21 and experienced fewer hospital and ED admissions/OPD visits.	The study included a range of behavioural interventions so it is difficult to extrapolate the significance of MI as this was combined with CBT, ACT and mindfulness.

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Russell et al. 2011 USA	Aim: To examine the feasibility and efficacy of a staff delivered motivational interviewing technique on treatment, diet medication and fluid adherence in adult patients receiving outpatient hemodialysis Method: Quantitative Design: Using a pre-test, post-test design pilot study	Convenience sample of 29 adult hemodialysis patients were recruited from a Midwestern non-profit, free-standing clinic. Inclusion criteria: 1. Age 21 or over; 2. Able to understand and communicate in English; 3. No cognitive impairment, determined by a score of 24 or above on the mini mental status exam; 4. Well enough to participate as determined by dialysis nurse manager.	Intervention: baseline data collected for 3 months. Participants received a 3-month, staff-delivered MI intervention during dialysis treatment. Staff trained on MI, had monthly coaching sessions three months prior to MI. Staff observed MI interactions, and had a development plan. Post intervention data for 3 months from medical records. MI continued for total period of 6 months. Measurements: Mini mental status exam; Interdialytic Weight Gain (IDWG); Serum phosphorous and albumin. National. Kidney Foundation dialysis Outcome and Quality Initiative outcome parameters; Health Care Climate Questionnaire Follow up: 3 months, 66% (n = 19) completed	Descriptive statistics for continuous and categorical variables. Wilcoxon signed rank test use to compare pre and post intervention adherence data	Results: Demographic characteristics similar to patients receiving dialysis in USA. MI favourably influenced dialysis attendance, phosphorous and albumin levels, but findings were not statistically significant. MI less favourably change in IDWG. Changes in HCCG scores were not statistically significant although the trend suggested improvement in autonomy support The MI intervention influenced dialysis attendance, shortened treatments, phosphorous and albumin levels favourably with less impact on Interdialytic Weight Gain (IDWG). Dialysis staff effectively delivered the MI intervention. Participants' perceptions of the MI intervention were highly favourable.	Using staff in the study could be a limitation as their competence levels were likely to vary. The study design limits the ability to determine causality; a lack of power limits the ability to detect a difference. Use of a single centre limits generalizability. There may be selection bias in that those who agreed to participate may have been different to those who didn't. Possibility of the Hawthorne effect – participants may have spontaneously altered their behaviour to please the researchers.

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Slesnick et al. 2013. USA	Aim: To test the impact of three substance abuse treatment interventions on internalizing and externalizing behaviours. Hypothesis 1) Internalizing and externalizing problems would be reduced in all treatments and 2) adolescents who received family therapy would maintain their reductions for a longer period of time compared with CRA and MI Method: Quantitative Design: Randomised trial. Method of randomisation not stated	179 substance abusing runaway adolescents recruited from a short-term runaway shelter in a large mid-western city. Inclusion: Aged between 12 – 17 years, had the legal option of returning home and had at least one parent/carer willing to participate in the study.	Intervention: Comparison of 3 psychotherapy interventions, Motivational Interviewing (MI), the Community Reinforcement Approach (CRA), and Ecologically-Based Family Therapy (EBFT). Researchers were trained over 2 days, weekly supervision and audiotape review. Measurements: Computerised Diagnostic Interview Schedule for Children (CDISC); (YSR) Child Behaviour Checklist (112 item scale) administered to the children Parents were administered the Child Behaviour Checklist Follow up: At 2 years was 77% (n=41) EBFT group; 68% (n=38) CRA group and 82% (n=46) in the MI group	Descriptive analyses using *t* test and ANOVA Paired *t* tests were used to compare differences between CBCL and YSR.	Results: All three treatments were associated with a significant reduction in internalizing and externalizing behaviours at 2 years. MI produced a faster rate of change compared to family systems therapy, but adolescents receiving family systems therapy continued to show reductions in mental. health problems at 24 months while adolescents in MI and CRA showed some increase in internalizing and externalizing by 24 months. Concluded that all three interventions showed clinical. improvement in symptoms over the two year period. Outcomes were measured longitudinal.ly over a two-year period to measure internalizing and externalizing behaviour scores.	Convenience sample so not generalizable to the general population. The adolescents and families who participated in the study may have been more motivated to change than those who refused.

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Smith et al. 2012 USA	Aim: Hypothesis: 1. That MI will not influence adherence to structural exercise sessions 2. That individuals with MS randomised to an MI intervention will report a better exercise experience marked by better affect during exercise, lower mental. and physical fatigue and lower perceived exertion when exercising. Method: Quantitative Design: Randomised Controlled Trial.	Individuals with advanced MS –13 were randomised, 7 to intervention, 6 to control. Inclusion criteria: 1. definite diagnosis of MS; 2. were relapse free in the previous 30 days; 3. had impaired mobility; 4. described themselves as not engaging in regular activity of 30 minutes or more on two or more days a week	Intervention: Three 30-60 minute sessions of MI; Control: was three 30-60 minutes of health coaching Participation in an 8-week exercise programme. MI was administered by a masters' level social worker who received 40 hours of training and weekly supervision. Measurements: 4 self-report measures – The Feeling Scale; Rating of Perceived Exertion Scale; Enjoyment Scale; Mental and Physical. Fatigue Scale were completed at the end of each exercise session. Follow up: No loss of participants to follow up. One of the intervention group did not complete the MI intervention.	Analysis of mean score and standard deviation using SPSS. Inferential analysis independent sample *t* tests on dependent measures. Analysis were replicated using nonparametric tests after removing outliers	Results: Interrater reliability high. The SW approached or exceeded published standards for competence in intervention but not in control group. No difference in attendance (MI v coaching) between each group, MI sessions were significantly longer than control group sessions. Of 6 main outcomes, 5 appeared to favour MI, but only 3 were statistical.ly significant: perceived exertion, affect and physical fatigue. MI group reported lower mental fatigue and higher enjoyment but not statistically significant**.** Concluded that using MI can result in improved exercise experience for people with MS.	Major limitation: small sample size. Need longitudinal studies to assess whether adherence is better at 3, 6 or 12 months. All participants experienced MI or a coaching conversation for the control group administered by one social worker increasing consistency of approach.

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Tibber et al. 2015 UK	Aim: Purpose of the intervention was to increase patients' motivation to change their patterns of substance misuse. Method: Quantitative Design: Quasi-experimental study pre/post test design without a control group.	Convenience sample of male patients detained under MH Act aged between 19-56 years. Risk factors – Patients with a history of substance (or polysubstance) misuse who also had a diagnosed MH disorder. Excluded if they had a history of violence or had absconded from the ward two weeks before their assessment. Also if they did not have the intellectual capacity to participate in the groups. Location: inpatients in a forensic service from secure wards	Intervention: Dual diagnosis intervention with 2 stages. Stage 1: 10 week psycho-education programme aimed to increase understanding of substance misuse, mental/physical health and offending behaviour using MI. Stage 2: 16 week programme, CBT skills to help change patterns of behaviour of substance misuse. Stage 3: 6-8 week programme – one to one sessions preparing for transition to community care Stages 1-2 in small groups of 6-8 men Measurements: Stage 1: 10 week psycho-educational. programme – self reported questionnaires: Alcohol and other drugs knowledge questionnaire (KNOW) Stage 2: Stage of change	Parametric statistics using *t* tests and multivariate analyses of variance (MANOVAs). Change ruler analyses using Wilcoxon Signed Rank tests.	Results: TMQ: No shift in stage 1 scores. Stage 2 significant effect of time point. Post hoc *t* test showed that the only significant shift was service users' external motivation for treatment. ECBI: Self-reported effectiveness of coping behaviours revealed no effect of time or difference at pre and post stage 2 scores. Findings: Stage 1 knowledge increased as a result of the intervention. However, this was not sufficient to induce a shift in attitudes. Stage 2: readiness to change did not shift during group participation. Main effect was an increase in external motivation for treatment. Concluded that this may reflect a more realistic evaluation of the challenges facing them.	Stage 3 not included so further studies should assess the efficacy of stage 3 as this is where MI would have its greatest effect.

			and treatment eagerness scale v5 (SOCRATES); Three change rulers; Treatment motivation questionnaire (TMQ); Effectiveness of coping behaviors inventory (ECBI) Follow up: Stage 1: 147 available service users; 54% (n=80) completed pre and post data sets, drop-out rate of 46% Stage 2: 53 available service users but only 71% (n=37) completed pre and post data sets – drop-out rate of 29% Stage 3: Not reported in this paper			

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Vos et al. 2011 The Netherlands	Aim: To evaluate the effect of a family based behavioural lifestyle intervention on markers of obesity, metabolism, inflammatory markers and physical fitness compared with standard care in this group. Method: Quantitative Design: Longitudinal, prospective, randomised clinical trial.	Obese children (as defined by Cole, 2000) aged 8 – 17 years who were referred to a paediatrician. Stratified by age (8- under 12 and 12 to under 17), gender and ethnicity. Exclusion criteria: insufficient Dutch language, intelligence of social skills (not defined); medication that may affect weight loss, medical co-morbidity. 41 children were randomised to the intervention and 40 to the control group Paediatric clinic within a Children's Hospital.	Intervention: Individual counselling of the child with parents. Intensive phase of group sessions over three months (7 meetings with the children (2.5 hours long, fortnightly); 5 with the parents, 1 meeting with parents and children. A 2 year follow up session - 2-3 times a year – was offered for 2 years in total. Control Group: received standard care and advice at the start of the trial on how to increase physical activity. Measurements: Weight, BMI, Waist circumference and blood pressure. Voluntary maximal exercise test to assess physical fitness. Biochemical blood tests: Glucose, plasma insulin, insulin resistance, HDL cholesterol Triglyceride CRP, Adiponectin level	Descriptive statistics expressed as means and standard deviation. ANOVA for comparison with intervention group. Pearson correlation analysis for baseline study parameters.	Results: Adiposity significantly reduced in the intervention group at 3 months and 1 year. BMI reduced by 10% and WC by 19% Blood pressure decreased in intervention group, no change in control. Physical fitness significantly improved in intervention group. No change in fasting insulin and lipid profile. Findings**:** That a multidisciplinary lifestyle intervention demonstrated beneficial results in reducing body weight, improving fitness levels, nutritional habits and coping strategies (although after 2 years the children did not manage to reduce their body weight to a normal. range). Whilst parents were involved in this study, an issue was their unrealistic expectations of weight loss. Therefore it is important	Participants were referred to the study so may have been subject to selection and referral bias – therefore the children may not be representative of severely obese children in the general population. Method of randomisation was not stated.

			Follow up: 3 months: I – 88% (n=36); C – 82% (n=33) 1 year: I - 78% (n=32); C – 87% (n=35) 2 years: I – 76% (n=31) The control group did not continue into year 2 as they were offered the intervention at this time. Normative data for physical fitness and metabolic processes was collected from a group of 34 healthy children with a normal body weight, matched for age, gender and ethnicity.		to maintain motivation with parents and children after the initial interview to encourage maintenance of the newly learned lifestyle.	