Beyond face-to-face individual counseling: A systematic review on alternative modes of motivational interviewing in substance abuse treatment and prevention

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ABSTRACT

Objectives: This systematic review aimed to synthesize the evidence on the effectiveness of motivational interviewing (MI), delivered in modes other than face-to-face individual counseling, in preventing and treating substance abuse related behaviors.
Methods: Four databases (PubMed/MEDLINE, PsycINFO, ISI Web of Science and Cochrane Library) were searched for randomised clinical trials (RCTs) that evaluated the effectiveness of alternative modes of MI (other than face-to-face individual counseling) in preventing and treating substance abuse. Eligible studies were rated on methodological quality and their findings were qualitatively synthesized.
Results: A total of 25 articles (on 22 RCTs) were eligible for this review. Beyond face-to-face counseling, telephone was the most frequently used medium for delivering MI (11 studies), followed by Internet communication (4 studies) and short message service (SMS) (2 studies). Mail was incorporated as a supplement in one of the studies for telephone MI. In contrast to one-to-one individual counseling, group MI was adopted in 5 studies. The effectiveness of telephone MI in treating substance abuse was supported by all of the published RCTs we located. Internet-based MI was effective in preventing and treating alcoholism, but its outcome appeared to be inconsistent for smoking cessation and poor for abstinence from illicit drugs. SMS-based MI appeared to be useful for controlling tobacco and drinking. Group MI was attempted for quitting alcohol and drugs, with mixed findings on its outcomes.
Conclusions: Collectively, the studies reviewed indicate that telephone MI is a promising mode of intervention in treating and preventing substance abuse. The effectiveness of other alternative modes (SMS-based MI, Internet-based MI and group MI) remains inconclusive given the controversial findings and a limited number of studies. By synthesizing the currently available evidence, this systematic review suggested that telephone MI might be considered as an alternative to face-to-face MI for treating and preventing substance abuse. Further research is needed to investigate the effectiveness of SMS-based MI, Internet MI, group MI and other alternative modes. Studies with methodological rigor and incorporating MI fidelity measures have great potential to advance the understanding in this field.

1. Introduction

Substance use disorders, commonly known as substance abuse and substance dependence, are defined as "a cluster of cognitive, behavioral, and physiological symptoms indicating that the individual continues use of the substance despite significant substance-related problems" (American Psychiatric Association, 2013). It was estimated by the United Nations that 162 million to 324 million people aged 15-64 years (3.5% to 7.0% of the global population) have used an illicit drug, whereas approximately 183,000 drug-related deaths were reported

(United Nations Office on Drugs and Crime, 2014). Use of tobacco and alcoholism are other two common substance abuse problems. World Health Organization (WHO) indicated that more than 208 million people suffered from alcoholism (WHO, 2014). The harmful use of alcohol is considered as one of the top five risk factors for disease, disability and mortality (Lim et al., 2012; WHO, 2011a). It causes around 3.3 million deaths per year, accounting for 5.9% of all deaths (WHO, 2014). It was also reported that 21% of the world's population aged 15 years and older smoked tobacco (WHO, 2015). Around 6 million deaths every year are the result of direct tobacco use or being

exposed to second-hand smoke (WHO, 2011b). In general, substance abuse remains a serious problem worldwide and deserves further administrative, academic and public attention.

Motivational interviewing (MI) is a collaborative conversation style for strengthening a person's own motivation and commitment to change (Miller & Rollnick, 2013). It was initially introduced for treating substance abuse and was later expanded to changing many other health-related behaviors (Emmons & Rollnick, 2001; Miller, 1983; Resnicow et al., 2002). MI is typically done in one-to-one counseling through face-to-face sessions (Miller & Rollnick, 2009). Individual face-to-face MI has proven to be an effective method for helping people cut down or stop using drugs, alcohol and tobacco. A systematic review and meta-analysis showed that face-to-face MI had a stronger effect in treating substance abuse as compared with negative controls, although the difference was not significant when compared with treatment as usual or at long-term follow-ups (Smedslund et al., 2011).

Despite its encouraging effectiveness, face-to-face individual MI is considered labor-intensive, time-consuming and impractical under some circumstances (Carey, Scott-Sheldon, Elliott, Garey, & Carey, 2012). Other modes of MI have been explored as alternatives and are believed to have several theoretical advantages. Using telephone and Internet as alternative media of communication, access to hard-to-reach groups may be easier and it creates better privacy and less embarrassment in some cases (Bennett, Young, Nail, Winters-Stone, & Hanson, 2008; Picciano, Roffman, Kalichman, & Walker, 2007; Roffman et al., 1997; Tate & Zabinski, 2004). In addition, Internet communication may be particularly relevant among younger generations since it has become an important channel that they interact with the world (Escoffery et al., 2005). In contrast to individual counseling, group MI has been introduced to engage more than one client suffering from the similar substance-related problems and is supposed to be potentially cost-effective and more efficient (Naar-King & Suarez, 2011). The assumptions on the potential of alternative modes of MI need to be tested in empirical studies. To the best of our knowledge, there is no published review on the effectiveness of alternative modes of MI. This review aims to systematically search for and synthesize the existing evidence collected through randomized controlled trials (RCT) on the effectiveness of alternative modes of MI in preventing and treating substance abuse.

2. Methods

2.1. Search strategy

This systematic review was conducted and reported by following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). Four scientific databases (PubMed/MEDLINE, PsycINFO, ISI Web of Science and Cochrane Library) were searched for papers published between January 1983 (the year when MI was developed) and January 2016. Only human studies published in English language were included. The following search keywords were used: (motivational interview*) AND (group OR family OR telephone OR phone OR email OR internet* OR computer* OR online OR web-based OR text-based OR mail OR short message service OR format OR delivery OR mode* OR media OR medium) AND (substance abuse OR substance use OR addiction OR addictive OR alcohol* OR smoking OR tobacco OR drug*).

2.2. Study selection and data extraction

A study was included if it met the following criteria simultaneously: 1) it was an interventional study using a RCT design; 2) MI was included in at least one of the intervention groups; 3) the intervention included at least one alternative mode of MI that is beyond face-to-face individual counseling; and 4) the intervention targeted prevention or treatment of at least one type of substance abuse. A study was excluded

if it fell into the following categories: 1) commentary, editorial or review; 2) paper on MI training or methodology; 3) study protocol; 4) case report; 5) observational study; 6) interventional study which was not a RCT; 7) unrelated to substance abuse; 8) not about MI; and 9) no other mode of MI. If family members or other people are involved in the MI session, which however was only for changing one individual participant's behavior, the study was excluded. Also, if the alternative media (e.g. internet and telephone) were used only as a supplement after face-to-face MI or as a "booster" after face-to-face counseling, this study was excluded.

All retrieved papers were first screened based on their titles and abstracts. Potentially eligible full-text articles were obtained and were carefully assessed for eligibility. Addition records were also obtained by referring to the bibliographies of the retrieved papers. A data extraction proforma was prepared to record the key information of each RCT (source, target behaviors, studying sample, interventions, modes of MI, dose of MI, counselor background, MI training and supervision, MI fidelity measure, length of follow-up, attrition rate and main findings).

2.3. Quality assessment

The revised 2010 CONSORT (Consolidated Standards of Reporting Trials) guidelines was used for rating the quality of the identified RCTs into a checklist of 25 items. One point was given if the study met the criterion stipulated in each item. Among the 25 items, 12 were assessed by considering two subitems (i.e. a and b). A score of 0.5 was given for each subitem fulfilling the criterion or not applicable for the article, so that the total score for that item remained as 1. The total quality scores of each RCT were calculated. The possible total score ranged from 0 to 25, with a higher score indicating a better quality of the study. In addition, the number of RCTs fulfilling each criterion was calculated to identify common weak areas in trial design and reporting.

2.4. Inter-rater reliability and resolution of disagreement

Two reviewers (SJ and LW) independently screened the titles and abstracts of the retrieved records, assessed the eligibility of the full articles, and rated the scientific quality of the studies. Whenever there was a disagreement, it was resolved by discussion. If a consensus could not be reached, opinions were sought from the third person (XG). Kappa statistic was used to test inter-rater reliability in screening of record, assessment of eligibility, and quality rating.

3. Results

3.1. Study selection

The search strategy yielded 1207 records after the removal of duplicate papers retrieved from more than one database. Among them, 1139 papers were excluded during screening stage for various reasons (listed in Fig. 1). The remaining 68 full articles were carefully assessed and 43 were subsequently excluded. At last, 25 papers (22 studies) were included in this review. The inter-reviewer reliability was high for both the screening and full assessment process (kappa = 0.83 and kappa = 0.86, respectively).

3.2. Quality of studies

The inter-rater reliability for assessing the quality of studies was high (kappa = 0.88). The CONSORT score varied from 9.0 to 23.5 out of a highest possible quality score of 25 (Table 1). The mean (SD) quality score was 15.5 (3.8). Twelve out of the 25 papers had a quality score of 15 or above. The number of papers fulfilling each quality criterion ranged from 2 to 25. Ten out of 25 quality criteria were met in half or more studies. Common weak areas in trial design and reporting were lack of sample size justification (13 articles), insufficient informa-