Motivational interviewing to enhance treatment attendance in mental health settings: A systematic review and meta-analysis

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Abstract

Introduction

The stages of change model suggests that individuals seeking treatment are in the "preparation" or the "action" stage of change, which is the desired outcome of successful Motivational Interviewing (MI) interventions. MI is known to enhance treatment attendance among individuals with mental health problems.

Aim

This study examined the published research on MI as a pre-treatment to enhance attendance among individuals treatment-seeking and non-treatment-seeking for mental health issues.

Methods

Fourteen randomized controlled trials were identified, and MI efficacy was examined dichotomously: attendance or non-attendance for post-MI therapy. Subgroup analysis investigated treatment-seeking and non-treatment-seeking groups.

Results

Despite wide variations in sample sizes, blinding and monitoring, intervention fidelity was absent in the majority of published studies. Meta-analysis revealed that MI pre-treatment improved attendance relative to comparison groups.

Conclusions

Individuals not seeking treatment for mental health issues benefited the most from MI. Despite differences in MI treatment intensity, short interventions were as effective as longer interventions, whereas two MI sessions for as little as 15 min were effective in enhancing treatment attendance.

INTRODUCTION

Worldwide, the impact of mental illness and substance abuse is substantial and accounts for over 7% of the total disease burden (Becker & Kleinman, 2013). These conditions represent the fifth leading disease burden and the leading cause of nonfatal disease burden (Whiteford et al., 2013). Despite common disorders such as depression and anxiety being treatable and possibly preventable (Gulliver et al., 2012), a large proportion of individuals do not receive the care required for their condition (Becker & Kleinman, 2013), and from 2011 to 2030, mental illness is projected to cost $16 trillion globally (Bloom, et al. 2011).

In high-income countries such as Australia, mental illness is the third leading cause of total disease (12%) and is the main contributor (24%) to nonfatal disease burden (AIHW, 2016). Almost half (7.3 million) of the Australian adult population has experienced a mental illness some time in their life (ABS, 2009). In 2007, the Australian National Survey of Mental Health found the prevalence of mental illness in the community to be unchanged since 2002, as was the perceived need for treatment, and there were no changes in access to treatment (Tankel et al., 2011). More recent Australian studies indicate that among those currently experiencing mental illness (mostly affective disorders such as depression), only around 35% sought assistance mainly via community-based health service providers (AIHW, 2015). However, these data reflect service utilization, rather than the perceived need for treatment. Of those that did not seek treatment for a mental illness, 86% reported that they did not need any help with their mental well-being (AIHW, 2015). In the United States, mental health services were also underutilized and in 1997, unmet need involved 4.3 million individuals and rose to 7.2 million individuals in 2011 (Roll et al., 2013). In regard to the burden caused by mental illness in the United States, it is the single largest contributor to disability, representing 20% from all causes (Roll et al., 2013).

Currently, there are many individuals who are not seeking or receiving help for their mental health condition and this may not necessarily be problematic. There are individuals which currently experience mainly self-limiting conditions which they believe can be appropriately managed themselves, without the need for any medical treatment (Wang et al., 2005). However, lack of treatment seeking may be indicative of something more serious than just a low perceived need and the desire for self-management (Lawrence & Fulbrook, 2012). Sometimes, an individual may delay seeking treatment for years and even decades (Wang et al., 2005). Early onset cases occurring in childhood have particularly long treatment delays because children need their parents, teachers, and other adults to initiate the referral process, which may or may not happen (Christiana et al., 2000). There are also differences in cultural groups in their willingness to report mental illness and engage in treatment (Bhui et al., 2007; Hernandez et al., 2009; Knifton, 2012; Saxena et al., 2007).

One must also take into consideration that mental illnesses, like physical disorders, differ widely in both severity and need for treatment. There are individuals within the community who are suffering at subthreshold levels of psychological distress. Subthreshold symptoms of psychological distress have a smaller impact than serious mental illness, but are still significant when compared to individuals not experiencing psychological distress (Batelaan et al., 2007; Grenier et al., 2011; Karsten et al., 2013; Rodríguez et al., 2012), and impact on health is comparable (Cuijpers et al., 2013). However, distress levels are also a barrier to treatment seeking, where lower distress results in lower perceived need for treatment (Andrade et al., 2014; van Beljouw et al., 2010; Demyttenaere et al., 2004; Jorm, 2000; Mechanic, 2002).

On the other hand, the need for medical treatment is not directly related to distress and disability, and studies have found attitudinal factors reflect the complex decisions and evaluations which affect

both perceived need and help-seeking behaviours (Mojtabai, Olfson, & Mechanic, 2002). For people with mental illness, they are generally stereotyped as dangerous, incompetent or unable to care for themselves (Ottati, Bodenhausen, & Newman, 2005) and studies have found that mental disorders are still highly stigmatized (Andrade et al., 2014; Jorm, 2000; Mechanic, 2002; Prins et al., 2008; Sareen et al., 2007; Schomerus & Angermeyer, 2008), which becomes especially distressing when an individual develops a mental health problem (Corrigan, Watson, & Barr, 2006). Mental health problems are the most disabling illness, and medical and psychosocial treatments are not being utilized by a majority of people that could benefit (Lawrence & Fulbrook, 2015). Treatments have been shown to be effective in relieving mental ill-health symptoms, but it is also important to note that there will be individuals who will not want to have any treatment, and there will also be individuals that will not recover from their symptoms (Insel & Scolnick, 2006).

Due to the high levels of morbidity associated with mental illness, removing barriers to increase service utilization is clearly a priority (Fleury et al., 2012). The development of strategies to enhance health care for individuals that are not seeking treatment for their mental illness, or do not perceive a need for mental health care but may be accessing health services for other conditions, has potential to increase access to health services for this otherwise difficult-to-reach population (Mojtabai et al., 2002). In this context, opportunistic health service presentations offer a chance to screen for underlying mental health conditions and may represent occasions where patients are amenable to intervention (Le Foll et al., 2014; Woodruff et al., 2013). However, while underlying mental health problems may be detected through screening, the individual's perceived need for treatment may pose a major barrier to treatment-seeking behaviours (Andrade et al., 2014). In this context, motivational interviewing (MI) may be a feasible pretreatment to other intervention or treatment, as it heightens motivation within the individual and stimulates them to seek and engage in further assistance (NICE, 2011). It has been used successfully with psychotic disorders by demonstrating effectiveness in the reduction of excessive drinking (Baker et al., 2012). It has also been shown to be successful for samples with comorbid substance use and mental illness when used in conjunction with other treatment therapies, for example, cognitive behaviour therapy (CBT) and relapse prevention, education and support (Horsfall et al., 2009).

Originally developed as a treatment for individuals with substance abuse disorders, MI offers a counselling-style approach (Miller & Rollnick, 2002), which is also malleable with other therapy styles (Walitzer, Dermen, & Connors, 1999). The “spirit” of MI carries four general principles: expression of empathy; development of discrepancy; rolling with resistance; and supporting self-efficacy. It is not a coercive method of behaviour change, but rather, helps create a degree of ambivalence by shifting the individual's focus to achievable positive lifestyle and behaviour choices, rather than focusing on changing negative behaviour (Miller & Rose, 2009). Rolling with resistance can turn or reframe to create a new impetus towards change (Miller & Rollnick, 2002), and by taking into account the trans-theoretical construct of change and the fact that change is often not linear. The stages of change are as follows: precontemplation, contemplation, preparation, action, maintenance and relapse (Prochaska, DiClemente, & Norcross, 1992). MI can assist the individual to shift from one stage of change to another, even after relapse.

Currently, little is known about the effectiveness of MI as a pretreatment for both (mental health) treatment-seeking and non-treatment-seeking individuals. In the stages of change model, individuals that are already seeking treatment would be considered to be motivated and in the “preparation” or the “action” stage of change, which is the desired outcome of successful MI interventions. A recent systematic review and meta-analysis of studies reporting on samples with psychotic, mood, anxiety, eating disorders and comorbid conditions explored the mechanisms of change with both patient and

therapist (Romano & Peters, 2015). Patient factors involved concepts such as readiness, motivation, confidence, engagement and the experience of discrepancy; and therapist factors such as MI consistency, MI spirit and empathy. The reviewers found that a majority of studies reported few MI mechanisms of change and there was also limited evidence for causal links to outcomes (Romano & Peters, 2015). Similarly, the first review, which focused on the mechanisms of change with MI, but in samples with substance use disorders (Apodaca & Longabaugh, 2009), also reported that that the evidence was limited.

Psychosocial therapy is based on interactions between the therapist and their client, and the variability of therapist adherence to the principles and processes of delivering interventions impacts on client behaviours (Imel et al., 2011). MI is based on the principles of resisting confrontation and remaining empathetic to strategically manoeuvre clients towards change (Imel et al., 2011). The causal chain for MI involves a technical process, which relates to the therapist's skills; the relational process relating to the relationship between therapist and client and the impact of the intervention; and the conflict resolution process, which aims to successfully explore and resolve client ambivalence (Magill et al., 2014). Measuring the process of MI can provide feedback regarding the quality and impact of the intervention and can also highlight areas where improvement in the quality of care is needed (Rubin, Pronovost, & Diette, 2001). However, as noted above, the evidence of this is limited, but the outcome measure of treatment attendance can also be used to measure the efficacy of MI.

Several literature reviews using MI have investigated samples of people with mental health problems, but mainly those with eating disorders. Macdonald et al. (2012) found that the results were promising but difficult to compare due to heterogeneity between studies. However, the results indicated that MI was most beneficial in regard to increasing “readiness to change” and may be useful in preparing individuals for change when they are not ready to instigate the change themselves. Unfortunately, the results did not analyse the outcome measure of treatment attendance. Dray and Wade (2012), who also reviewed the literature regarding samples with eating disorders, found that, similarly to Romano and Peters (2015), the casual factors for the effects of MI were weak, and the results were insufficient to properly assess the efficacy of MI. However, MI effects on the outcomes measure of treatment attendance were reported and they found one study in which participants in the “treatment as usual group” were 1.33 times more likely (95% CI = 1.03–1.72) to withdraw from the study, compared to those in the MI group (Wade et al., 2009).

Although their analysis concerned the mechanisms of change of MI, Romano and Peters (2015) reviewed samples with a broader range of mental health conditions: mood, anxiety, psychotic and eating disorders, and also comorbid conditions; 11 of the 16 studies they reviewed reported on the outcome measure of post-intervention treatment attendance. Their pooled data demonstrated a significantly enhanced attendance for MI samples ($d = 0.38$, $p = .012$) but with substantial heterogeneity ($I2 = 65.85$, $p < .001$). Subgroup analyses (eating disorders, mood, anxiety, psychotic) revealed MI achieved a nonsignificant effect for samples with eating disorders ($d = 0.08$), and a medium effect for samples with anxiety, mood and psychotic disorders ($d = 0.54$, $p = .003$). The authors did not take into account the analysis of treatment-seeking and non-treatment-seeking samples, as those that are seeking treatment are already motivated or are prepared to change.

In summary, the current evidence (Romano & Peters, 2015) suggests that MI is effective to enhance treatment attendance for people with a mental illness. However, only one meta-analysis appears to have been undertaken (Romano & Peters, 2015), which demonstrated substantial heterogeneity, and did not specifically investigate the effects of MI on non-treatment-seeking samples. Therefore, the primary aim of this systematic review and meta-analysis was to investigate the effectiveness of

MI when compared to other interventions or treatment as usual, on both treatment-seeking and non-treatment-seeking groups. The efficacy of MI as a motivator was measured in terms of the outcome measure of treatment attendance.

METHODS

Eligibility criteria

The study inclusion criteria for the systematic review were as follows:

Population: All participants expressed symptoms of mental ill-health or had been diagnosed with a mental illness according to validated diagnostic tools

Intervention: Given as a pretreatment and was described as “motivational interviewing,” “motivational interview,” “motivation intervention,” or a “brief intervention,” or based on the principles of motivational interviewing

Control/comparator: The comparison or control groups were as follows: (i) any alternative intervention which did not contain elements of motivational interviewing; or, (ii) standard treatment or no treatment

Outcomes: Post-MI treatment attendance was reported.

Search and study selection

Literature was sourced from the electronic databases of Medline, EMBASE and CINAHL including a general Internet search using Google scholar, and references of relevant articles were also searched. A deliberately broad search strategy was employed, using the following search terms: intervention (“motivational interviewing” OR “motivation interview” OR “motivational intervention” OR “motivation enhancement” OR “brief intervention”), broad population characteristics (“mental health” OR “depression” OR “anxiety” OR “stress”), limited to “English,” “adult” and “randomized controlled trials”. No date limits were applied to the search, and additional material was gleaned from reference lists and bibliographies. The final search was conducted in late 2016. There is no single validated critical appraisal tool for assessing RCTs for literature reviews, and traditionally, “risk of bias” is the main focus of assessment. High internal validity is important to demonstrate the effectiveness of an intervention, but consideration must also be given to heterogeneity of included studies. The quality of included studies for this review was assessed using the Critical Appraisal Skills Program (CASP); a validated tool for evaluation of methodological rigour of randomized controlled trials (RCTs) (CASP, 2013). It was selected over other validated and popular appraisal tools, due to its comprehensive evaluation criteria in the following areas: Population, Intervention, Comparator, Outcomes (PICO) statement; randomization techniques; blinding of sample, researchers, assessors; intention to treat; treatment fidelity; baseline characteristics of sample; treatment bias; reporting of effect sizes; and accounting of participants at conclusion of study.

Data collection

Using a modified version of the CASP as a template, all literature was systematically examined and reviewed in terms of: sample characteristics (severity of symptoms, diagnosis, treatment seeking, gender, age); diagnostic screening tools used; sample size; MI treatment fidelity (qualification of intervention therapists, use of a manual, training, supervision of intervention, formal assessment of intervention); MI treatment intensity; comparison treatments; outcome measures; results; and

treatment attendance. Biases, limitations and their effect on outcomes stated by individual studies were also noted.

Synthesis of results

The primary outcome measure was attendance, expressed as a dichotomous variable, with the end-point measured as the number or proportion of participants that attended for treatment following MI intervention; regardless of whether they had completed post-MI treatment or not. Only studies that reported results of the number of completers of post-MI intervention were included in the pooled data for the meta-analysis. Data were analysed using RevMan 5.3™ software (The Cochrane Collaboration, 2014). Initially, data were analysed as a whole, followed by subgroup analysis to compare treatment-seeking and non-treatment-seeking participants. Although all studies included participants with mental health problems, the samples were not homogenous and differed in terms of their sample size, severity of participants' mental illness, types of mental illness and treatment settings. For these reasons, a random-effects model was used, as it takes into consideration the different effect sizes of each study and estimates the mean (Bornenstein et al., 2009; Schroll, Moustgaard, & Gotzsche, 2011), whereas a fixed-effects model assumes that the effect size is the same for all studies, and smaller studies with smaller effect sizes have little influence on the overall effect (Bornenstein et al., 2009). The data are dichotomous (attended post-MI therapies/did not attend post-MI therapies), and a Mantal-Haenszel method was used as it is best when sample sizes are small and has demonstrated better statistical properties when data are sparse (Higgins & Green, 2011).

The forest plot was visually inspected to observe the confidence interval (CI) overlap (Ried, 2006). Where studies did not overlap the line of no effect, they were considered to be too different to combine to a single estimate and were excluded from the pooled data and the analysis was re-run (Ried, 2006). Heterogeneity is reported using the I2 index, and the magnitude of heterogeneity can be classified as low (I2 = 25%), medium (I2 = 50%) and high (I2 = 75%) (Higgins & Thompson, 2002). As a measure of effect, odds ratios (OR) were calculated for individual studies, as well as overall. A funnel plot was also generated to investigate potential reporting bias of the studies.

RESULTS

Study selection

Including duplicates, the initial search yielded a total of 5,009 articles (refer to Figure 1). After the removal of duplicates, protocols, paediatric samples and literature reviews, there were 1,129 papers remaining. Following an initial review of the title, abstract and reference list; 54 potentially relevant studies were identified for further examination. Full texts of these studies were then reviewed independently by two members of the review team against the inclusion criteria. Disagreements were arbitrated by a third team member. Fourteen RCTs were identified for inclusion in the full review, and are summarized in Table 1. Most studies originated from the United States, with two exceptions: Baker et al. (2002) (Australia) and Westra and Dozois (2006) (Canada).

Figure 1: PRISMA search strategy

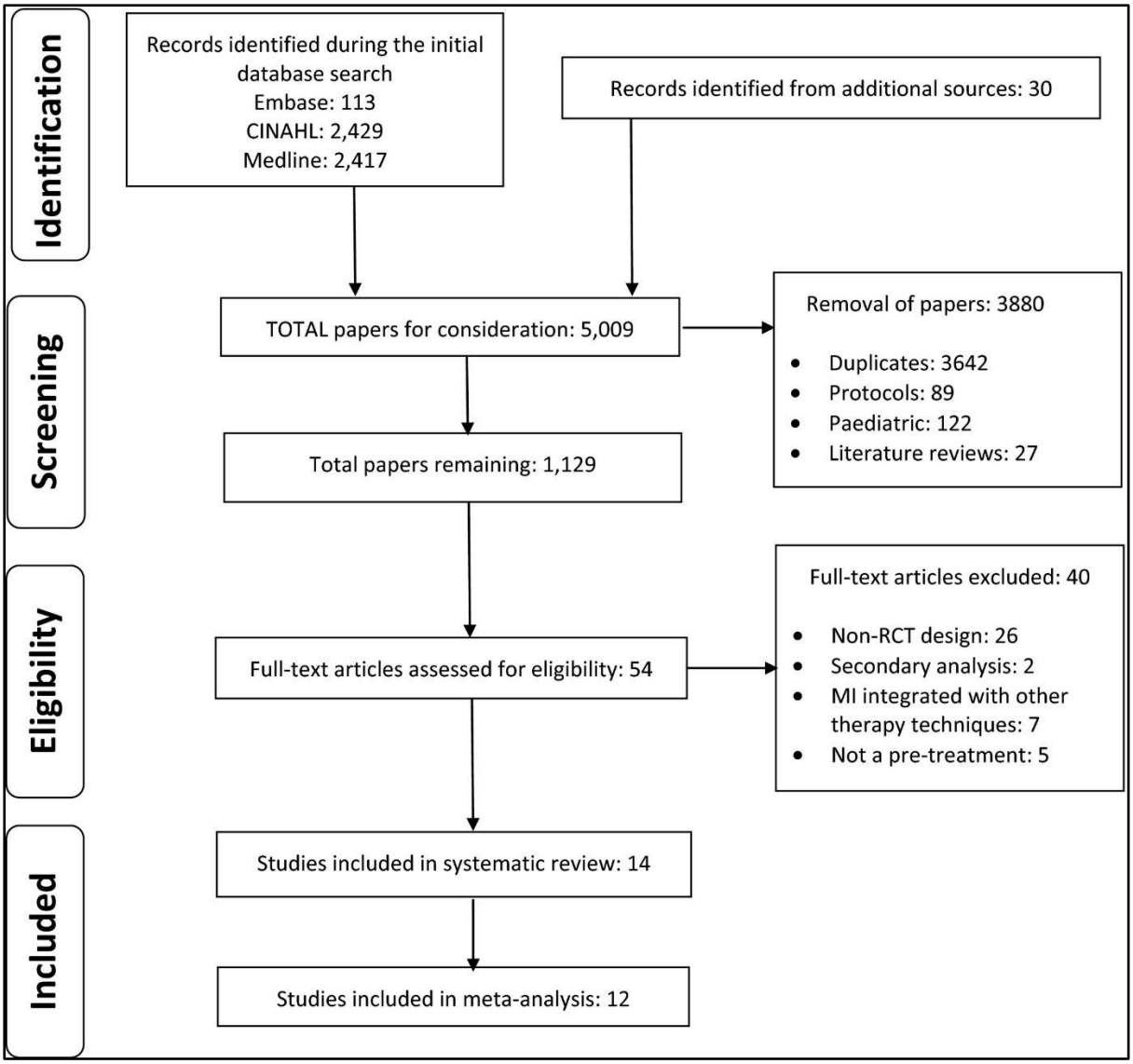


Table 1. Included studies

Authors	Sample and setting	Screening tools	Sample size (*n*)		Gender		Mean age (SD)		Comments
			Intervention	Control/comparator	Intervention	Control/comparator	Intervention	Control/comparator	
Baker et al. (2002)	Severe symptoms/dual diagnosis/ treatment seeking/inpatient	SCID DSM	79	81	NR	NR	NR	NR	Overall sample Gender: Male: 75% (*n* = 120) Mean age: 30.87 (range 16–70)
Buckner and Schmidt (2009)	Moderate and severe symptoms/social anxiety disorder/nontreatment seeking/outpatient	SIAS	12	15	M: 41.7% (*n* = 5)	M: 33.3% (*n* = 5)	18.9 (SD: 0.9)	18.7 (SD: 0.7)	
Fiszdon et al. (2016)	Severe symptoms/schizophrenia/nontreatment seeking/outpatient	SCID, DSM	33	31	M: 48% (*n* = 16)	M: 65% (*n* = 20)	46.52 (SD: 9.96)	49.26 (SD: 11.23)	

Korte and Schmidt (2015)	Moderate symptoms/anxiety sensitivity/nontreatment seeking/outpatient	ASI	12	11	M: 0% (*n* = 0)	M: 18% (*n* = 2)	NR	NR	Overall sample Mean age: 19.17 (SD: 3.53)
Maltby and Tolin (2005)	Severe symptoms/obsessive compulsive disorder/nontreatment seeking/outpatient	SCID, DSM	7	5	M: 42.9% (*n* = 3)	M: 60% (*n* = 3)	37.6 (SD: 15.3)	40.0 (SD: 10.2)	
Martino et al. (2000)	Severe symptoms/dual diagnosis/treatment seeking/outpatient	DSM diagnosis by clinical consensus	13	10	NR	NR	NR	NR	Overall sample Mean age: 35.35 (SD: 6.4) Gender: Male: 65% (*n* = 15)
Martino et al. (2006)	Severe symptoms/dual diagnosis/treatment seeking/inpatient, outpatient	SCID, DSM	24	20	M: 75% (*n* = 18)	M: 70% (*n* = 14)	29.71 (SD: 9.46)	34.10 (SD: 11.48)	

Seal et al. (2012)	Severe symptoms/post-traumatic stress disorder, depression, anxiety, substance use disorder/nontreatment seeking/outpatient	PTSDC-MV, PHQ, PRIME MD, AUDIT, Addiction Severity Index	34	39	M: 52.9% (*n* = 18)	M: 74.4% (*n* = 29)	21–29: 55.9% 30–39: 23.5% 40–70: 20.6%	21–29: 41.0% 30–39: 38.5% 40–70: 20.5%	
Simpson et al. (2010)	Moderate and severe symptoms/obsessive compulsive disorder/treatment seeking/inpatient	Y-BOCS	15	15	M: 53% (*n* = 8)	M: 53% (*n* = 8)	40.7 (SD: 11.1)	39.1 (SD: 15.7)	
Swanson et al. (1999)	Severe symptoms/dual diagnosis/treatment seeking/inpatient	SCID, DSM	64	57	M: 62% (*n* = 39)	M: 63% (*n* = 40)	32.6	34.9	
Syzdek et al. (2014)	Moderate symptoms/internalizing symptoms/nontreatment seeking/outpatient	DUKE	12	11	M: 100% (*n* = 12)	M: 100% (*n* = 11)	NR	NR	Overall sample Mean age: 37.65 (range: 19–57)
Syzdek et al. (2016)	Moderate symptoms/psychological distress/nontreatment seeking/outpatient	DUKE	18	13	M: 100% (*n* = 18)	M: 100% (*n* = 13)	19.94	19.38	

Westra and Dozois (2006)	Severe symptoms/anxiety/treatment seeking/outpatient	SCID, DSM	25	30	NR	NR	NR	NR	Overall sample Mean age: 38 (SD: 11) Gender: Male: 30% (*n* = 17)
Zanjani et al. (2008)	Severe symptoms/dual diagnosis, substance use disorder/nontreatment seeking/outpatient	PHQ	57	56	M: 98% (*n* = 56)	M: 93% (*n* = 52)	54 (SD: 12)	51 (SD: 11)	

ASI, Anxiety Sensitivity Index; AUDIT, Alcohol Use Disorders Identification Test; DUKE, DUKE Health profile (anxiety and depression subscale); NR, Not Reported; PHQ, Patient Health Questionnaire; PRIME MD, Primary Care Evaluation of Mental Disorders; PTSDC-MV, Post-traumatic Stress Disorder Checklist – Military Version; SCID DSM, Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders; SIAS, Social Interaction Anxiety Scale; Y-BOCS, Yale-Brown Obsessive Compulsive Disorder Scale.

Table 2. Quality appraisal

Study	PICO	Randomization	Blinding			Intention to treat	Treatment fidelity	Baseline characteristics	Treatment bias	Reported effect size	Participants accounted for	Quality score
			Participants	Researchers	Assessors							
Baker et al. (2002)	✓	✓		✓				✓	✓	Small	✓	7
Buckner and Schmidt (2009)	✓	✓		✓			✓	✓	✓	Small	✓	8
Fiszdon et al. (2016)	✓	✓	✓			✓	✓	✓	✓	Large	✓	9
Korte and Schmidt (2015)	✓	✓					✓		✓		✓	5
Maltby and Tolin (2005)	✓	✓		✓			✓	✓	✓		✓	7
Martino et al. (2000)	✓	✓						✓	✓		✓	5
Martino et al. (2006)	✓	✓				✓	✓	✓	✓	Small	✓	8

Seal et al. (2012)	✓	✓		✓		✓	✓	✓	✓	Large	✓	9
Simpson et al. (2010)	✓	✓		✓			✓	✓	✓		✓	7
Swanson et al. (1999)	✓	✓					✓	✓	✓		✓	6
Syzdek et al. (2014)	✓	✓					✓		✓	None	✓	6
Syzdek et al. (2016)	✓	✓							✓	Small to medium	✓	5
Westra and Dozois (2006)	✓	✓			✓		✓	✓	✓	Small	✓	8
Zanjani et al. (2008)	✓	✓					✓	✓	✓		✓	6

Quality appraisal

Results of the quality appraisal are summarized in Table 2. Methodological quality of the included studies was restricted, and biases of the studies were due mainly to blinding issues, where blinding of the sample, researchers and clinicians was not reported consistently. Two studies self-reported their sample may be biased due to recruitment methods (Buckner & Schmidt, 2009; Maltby & Tolin, 2005). In the study by Maltby and Tolin (2005), an outpatient clinic sample was recruited that had initially refused to participate in exposure and response therapy. The sample comprised participants with high levels of motivation, where 57% claimed their stage of change category being either in the action or maintenance phase. In the study by Buckner and Schmidt (2009), the researchers masked the study intention by describing it as an "interview study of anxiety," which may have attracted already motivated participants to discuss and change behaviour.

Eight studies did not report their randomization methods (Baker et al., 2002; Fiszdon et al., 2016; Korte & Schmidt, 2015; Maltby & Tolin, 2005; Martino et al., 2000; Syzdek, Green, & Lindgren, 2016; Syzdek et al., 2014; Westra & Dozois, 2006). Three studies used a stratification method of randomization to ensure equal distribution between groups (Seal et al., 2012; Simpson et al., 2010; Zanjani et al., 2008); two used a random numbers table (Buckner & Schmidt, 2009; Swanson, Pantalon, & Cohen, 1999), and one used an urn procedure (Martino et al., 2006).

All studies reported attrition rates and accounted for all patients at the study conclusion. However, a majority of studies did not report on their intention to treat. This may have been due to treatment attendance being the goal (Baker et al., 2002; Fiszdon et al., 2016; Korte & Schmidt, 2015; Maltby & Tolin, 2005; Martino et al., 2000; Simpson et al., 2010; Swanson et al., 1999; Syzdek et al., 2016; Zanjani et al., 2008). Only one study (Seal et al., 2012) conducted follow-up by checking medical records for evidence of attendance (at 4, 8 and 16 weeks) and five studies collected other follow-up data at varying time-points (4 weeks to 6 months). Buckner and Schmidt (2009) conducted follow-up to one month and collected data regarding willingness to schedule a CBT appointment, readiness for change, and importance and confidence to change social anxiety-related behaviours. Martino et al. (2006) conducted follow-up to 12 weeks and collected data regarding substance use, treatment adherence, psychiatric symptoms, readiness to change and satisfaction with interviews. Syzdek et al. (2014) conducted follow-up to 3 months, and collected data regarding mental health functioning, stigmas about internalizing disorders, and seeking help from formal and informal sources. Syzdek et al. (2016) conducted follow-up to 2 months and collected data regarding help-seeking behaviours and mental health functioning. Westra and Dozois (2006) conducted follow-up to 6 months and collected data regarding changes to mental illness diagnosis by readministering the Structured Clinical Interview for Axis 1 disorders.

Study characteristics

A total of 803 participants were included in the 14 trials with a mean sample size of 57.4 (range 12–160) (refer to Table 1). Four studies reported small sample size as a limitation, lacking power to detect effects on study outcomes (Buckner & Schmidt, 2009; Martino et al., 2006; Simpson et al., 2010). All studies reported on gender with half of the studies reporting only in percentages (Baker et al., 2002; Buckner & Schmidt, 2009; Fiszdon et al., 2016; Korte & Schmidt, 2015; Maltby & Tolin, 2005; Martino et al., 2000; Swanson et al., 1999; Westra & Dozois, 2006). The approximate gender distribution for the entire sample was 546 (68%) males and 257 (32%) females. A majority of the studies reported unequal gender recruitment, but the settings for recruitment and sample type reflected the disproportionate sampling. Three studies that recruited participants with anxiety disorders or sensitivity (Buckner & Schmidt, 2009; Korte & Schmidt, 2015; Westra & Dozois, 2006)

reported a higher female participation (63%, 91% and 70%, respectively), and four studies recruiting for dual diagnosis reported a larger male participation (62–75%) (Baker et al., 2002; Martino et al., 2000, 2006; Swanson et al., 1999). This is consistent with previous studies across all age groups that indicate that despite women having a higher prevalence of mental illness, men have a higher prevalence of substance use and behavioural disorders (AIHW, 2015). Both Seal et al. (2012) and Zanjani et al. (2008) reported male participation of 64% and 96%, respectively; however, the recruitment settings were veteran medical centres where a large proportion of men is usual (Hoggatt et al., 2015). Syzdek et al. (2014) only targeted and recruited non-treatment-seeking men due to them being less likely to seek help for mental health issues (Clement et al., 2015).

With the exception of two studies (Baker et al., 2002; Swanson et al., 1999), most studies were conducted in outpatient settings. Martino et al. (2006) recruited both inpatients and outpatients. Eight studies recruited non-treatment-seeking samples (Buckner & Schmidt, 2009; Fiszdon et al., 2016; Maltby & Tolin, 2005; Seal et al., 2012; Zanjani et al., 2008). The remainder (n = 6) recruited treatment-seeking samples (Baker et al., 2002; Korte & Schmidt, 2015; Martino et al., 2000, 2006; Simpson et al., 2010; Swanson et al., 1999; Syzdek et al., 2014, 2016; Westra & Dozois, 2006). Five studies had criteria that included individuals with subthreshold symptoms of mental illness. Buckner and Schmidt (2009) used the Social Interaction Anxiety Scale with a clinical cut-off score of ≥43, indicating probable social anxiety. Korte and Schmidt (2015) used the Anxiety Sensitivity Index with a cut-off score of 25 to ensure the sample participants were experiencing sufficient symptoms, while excluding participants with a current diagnosis of anxiety and those with a history of a severe mental disorder. Simpson et al. (2010) used the Yale-Brown Obsessive Compulsive Disorder Scale with a cut-off score of 16, to indicate moderate symptoms. The studies by Syzdek et al. (2014, 2016) used the anxiety and depression subscale from the DUKE Health Profile with a cut-off score of ≥30, indicating significant symptoms.

Intervention intensity and fidelity

The number and duration of MI interventions varied, ranging from 1 to 2 phone calls for 15 min each (total 30 min) (Zanjani et al., 2008) to three face-to-face sessions totalling 6.5 hr (Buckner & Schmidt, 2009) (see Table 3). All studies, with the exception of Seal et al. (2012), described a script or protocol for the MI intervention. Seal et al. (2012) based their intervention on findings from their pilot study, and also from results of a meta-analysis (Hettema, Steele, & Miller, 2005) that indicated MI intervention effect size was not predicted by MI duration, purity, counsellor training or post-training support. Hettema et al. (2005) found that a manual-based protocol was the only associated factor that predicted outcome (8.5% of the variance), and studies that did not use a manual reported higher effect scores (d = 0.65) than those that had used one (d = 0.37). All studies reported on MI training and supervision for MI therapists, except four (Fiszdon et al. (2016) Martino et al. (2000), Maltby and Tolin (2005), Syzdek et al. (2014). However, Fiszdon et al. (2016) formally evaluated a random sample of 20% of recorded interviews (see Table 4).

Table 3. Characteristics of intervention and control groups				
Study	**Design**	**MI intensity**	**Control**	**Outcome**
Baker et al. (2002)	MI/no treatment + booklet	1 × 30–45 min	Usual care, no or minimal treatment and self-help booklet	MI = no treatment + booklet
Buckner and Schmidt (2009)	MI/comparator	Three sessions totalling 6.5 hr	3 × sessions psycho-education, total, 3 hr	MI > comparator
Fiszdon et al. (2016)	MI/comparator	2 × 30–45 min	2 × 30–45 min	MI > comparator
Korte and Schmidt (2015)	MI/comparator	1 × 45–60 min	1 × 35–50 min	MI > comparator
Maltby and Tolin (2005)	MI/no treatment	4 × 4 weeks, minutes not reported	Wait list; no or minimal treatment	MI > no treatment
Martino et al. (2000)	MI/standard care	1 × 45–60 min	1 × 45–60 min	MI > standard care
Martino et al. (2006)	MI/standard care	2 × 1 hr × 1 week	Standard psychiatric Interview (SI), 2 sessions × 1 hr × 1 week	MI > standard care
Seal et al. (2012)	MI/comparator	4 × 20–30 min telephone calls	Attention control, 4 short telephone calls × 8 weeks	MI > comparator
Simpson et al. (2010)	MI/standard care	3 × 90 min	Standard treatment, 3 × 90 min	MI < standard care
Swanson et al. (1999)	MI/standard care	1 × 15 min/1 × 60 min	Standard treatment, individualized treatment plan	MI > standard care
Syzdek et al. (2014)	MI/no treatment	1 × 2 hr	No pretreatment	MI > no treatment

Table 3. Characteristics of intervention and control groups				
Study	**Design**	**MI intensity**	**Control**	**Outcome**
Syzdek et al. (2016)	MI/no treatment	1 × 2 hr	No pretreatment	MI > no treatment
Westra and Dozois (2006)	MI/no treatment	3 × 1 hr	No pretreatment, no or minimal treatment	MI > no treatment
Zanjani et al. (2008)	MI/no treatment	1–2 calls × 15 min	Usual care, no or minimal treatment	MI > no treatment

Table 4. MI treatment fidelity measures					
Study	**Therapists**	**Specific manual or interview protocol**	**Training**	**Supervision**	**Tapes sessions (audio/video) and assessed**
Baker et al. (2002)	4 × psychologists. Unknown if exclusive to MI or control.	Yes, therapist manual	Yes. No details. First author provided initial training	Weekly by first author	Unknown
Buckner and Schmidt (2009)	3 × doctoral students. Unknown if exclusive to MI or control.	Yes, motivation enhancement treatment for cognitive behavioural therapy protocol	Yes, 6 hr of didactic instruction, shadowing, training cases	Weekly	25% randomly selected, MITI, independent rater
Fiszdon et al. (2016)	Nonspecific therapist. Unknown if exclusive to MI or control.	Yes, DDMI therapist manual	Unknown	Unknown	20% randomly selected, specially designed evaluation form, blind rater
Korte and	1 × doctoral student.	Yes, motivation enhancement	Unknown	Yes, by second author	Unknown

Table 4. MI treatment fidelity measures					
Study	**Therapists**	**Specific manual or interview protocol**	**Training**	**Supervision**	**Tapes sessions (audio/video) and assessed**
Schmidt (2015)	Administered both MI and control	treatment protocol			
Maltby and Tolin (2005)	Nonspecific therapist. Unknown if exclusive to MI or control	Unknown	Unknown	Unknown	Unknown
Martino et al. (2000)	1 × doctoral degree in psychology. Administered both MI and control	Unknown	Unknown	Unknown	Unknown
Martino et al. (2006)	1 × doctoral degree in psychology, 2 masters in social work, 1 bachelor of psychology. Administered both MI and control	Yes, DDMI therapist manual	Yes, First author trained therapists, intensive workshop training, postworkshop practices	Yes, dependant on treatment sessions	6 randomly selected, specially designed evaluation form, independent rater
Seal et al. (2012)	Minimum of master's degree in psychology or related field. Unknown if exclusive to MI or control	Unscripted	Yes, 16 hr MI training	Monthly. MI trainer provided feedback	Almost all calls were coded and rated, MITI, independent blinded rater
Simpson et al. (2010)	2 × doctoral level therapists. Administered both MI and control	Yes, exposure and response and motivational interviewing + MI manual	Yes, relevant readings, 3 days training, training cases	Weekly phone supervision	10% assessed, MITI, independent blinded rater
Swanson et al. (1999)	Four upper level undergraduate psychology students. Control was standard treatment. All therapists conducted MI	Unknown	Yes, relevant readings, 6 hr of didactic instruction, role play with feedback	Daily	Unknown

Table 4. MI treatment fidelity measures

Study	Therapists	Specific manual or interview protocol	Training	Supervision	Tapes sessions (audio/video) and assessed
Syzdek et al. (2014)	Unknown	Yes, GBMI protocol	Unknown	Unknown	Unknown
Syzdek et al. (2016)	2 × graduate students. Control group was no treatment. Therapist exclusive to MI	Yes, GBMI protocol	Yes, fourth author trained therapists	Yes, no details	Assessed during supervision, unknown number assessed, not formally measured
Westra and Dozois (2006)	1 × PhD level clinical psychologist. Control group was no treatment. Therapist exclusive to MI	Yes, therapist manual	Yes, over 6 months (5 hr per week). First 15 cases videotaped	Yes, closely by first author	Random sample, unknown number assessed, not formally measured
Zanjani et al. (2008)	Registered nurses. Control group had automated calls. Therapists exclusive to MI	Yes, TBR-CM manual	Therapists have several years of experience – nonspecific	Weekly by psychiatrist	Not formally measured

DDMI, dual diagnosis motivation interview; GBMI, Gender-based motivational interview; MITI, Motivational Interview Treatment Integrity; TBR-CM, telephone-based referral care management.

Several tools, such the Motivational Interviewing Treatment Integrity (MITI) coding (Moyers et al., 2010), were used to report MI fidelity (see Table 5), but studies varied in the level of detail provided. Buckner and Schmidt (2009) reported that the therapists' mean global rating scale ranged from 6.11 to 7.00 (mean 6.45, SD 0.72), and were competent for MI (a rating above 6 was recommended). Seal et al. (2012) stated that 88% of statements made during the interviews were congruent with MI principles. Only Simpson et al. (2010) reported the MITI ratings for global scores, and the subscale scores for Evocation, Collaboration, Autonomy and Direction. They specifically reported that the Direction subscale was not MI congruent and was similar to the control group scores. Fiszdon et al. (2016) used a specially designed assessment form for their study and stated that the MI interviews were higher than the control group in regard to MI strategy adherence (6.05 vs. 2.58, $p = .001$) and MI competence (4.48 vs. 3.66, $p = .006$). There were no significant differences between the MI and

control groups regarding general interview adherence or competence (p > .05). Martino et al. (2006) used a specially designed assessment tool and reported that the control group and the MI group (dual diagnosis) were distinct from each other as the MI intervention had high rates of adherence (p < .001) and competence (p < .001). The control group also reported a high rate of adherence (p < .001) and competence (p < .001) to the MI intervention. Six studies did not report on the interview fidelity assessment of audio/video of the MI interviews (Baker et al., 2002; Korte & Schmidt, 2015; Maltby & Tolin, 2005; Martino et al., 2000; Swanson et al., 1999; Syzdek et al., 2014, 2016).

Table 5. Outcomes

Authors	Outcome measures	Results
Baker et al. (2002)	SSMS engagement	3 months: No difference in attendance 13/79 (16.5%) vs. 14/81 (17.3%). MI averaged 4.46 (3.23) session while control averaged 5.79 (2.81) sessions
	Readiness to change and substance use	3 months: No percentage difference for treatment attendance according to stages of change (late contemplation/action vs. precontemplation/early contemplation): threshold drinkers (19.6% vs. 9.8%), cannabis users (16.4% vs. 13.7%), or amphetamine users (36.0% vs. 9.1%)
Buckner and Schmidt (2009)	Attendance at first cognitive behavioural therapy	Greater likelihood of cognitive behavioural therapy attendance [58.3% (7/12) vs. 13.3% (2/15), p = .048].
	Openness to therapist	Approached significance (p = .059). Significant time x condition interaction (p = .02, w^2 = 0.02)
	Willingness to schedule appointment	Significant at appointment 3, p = .006; willingness was related to attending CBT, p = .01
	Willingness to change	Improved confidence (p = .03); time x condition approached significance (p = .06)
Fiszdon et al. (2016)	Intrinsic motivation	Intrinsic motivation scores increased over time (p < .001); after MI (d = 1.49); after cognitive rehabilitation training (d = 1.19)
	Attendance	Better attendance for cognitive rehabilitation (mean sessions: 0.96, control; 5.06, intervention) (p < .001, d = 1.10)
Korte and Schmidt (2015)	Motivation Readiness to change	MI associated with precontemplation subscale
		MI associated with Contemplation subscale
	Importance	Condition favouring MI
	Confidence	Condition favouring MI
	Attendance	MI group more likely to complete ASAT intervention

Table 5. Outcomes

Authors	Outcome measures	Results
Maltby and Tolin (2005)	Exposure and response prevention participation	Greater likelihood of agreeing to participate [86% (6/7) vs. (20% (1/5), $p < .05$]
	Treatment efficacy	Post- to pretreatment: RI group had significant greater decreases in fear of exposure and response prevention than WL, $p < .05$. Postexposure and response prevention: Y-BOCS scores dropped 59%, from severe to mild (mean 28.33, SD 1.53; mean 11.67, SD 7.77). CGI scores showed improvements
Martino et al. (2000)	ERP participation	Greater likelihood of agreeing to participate 6/7 (86%) vs. 1/5 (20%)
	Treatment efficacy	Post- to pretreatment: RI group had significant greater decreases in fear of ERP than WL Post-ERP: Y-BOCS scores dropped 59%, from severe to mild (M = 28.33, SD = 1.53, to, M = 11.67, SD = 7.77) CGI scores showed improvements
Martino et al. (2006)	Treatment adherence	No differences between groups, but trend in favour for DDMI (79% vs. 55%) for programme admission. No differences for days of programme attendance. No participant remained in programme at 12 weeks
	Days of substance use in 4 weeks	Baseline to 12 weeks, all participants reduced frequency over time: primary drugs (44%), $p < .01$; other drug use (40%), $p = .04$; alcohol use (37%), $p = .02$. No differences between interview groups or group x time. Regression used to determine differences by primary drug use. DDMI: Primary cocaine users, $p = .01$. Reduction in frequency of cocaine use by 80%, and secondary drug use and alcohol over time
	Substance use problem severity	No differences between groups. Participants achieved 50.11 (SD 28.89) days primary drug abstinence. Abstinence of secondary drugs for 67.84 (SD 24.46) days, and alcohol 65.35 (SD 25.86) days. Changes over time for Addiction Severity Index substance use scores: problem reduction for primary drug use, $p < .01$; secondary drug use, $p = .01$; alcohol use, $p = .04$; Problems with secondary drug use increased over time for DDMI ($p < .01$)
	Days of medication adherence	Increased adherence in both groups by 18.8% ($p < .01$), Mean: 18.33–21.77 days, DDMI: $d = 0.17$, SI: $d = 0.51$. No differences between groups over time
	Psychiatric problem severity	All participants reported reduced psychological problems, all scales ($p = .01$). Group x time for the PANSS negative subscale ($p = .03$). DDMI patients had slower decline in negative psychotic symptoms over time

Table 5. Outcomes		
Authors	**Outcome measures**	**Results**
	Readiness to change substance use and psychiatric condition	No differences, for groups, between groups over time. Marijuana users less motivated than cocaine users for addressing primary drug use: mean RTC score, 63.0 vs. 78.4 (p = .01)
	Interview experiences	No differences between groups.
Seal et al. (2012)	MI to improve mental health treatment initiation	More MI group engaged in mental health treatment (62% vs. 26%; relative risk = 2.41, 95% CI = 1.33–4.37, p = .004, d = 0.74)
	Mental health treatment retention	Greater number of mental health visits (1.68, SD 2.73 vs. .38, SD .81; incidence rate ratio = 4.36, 95% CI = 1.96–9.68, p < .001)
	Mental health symptoms	Both groups experienced slight decreases in depression scores and post-traumatic stress disorder scores but not significant
	Barriers to care	Decreased stigma regarding mental health treatment at 8 weeks (p = .03), and approached significance at 16 weeks (p = .07)
	Readiness	Greater readiness to change at 16 weeks: approached significance (p = .06)
	Engagement	Greater intention to engage in mental health treatment at 8 weeks (p = .02) and 16 weeks (p = .05)
Simpson et al. (2010)	Patient engagement	EX/RP = 14/15 completions vs. EX/RP + MI = 11/15 completions
	Patient adherence to between-sessions EX/RP procedures	No difference between groups in total PEAS scores, p = .61
	Therapist adherence to treatments	High adherence to EX/RP condition. High MITI global ratings for MI intro sessions except for Direction, which was also low in the MI group, and generally not congruent with MI principles
	Obsessive compulsive disorder symptoms;	No differences between groups (p = .61)
	Y-BOCS	No differences between groups (p = .51).
	Depression	No difference between groups (p = .86).
	Quality of life	No difference between groups (p = .38).
Swanson et al. (1999)	First outpatient attendance	More MI patients went to first appointment (p < .01): dual diagnosis, p < .01; psychotic: 47% vs. 21%, p < .05; affective: 50% vs. 20%, p < .05

Table 5. Outcomes

Authors	Outcome measures	Results
	Attendance of inpatient activities	Nondual diagnosis trend towards attending more cognitive behavioural therapy (46% vs. 17%, p = .061)
	Attrition	None
Syzdek et al. (2014)	Depressive symptoms	T2: small effect, d = 0.43, p > .05; T3: moderate effect, d = 0.50 (p > .05). Symptoms decreased from mild to minimal
	Anxiety symptoms	T2: small effect, d = 0.37, p > .05; T3: moderate effect, d = 0.59 (p > .05). Symptoms decreased from mild to minimal
	Health-seeking behaviours	Formal help seeking; Attitude: no effect at T2 and T3; Intentions: T2: small effect, d = 0.39 (p > .05); T3: small effect, d = 0.28 (p > .05)
		Informal help seeking: Intentions; T2: large effect, d = −0.85 (p = .07); T3: moderate effect, d = −0.05 (p > .05)
Westra and Dozois (2006)	MI response	Mental health. Anxiety and depression: not significant
	Engagement with cognitive behavioural therapy treatment completion	Cognitive behavioural therapy response. Standard scores principle outcomes measures, both groups showing improvement (p < .05). Significant 2 way interaction (p < .05, d = 0.38). Greater reductions in principle outcomes measures (p < .05). Reduction in depression symptoms (BDI-II), approaching significance (p < .06, d = 0.64). 84% vs. 63% competed cognitive behavioural therapy, approaching significance (p = .08). Completers tended to be more highly educated than drop outs (p < .05)
	Motivation for change	Baseline to post-MI: expectancy for change: ACES × time (p < .05, d = 0.06); diagnostic subgroups (p < .05)
	Homework	Client rated homework compliance (p < .05, d = 0.96).
		Therapist rated homework compliance, not significant
	Attrition	5.5% (3/55) loss at 6 months
Zanjani et al. (2008)	Treatment attendance	More likely to attend psychiatric appointment (70% vs. 32%; p < .001). Intervention participants that had BMI were more likely to attend scheduled appointment than intervention group who did not complete BMI (79% vs. 22%; p < .001). Overall appointments: intervention group attended more appointments over 6 months (p = .008). Intervention effect remained significant when controlled for age and diagnostic group

Comparison treatments

In five studies, the comparison interventions were either no treatment or minimal treatment (Maltby & Tolin, 2005; Syzdek et al., 2014, 2016; Westra & Dozois, 2006; Zanjani et al., 2008), while Seal et al. (2012) conducted four short phone calls over 8 weeks to discuss logistics regarding appointments. Five studies reported that the comparison group was standard treatment or usual care, that is, face-to-face interviews that were not MI-based (Baker et al., 2002; Martino et al., 2000, 2006; Simpson et al., 2010; Swanson et al., 1999), while Buckner and Schmidt (2009), Korte and Schmidt (2015) and Fiszdon et al. (2016) used an alternative intervention of psychosocial education as a comparison intervention (see Table 3). Martino et al. (2006) and Swanson et al. (1999) both indicated, however, that the absence of a nontreatment group was a limitation, while Westra and Dozois (2006) indicated that their study was limited by having the same therapist for both the MI group and comparison group.

Several studies explicitly stated having the same therapist for both intervention and control groups but did not acknowledge this as a limitation (Korte & Schmidt, 2015; Martino et al., 2000, 2006; Simpson et al., 2010). Half the studies did not mention whether or not study therapists were exclusive to the MI intervention or conducted both interventions (Baker et al., 2002; Buckner & Schmidt, 2009; Fiszdon et al., 2016; Maltby & Tolin, 2005; Seal et al., 2012; Swanson et al., 1999; Syzdek et al., 2014), and only three studies had study therapists that were exclusive to the MI intervention (Syzdek et al., 2016; Westra & Dozois, 2006; Zanjani et al., 2008).

Post-intervention treatment attendance

Five studies reported minimal or no effect of MI as a pre-treatment, of which three recruited treatment-seeking participants (Baker et al., 2002; Martino et al., 2006; Simpson et al., 2010), and two recruited non-treatment-seeking samples (Syzdek et al., 2014, 2016). Simpson et al. (2010) found no significant difference between MI pre-treatment intervention and standard care groups in attending or completing post-MI treatments (all randomized: $p = .23$; all completers: $p = .13$). Martino et al. (2006) found that despite more participants from the MI pretreatment intervention attending more post-MI interventions (75% vs. 55%), they attended fewer sessions in the offered programme and had reduced attendance. There were no differences between the MI intervention and standard treatment mean days (19.16 vs. 19.09, respectively, $p = .66$) and no participant from either group remained in the programme at 12 weeks. The study by Baker et al. (2002) also found no difference in attendance to the offered treatment (16% vs. 17.3%), and reported that the control group attended a greater number of post- to pre-treatment sessions compared to the MI pretreatment group (5.79 vs. 4.46, respectively). Syzdek et al. (2014) found that there was no difference between the intervention and control group in help seeking from formal sources. However, the MI pre-treatment did facilitate the increase in informal help seeking from sources such as a parent (25% vs. 0%) or significant others (27% vs. 0%). Syzdek et al. (2016) found there was a significant increase at two-month follow-up for the MI group to seek informal help from a parent (45% vs. 8%), and a nonsignificant trend for the MI group to seek help from professional sources (39% vs. 8%).

Treatment effects

Six studies reported treatment effect sizes for various outcomes (see Table 5). Buckner and Schmidt (2009) reported small effects regarding those in the MI treatment condition and openness to the therapist over time ($w2 = 0.02$, $p = .02$). Westra and Dozois (2006) also reported a large effect on the anxiety change expectancy scale for those in the MI group ($d = 0.60$, $p < .05$), a large effect to

homework compliance (d = 0.96, p < .05), and a moderate effect on depressive symptoms (d = 0.64, p < .06) with the largest effect on those with generalized anxiety disorder (d = 1.29). Fiszdon et al. (2016) reported that MI pretreatment had a large effect on motivation to change immediately after the MI pretreatment (d = 1.49), and after the cognitive rehabilitation (d = 1.19). Seal et al. (2012) reported that MI had a large effect (Cohen's h = 0.74) regarding engagement in the offered post-MI treatment. Martino et al. (2006) reported a small effect in the reduction in primary drug use for both MI intervention and control (d = 0.47, and .44, respectively).

Syzdek et al. (2014) reported results from follow-up at one and three months. At one month, the MI had a small effect on depressive symptoms (d = 0.50), anxiety symptoms (d = 0.37) and the intention to seek formal help (d = 0.39). There were large treatment effects on problematic drinking (d = 0.81), and intention for informal help-seeking (d = −0.85), and a moderate effect on stigma (d = −0.64). However, these results were not statistically significant with the exception of informal help-seeking which approached significance (p = .07). At 3 months follow-up, there were moderate effects on depressive symptoms (d = 0.50), anxiety symptoms (d = 0.59) and informal help-seeking (d = −0.51), and were small effects on hostility (d = 0.22), problematic drinking (d = 0.45), stigma (d = 0.39) and intention to seek formal help (d = 0.28). However, these effects were not statistically significant. Syzdek et al. (2016) reported results at two months follow-up and found a small but significant effect on treatment seeking from informal sources such as parents (d = 0.40, p = .04), and a nonsignificant effect on formal treatment seeking (d = 0.35, p = .10). Several studies commented that effects may not have been attributable to MI alone. Seal et al. (2012) did not formally assess the MI intervention, while Fiszdon et al. (2016) added the extra element of providing feedback to their intervention while not measuring this effect on outcomes.

Meta-analysis

Twelve studies were included in the meta-analysis (Baker et al., 2002; Buckner & Schmidt, 2009; Korte & Schmidt, 2015; Maltby & Tolin, 2005; Martino et al., 2006; Seal et al., 2012; Simpson et al., 2010; Swanson et al., 1999; Syzdek et al., 2014, 2016; Westra & Dozois, 2006; Zanjani et al., 2008). Syzdek et al. (2014) reported health-seeking behaviours at both follow-ups, and therefore, only the first follow-up data for formal treatment-seeking behaviours were included in the analysis. Two studies were excluded because they only reported results on the number of post-MI sessions attended, rather than the number of individuals that attended (Fiszdon et al., 2016; Martino et al., 2000).

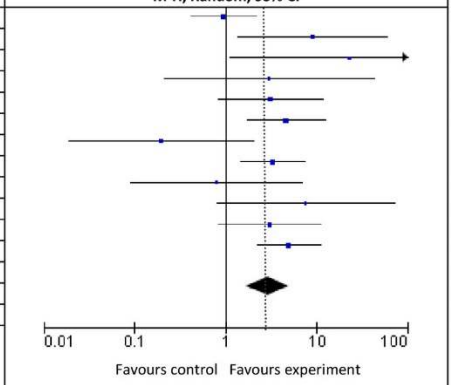
A total of 711 participants (359 intervention and 352 controls) were recruited in the 12 studies (Figure 2). Overall, heterogeneity was moderate (I2 = 46%, p = .04). Heterogeneity assessment by visual inspection of the vertical line from mid-points of the black diamond shows that Baker et al. (2002) and Simpson et al. (2010) did not intersect. Both studies reported no differences between intervention and control groups. The width of the CI was narrow and did not contain a zero value (95% CI: 1.69–4.98) and the OR revealed that participants in the MI intervention were more likely to attend offered treatment (OR = 2.90), with a significant effect size (Z = 3.87, p < .001). Subjectively, as the funnel plot is symmetrical, there is no evidence of publication bias (see Figure 3).

Figure 2: Forest plot: attendance to treatment

Whole sample

Study or Subgroup	Intervention		Control			Odds ratio
	Events	Total	Events	Total	Weight	M-H, Random, 95% CI
Baker et al. 2002	13	79	14	81	14.2%	0.94 [0.41, 2.16]
Buckner et al. 2009	7	12	2	15	5.9%	9.10 [1.39, 59.62]
Korte & Schmidt 2015	6	12	0	11	2.8%	23.00 [1.11, 477.46]
Maltby & Tolin 2005	3	7	1	5	3.5%	3.00 [0.21, 42.62]
Martino et al. 2006	19	24	11	20	9.3%	3.11 [0.83, 11.66]
Seal et al. 2012	21	34	10	39	12.3%	4.68 [1.73, 12.70]
Simpson et al. 2010	11	15	14	15	4.3%	0.20 [0.02, 2.02]
Swanson et al. 1999	30	64	12	57	14.4%	3.31 [1.48, 7.39]
Syzdek et al. 2014	2	12	2	10	4.8%	0.80 [0.09, 7.00]
Syzdek et al. 2016	7	18	1	13	4.5%	7.64 [0.81, 72.40]
Westra & Dozois 2006	21	25	19	30	9.5%	3.04 [0.83, 11.17]
Zanjani et al. 2008	40	57	18	56	14.5%	4.97 [2.24, 11.03]
Total (95% CI)		**359**		**352**	**100.0%**	**2.90 [2.24, 4.98]**
Total events	180		104			

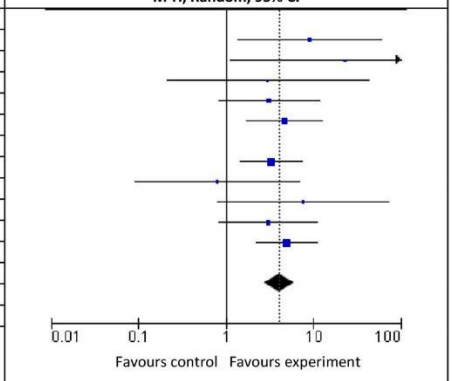
Heterogeneity: $Tau^2 = 0.36$; $Chi^2 = 20.24$, df = 11 ($p = 0.04$); $I^2 = 46\%$
Tests for overall effect: Z = 3.87 ($p = 0.0001$)



Whole sample: sensitivity analysis

Study or Subgroup	Intervention		Control			Odds ratio
	Events	Total	Events	Total	Weight	M-H, Random, 95% CI
Baker et al. 2002	13	79	14	81	0.0%	0.94 [0.41, 2.16]
Buckner et al. 2009	7	12	2	15	4.5%	9.10 [1.39, 59.62]
Korte & Schmidt 2015	6	12	0	11	1.7%	23.00 [1.11, 477.46]
Maltby & Tolin 2005	3	7	1	5	2.3%	3.00 [0.21, 42.62]
Martino et al. 2006	19	24	11	20	9.2%	3.11 [0.83, 11.66]
Seal et al. 2012	21	34	10	39	16.1%	4.68 [1.73, 12.70]
Simpson et al. 2010	11	15	14	15	0.0%	0.20 [0.02, 2.02]
Swanson et al. 1999	30	64	12	57	24.8%	3.31 [1.48, 7.39]
Syzdek et al. 2014	2	12	2	10	3.4%	0.80 [0.09, 7.00]
Syzdek et al. 2016	7	18	1	13	3.2%	7.64 [0.81, 72.40]
Westra & Dozois 2006	21	25	19	30	9.5%	3.04 [0.83, 11.17]
Zanjani et al. 2008	40	57	18	56	25.2%	4.97 [2.24, 11.03]
Total (95% CI)		**265**		**256**	**100.0%**	**4.04 [2.71, 6.04]**
Total events	156		76			

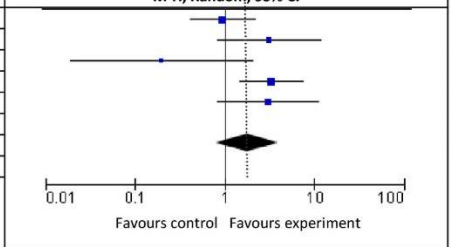
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 5.40$, df = 9 ($p = 0.80$); $I^2 = 0\%$
Tests for overall effect: Z = 6.83 ($p < 0.00001$)



Treatment seeking

Study or Subgroup	Intervention		Control			Odds ratio
	Events	Total	Events	Total	Weight	M-H, Random, 95% CI
Baker et al. 2002	13	79	14	81	26.7%	0.94 [0.41, 2.16]
Korte & Schmidt 2015	6	12	0	11	18.4%	23.00 [1.11, 477.46]
Martino et al. 2006	19	24	11	20	8.9%	3.11 [0.83, 11.66]
Simpson et al. 2010	11	15	14	15	27.2%	0.20 [0.02, 2.02]
Westra & Dozois 2006	21	25	19	30	18.7%	3.04 [0.83, 11.17]
Total (95% CI)		**207**		**203**	**100.0%**	**1.79 [0.81, 3.96]**
Total events	94		70			

Heterogeneity: $Tau^2 = 0.44$; $Chi^2 = 9.28$, df = 4 ($p = 0.05$); $I^2 = 57\%$
Tests for overall effect: Z = 1.44 ($p = 0.15$)



Nontreatment seeking

Study or Subgroup	Intervention		Control			Odds ratio
	Events	Total	Events	Total	Weight	M-H, Random, 95% CI
Buckner et al. 2009	7	12	2	15	8.0%	9.10 [1.39, 59.62]
Korte & Schmidt 2015	6	12	0	11	3.1%	23.00 [1.11, 477.46]
Maltby & Tolin 2005	3	7	1	5	4.0%	3.00 [0.21, 42.62]
Seal et al. 2012	21	34	10	39	28.6%	4.68 [1.73, 12.70]
Syzdek et al. 2014	2	12	2	10	6.0%	0.80 [0.09, 7.00]
Syzdek et al. 2016	7	18	1	13	5.6%	7.64 [0.81, 72.40]
Zanjani et al. 2008	40	57	18	56	44.6%	4.97 [2.24, 11.03]
Total (95% CI)		**152**		**149**	**100.0%**	**4.83 [2.84, 8.24]**
Total events	94		70			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 4.39$, df = 6 ($p = 0.62$); $I^2 = 0\%$
Tests for overall effect: Z = 5.79 ($p < 0.00001$)

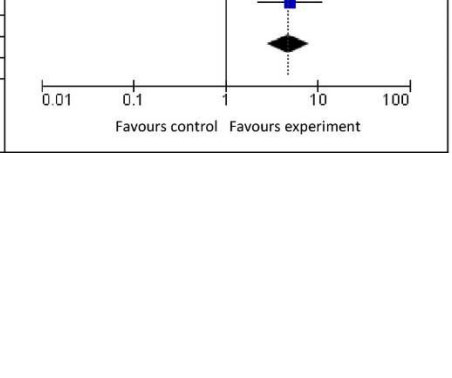
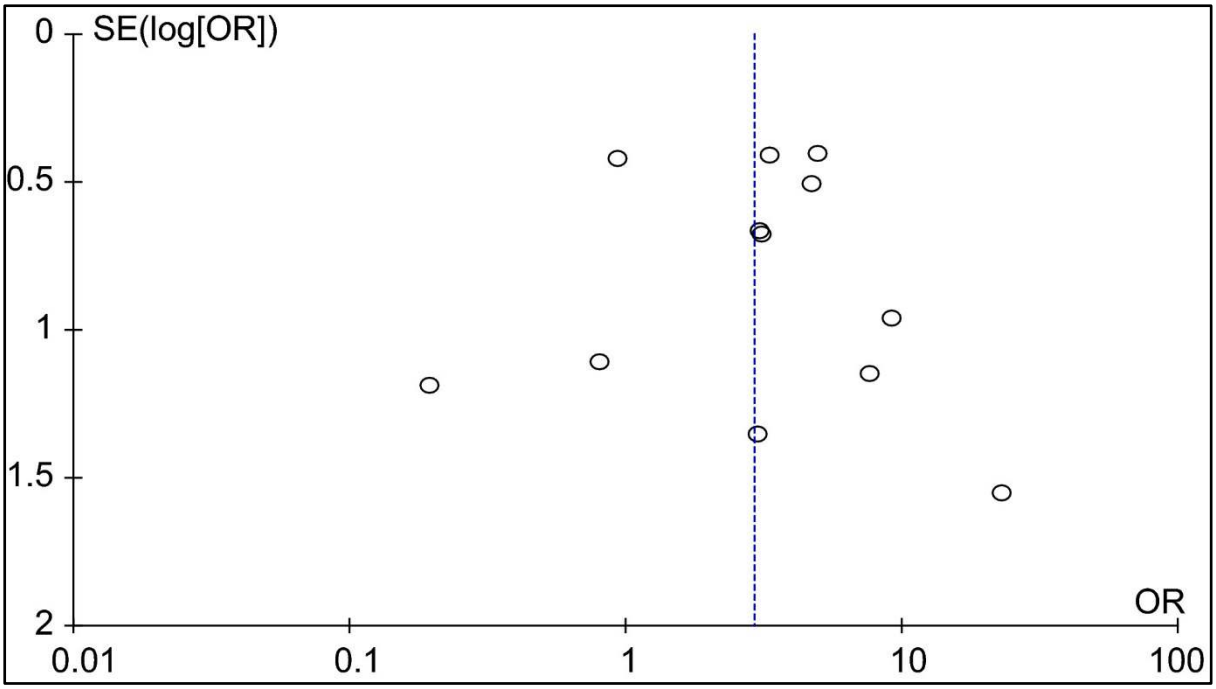


Figure 3: Publication bias



A sensitivity analysis was conducted and the data from Baker et al. (2002) and Simpson et al. (2010) was removed from a re-run of the analysis. The sample was homogenous (I2 = 0%), and participants who attended MI pre-treatment were more likely to seek post-MI treatment (OR: 4.04, 95% CI: 2.71–6.04), with a significant effect size (Z = 6.83, p < .001).

Subgroup meta-analysis

Treatment-seeking and non-treatment-seeking

Data were analysed by subgroups, treatment-seeking for mental illness and non-treatment-seeking for mental illness, to assess whether MI was an effective strategy in samples that were not already highly motivated. The treatment-seeking group included five studies (Baker et al., 2002; Martino et al., 2006; Simpson et al., 2010; Swanson et al., 1999; Westra & Dozois, 2006), with an overall sample of 410 participants (207 intervention group, 203 control group). Heterogeneity was substantial (I2 = 57%), and all confidence intervals intersected the line of no effect. The RE model revealed that although the intervention group was more likely to attend treatment (OR: 1.79, 95% CI: 0.81–3.96), the effect was not significant (Z = 1.44, p = .15). Within this sample, Simpson et al. (2010) reported an OR of 0.20 (95% CI: 0.02–2.02), and Baker et al. (2002) reported an OR of 0.94 (95% CI: 0.41–2.16), suggesting no effect for the MI intervention (refer to Figure 2).

Seven studies were included in the non-treatment-seeking analysis component (Buckner & Schmidt, 2009; Korte & Schmidt, 2015; Maltby & Tolin, 2005; Seal et al., 2012; Syzdek et al., 2014, 2016; Zanjani et al., 2008), with a smaller overall sample size (n = 301 participants; 152 in the intervention group and 149 controls). All confidence intervals intersected the line of no effect, and there was no heterogeneity (I2 = 0%) and the RE model revealed that the intervention group was more likely to

attend treatment (OR: 4.83, 95% CI: 2.84–8.24), with a large treatment effect size ($Z = 5.79$, $p < .001$) (see Figure 2).

DISCUSSION

This is the first systematic literature review and meta-analysis to analyse the effectiveness of MI as a pre-treatment in terms of its effect on post-intervention attendance to treatment. MI was most beneficial for samples that were not seeking treatment for mental health problems. The non-treatment-seeking intervention group was homogenous and almost five times more likely to attend post-MI treatment than samples that were treatment seeking. This is comparable to a meta-analysis by Hettema et al. (2005), which concluded that MI may be contraindicated for individuals ready for change due to them already being at a high level of motivation and within the preparation or the action stage of the change cycle. The rationale behind MI is that it raises an individual's ambivalence, taking into account their stage of change, to move that individual to the next stage by enhancing their perceived need for change, and increasing their motivation to change (Prochaska et al., 1992). Those not seeking treatment may be at the precontemplation or contemplation stage, and MI can assist them to increase their motivation to change by exploring ambivalence. An individual's perceived need is the strongest predictor of the use of mental health services (Mills et al., 2012) and the more severe the mental illness, the higher was the perceived need (Andrade et al., 2014). An individual's attitude is an important barrier to initiating and engaging in treatment, where attitudinal barriers are highly prevalent in mild and moderate cases of mental illness (Andrade et al., 2014). Public and personal stigma are known barriers to seeking treatment in some studies (Corrigan et al., 2006).

Individuals already seeking treatment may have complex treatment needs, and although MI pre-treatment motivated participants to attend post-MI interventions, participants were not motivated for continued attendance, nor were participants fully engaged with the treatments offered (Baker et al., 2002; Fiszdon et al., 2016; Simpson et al., 2010). This may suggest that either the post-MI treatments were unsuitable for the individual, motivation to attend these interventions needed to be maintained with MI booster sessions, or there were other influencing factors that went unmeasured. Booster sessions, or multi-contact interventions, may help to maintain the impact of the MI intervention on the intended behaviours or therapeutic goals, especially in the long term (Aseltine, 2010). In our review, although there was a wide range of MI intervention intensity between different groups, a brief telephone intervention for as little as 15 min on two occasions was effective in motivating participants to attend post-MI therapy (Zanjani et al., 2008). Although MI was originally developed as a counselling style to be delivered in-person, other studies have also demonstrated the efficacy of MI as a telephone-delivered intervention (Gaume et al., 2014; Mello et al., 2008, 2012). Gaume et al. (2014) tested telephone MI on a sample of men from the emergency department who were not seeking treatment for heavy alcohol consumption. They found that MI delivered by telephone was an effective treatment for this sample in reducing alcohol consumption.

Telephone interventions provide a novel method to provide mental health support and are a relatively low cost and a contextually appropriate tool for use in healthcare settings, particularly when fiscal considerations are paramount (Kaplan, 2006) and have the potential to keep patients motivated to attend further treatments. They also have the potential to reach populations that may not be able to access effective interventions for their mental illness symptoms (Kazdin & Rabbitt, 2013) and do not have the limitations of computer-based interventions, which may be restricted due to Internet access and its unreliability in remote areas (Harrison et al., 2011). Several studies have demonstrated that psychological therapies delivered by telephone were as effective as face-to-face treatment (Mohr et al., 2008), therapeutic alliance was comparable, and participants were satisfied

with this model of delivery (Jenkins-Guarnieri et al., 2015). As MI appears to be effective for populations that are not seeking treatment for their mental illness, opportunistic health service presentation represents a time when patients may be amenable to an intervention (Drummond et al., 2014; Woodruff et al., 2013). Screening and referral to treatment in settings other than those concerned with mental health may be viable. Using motivation techniques like MI may be a novel approach in engaging patients to attend further treatment.

Limitations

The studies included in this review were generally sound in design and execution. However, common weaknesses were limited explanation of the extent of blinding, small sample sizes and the general lack of data relating to MI intervention quality and its relationship to the effects of treatment, despite most studies stating that the MI interviews were assessed. Two studies reported that recruitment methods may have influenced the results through unintentionally recruiting a sample which was already high in motivation (Buckner & Schmidt, 2009; Maltby & Tolin, 2005) and it was therefore difficult to ascertain whether the MI intervention had a true effect on motivation levels. Selection bias can compromise study design and reduce reliability of the results (Akobeng, 2005). Bias was also introduced into studies by the limited blinding of both research personnel and study participants. Blinding research personnel to treatment allocation reduces selection bias by preventing researchers from influencing group assignment, whether consciously or unconsciously (Akobeng, 2005) and investigators that are not blinded to treatment allocation can transfer their attitudes for or against an intervention to participants (Schulz & Grimes, 2002). Two studies explicitly stated there was only one therapist conducting both the control and intervention (Martino et al., 2006; Simpson et al., 2010). Inadequate blinding of participants can affect expectations, reporting of symptoms, and can increase their trepidation and study withdrawal (Devereaux et al., 2002; Schulz & Grimes, 2002). Literature reviews have also indicated that where allocation concealment was either inadequate or unclear, studies reported larger treatment effects where OR can be increased by 30% to 41% (Schulz et al., 1995).

Sample size has an important influence on study quality (Smith & Beh, 2012), with small sample sizes having limited power to detect the true effect of an intervention, which may lead to false positive results (Button et al., 2013). No study reported a power calculation for sample size requirements; however, the samples recruited in these studies represent a population of interest and several of the studies were pilot studies to determine feasibility of an MI intervention (Buckner & Schmidt, 2009; Martino et al., 2006; Simpson et al., 2010; Syzdek et al., 2014, 2016). Due to the low reporting of the outcomes of treatment fidelity measures, type 1 error may occur due to unknown factors which may have influenced the results. Similarly, type 2 error could occur where researchers report nonsignificant results of an intervention which may be effective (Borrelli, 2011). Without treatment assessment, it is difficult to ascertain causal effects and whether there were other influences on the results other than the actual MI treatment, such as individual interaction styles, characteristics of the therapist and the study participant. These differences can be assessed through audio- or video-recorded sessions evaluated with a validated tool such as the MITI by an independent rater (Borrelli, 2011). Treatment fidelity measures the process by which the MI was delivered. Measuring process ensures the MI is delivered according to the treatment principles and can measure variability between therapists (Rubin et al., 2001). As a quality indicator, researchers can state that the "motivational interviewing was conducted according to techniques described by Miller and Rollnick." Otherwise, it would be more equivalent to a motivation style counselling, which is also shown to be beneficial in this review.

Implications for mental health nursing

Mental health nurses have the opportunity to increase patient attendance to inpatient and outpatient therapies using MI as a pretreatment which enhances intrinsic motivation within the patient. All Interactions between mental health nurses and mental health patients can be viewed as an opportunity for health promotion, even if the time of these interactions seems brief. Mental health nurses can use the techniques of MI with unmotivated patients to increase health-seeking behaviours, increase treatment attendance and potentially forestall undesired health outcomes within this patient sample.

This review of the literature provides evidence for the use of MI for samples which are not seeking treatment for mental health problems. Although the review focused on mental health settings, MI can be used by clinicians in all health settings to promote and facilitate behaviour change particularly for patients that are resistant or ambivalent to change. Although causal links to the success of MI have not been clearly demonstrated in various literature reviews focussing on mental health conditions, the outcome measure of treatment attendance demonstrates the feasibility of using MI as a health promotion tool. Particular attention can be given to delivering MI by telephone to keep patients motivated to attend mental health appointments and further treatment. Telephone-delivered MI is a viable low-cost option in promoting continued mental health care and is a novel approach to mental health treatments.

CONCLUSIONS

This systematic review and meta-analysis revealed that MI is an intervention which can be used at opportunistic healthcare presentations for patients that are not seeking treatment for their mental ill-health. Due to MI principles, trained therapists can diminish an individual's ambivalence regarding health-promoting behaviours and help motivate change. As process measures are underreported in the research and difficult to ascertain the causal links to outcomes, outcome measures like treatment attendance can indicate the quality and the success of the intervention. Future research which utilizes MI should report the process in which the MI was delivered to ensure the treatment is in line with the principles of MI and called be called thus; otherwise, it is difficult to determine which factors in the therapeutic alliance were the causal factors for change.

IMPLICATIONS FOR PRACTICE

Mental health nurses are ideally placed to increase patient attendance to inpatient and outpatient therapies by using MI as a pre-treatment which enhances intrinsic motivation within patients. All Interactions between mental health nurses and mental health patients can be viewed as an opportunity for health promotion, even if the time of these interactions seems brief. Mental health nurses can use the techniques of MI with unmotivated patients to increase health-seeking behaviours, increase treatment attendance, and potentially forestall undesired health outcomes within this patient sample.

RELEVANCE STATEMENT

Although mental health issues are highly prevalent in the community, many individuals do not actively seek treatment. In healthcare settings, these patients present across many clinical areas and are not exclusive to mental health settings. For health professionals, each interaction with a patient, no matter how brief, represents an opportunity for health promotion and techniques such as MI for individuals not seeking treatment for a mental illness are shown to be effective in promoting health-seeking behaviours for this condition. In mental health settings, nurses can help to promote mental

well-being by motivating out-patients to seek further assistance for their mental health problems. In any setting, MI delivery by telephone may be a feasible, low cost option.

Notes :

ASI, Anxiety Sensitivity Index; AUDIT, Alcohol Use Disorders Identification Test; DUKE, DUKE Health profile (anxiety and depression subscale); NR, Not Reported; PHQ, Patient Health Questionnaire; PRIME MD, Primary Care Evaluation of Mental Disorders; PTSDC-MV, Post-traumatic Stress Disorder Checklist – Military Version; SCID DSM, Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders; SIAS, Social Interaction Anxiety Scale; Y-BOCS, Yale-Brown Obsessive Compulsive Disorder Scale.

DDMI, dual diagnosis motivation interview; GBMI, Gender-based motivational interview; MITI, Motivational Interview Treatment Integrity; TBR-CM, telephone-based referral care management.

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