Patient Education and Counseling 84 (2011) 16–26

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Review

A systematic review of motivational interviewing training for general health care practitioners

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ARTICLE INFO

Article history:
Received 22 December 2009
Received in revised form 18 May 2010
Accepted 20 June 2010

Keywords:
Motivational interviewing
Education
Behaviour change
Counselling

ABSTRACT

Objective: This article systematically reviews empirical studies that have evaluated different aspects of motivational interviewing (MI) training for general health care professionals.
Methods: Studies were obtained from several databases. To be included, the MI training had to be provided specifically for general health care practitioners for use in their regular face-to-face counselling. The training outcomes had to be linked to the MI training.
Results: Ten studies were found. The median length of the training was 9 h. The most commonly addressed training elements were basic MI skills, the MI spirit, recognizing and reinforcing change talk, and rolling with resistance. Most studies involved follow-up training sessions. The study quality varied considerably. Five studies assessed training outcomes at a single point in time, which yields low internal validity. Four studies used random assignment of practitioners to the MI training and comparison conditions. The training generated positive outcomes overall and had a significant effect on many aspects of the participants' daily practice, but the results must be interpreted with caution due to the inconsistent study quality.
Conclusions: The generally favourable training outcomes suggest that MI can be used to improve client communication and counselling concerning lifestyle-related issues in general health care. However, the results must be interpreted with caution due to inconsistent methodological quality of the studies.
Practice implications: This review suggests that MI training outcomes are generally favourable, but more high-quality research is needed to help identify the best practices for training in MI.

1. Introduction

In the past 25 years, there has been increasing emphasis on preventive practice in primary health care settings as lifestyle has been identified as a key factor in improving the health status of the population. Research findings have linked lifestyle behaviours such as physical inactivity, poor dietary habits, tobacco use, and excessive alcohol consumption with increased risk of morbidity and mortality [1]. Motivational interviewing (MI) has emerged as a promising counselling approach that has been successfully applied to a broad range of lifestyle issues in various contexts [2]. Most people hold conflicting motivations for change [3] and MI assumes that the responsibility and capability for change lies within the client [4]. First described in 1983 by William R. Miller, MI evolved from experience with treatment of alcoholics [5]. MI has gathered increasing empirical support as an effective counselling method for addressing many health-related problems, with the best results having been observed for alcohol-related problems [6–11].

Although MI was first developed and applied for substance abuse issues, the approach has become increasingly popular in general health care settings [12,13]. Many factors have contributed to the wide implementation of MI. The scientific evidence base for MI is growing, yet the primary appeal of the method may be its wide application in many different behavioural domains and client categories. MI is considered to be compatible with many different treatment approaches, which permits its integration into many clinical practices [14,15]. MI can be used as a brief intervention, which is important for its use in many settings where there are time constraints [2]. Ball et al. [16] report that health professionals find MI intuitively appealing because they tend to view the MI principles and skills as consistent with how they work, that is, they consider themselves to be highly empathic, reflective, and collaborative with clients.

The demand for professional training in MI has grown steadily [17,18]. Most MI training for health care practitioners is provided in the form of workshops lasting 1–3 days. Such workshops typically include an introduction to the philosophy and principles of MI, demonstration of the method, and guided practice in

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doi:10.1016/j.pec.2010.06.025

learning the skills [19]. However, MI is not a simple counselling approach to master [20] and Forsberg et al. [21] suggest that the complexity of developing sufficient competence in conducting MI counselling is an important barrier to transferring the training into practice. Although training often helps to develop new MI skills, research suggests that it may be difficult to suppress prior counselling habits, including practices that may be inconsistent with MI [22,23]. Walters et al. [24] have shown that MI competence tends to decay quickly unless there is some systematic post-training support, supervision or training. Several researchers have emphasized the importance of conducting more research to evaluate MI training efforts to investigate how and the extent to which trainees incorporate MI into their clinical practice [3,25,26].

This study systematically reviews studies that have evaluated different aspects of MI training for general health care professionals. The aim is to investigate the content and outcomes of MI training for professionals in general health care. Previous systematic reviews on MI training have investigated the outcomes of different types of MI training for use in addiction treatment [24] and the content but not the outcome of MI training in different health care professions [18]. The present study addresses a critical knowledge gap in MI research by analysing the MI training content and the outcome for general health care practitioners. This is important as a result of the increasing use of MI in general health care settings.

2. Methods

2.1. Inclusion criteria

This systematic review considered studies that assessed outcomes of health care practitioners' training in MI. Studies were considered that described MI training for practitioners in general health care, for example, physicians, nurses, and dieticians. General health care was operationalized to include the first tier of health provision, that is, primary-care level facilities covering a broad range of patients presenting with various problems and which can be accessed on demand by patients [27]. Studies that enrolled students or practitioners working in specialist care settings, such as substance abuse treatment or mental health facilities, were not considered.

The following inclusion criteria were used:

1. The training focused specifically on MI, in accordance with descriptions by Miller and Rollnick [28].
2. The study contained a sufficiently detailed description of the MI training, providing an overview of the training environment, methods used, duration, population trained, and outcomes.
3. The MI training was specifically provided for ordinary general health care practitioners who planned to use or were already using MI skills in their regular face-to-face counselling with patients/clients in general health care.
4. The study was published in English.

2.2. Search strategy and review process

The studies for this review were obtained through database searches up to May 2010. Searches were made in the following electronic databases: Amed, Cinahl, Eric, psycINFO, Medline databases, and Scopus. We used the following terms or relevant combinations thereof: "MI", "training", and "education". We also conducted a thorough review of the bibliography page on the Motivational Interviewing Network of Trainers website [29] and examined the reference lists of selected publications and the two previous systematic reviews [18,24] to identify additional studies.

This search process yielded 97 potentially eligible abstracts. The first author of the study screened all 97 abstracts against the inclusion criteria to determine which papers were eligible for inclusion. This abstract screening process produced 22 articles for potential inclusion. The 75 excluded studies did not meet one or more of the inclusion criteria, as many were conducted in specialist settings or involved specialized MI-trained therapists or students. The remaining 22 articles were obtained and read in full by the first and last author of this review. Following a close inspection against the inclusion criteria, 11 articles reporting results from 10 studies were selected for inclusion in this systematic review.

Analysis of the studies was performed as a structured review of each study. Data pertaining to the following aspects were extracted from the studies and entered into a data table. The first and last author constructed the table. The following aspects were extracted:

participants (number of participants and professional categories);
intended MI use (e.g. alcohol or diabetes counselling);
setting and country;
study design;
training characteristics, including number of sessions, follow-up sessions, duration, type of training;
training content (see later Section 4.1);
MI training outcomes (see later Section 4.1), including details on data sources; and key findings.

The MI training content was categorized according to the eight stages for becoming competent in the clinical use of MI described by Miller and Moyers [30]: (1) becoming familiar with the MI spirit (i.e. the style or intention of the counsellor's disposition with the client, which emphasizes collaboration, evocation, and autonomy); (2) acquiring basic MI skills to become proficient in the ability to use open questions, affirm the client's responses, apply accurate reflections and provide summaries when necessary; (3) recognizing and reinforcing change talk; (4) eliciting and strengthening change talk; (5) rolling with resistance to avoid confrontations and argumentation; (6) developing a plan, which may be initiated by the client and counsellor asking "what next?"; (7) helping the client to commit to the change plan; and (8) ability to switch between MI and other intervention styles.

Studies that mentioned training in basic MI or its principles were categorized as addressing stages 1, 2, 3, and 5, in accordance with the procedure described by Madson et al. [18]. The descriptions of the MI training were used as presented in the studies, but we also approached the main author of all studies to verify the precise content of the training and obtain additional data where needed. This resulted in verification of the stages in four studies [23,31–33] and a minor revision in one study [34]. As the authors of five studies could not be reached for input, we had to rely on the descriptions given in the studies.

MI training outcomes were classified into four categories, based on the basic structure of Kirkpatrick's widely applied training evaluation model, originally published in 1959 [35]: (1) participants' reactions to the different aspects of the training (e.g. the extent to which participants felt the training was applicable to their everyday clinical practice); (2) MI competence (e.g. did the training yield greater empathy and improved ability to use MI elements?); (3) clinical use of MI (e.g. did the training change professional behaviour concerning the use of MI elements in routine practice and what barriers to using MI existed?); and (4) patient health outcomes (e.g. effects on patients' weight and dietary habits). Our category (1) is essentially the same as Kirkpatrick's "reaction" level, that is, what course participants

Table 1
Assessment of methodological quality.

Study quality aspects	Handmaker, et al. [39]	Saitz et al. [41]	Velasquez et al. [4]	Broers et al. [34]	Rubak et al. [33][a]; Rubak et al. [38][b]	Brug et al. [40]	Casey [31]	Lane et al. [32]	Lindhe Söderlundet al. [43]	Sargeant et al. [42]
Study population and setting	+	+	+	+	+	+	+	+	+	+
Recruitment of study participants for the MI training	+	+	+	+	+	+	+	+	+	+
Study participation (or refusal) rate in the MI training	+	+	–	+	+	+	NR	+	NR	–/NR
Analysis of differences between participants and non-participants in the MI training	NR	–	–	–	–	NR	NR	–	NR	–/NR
Power analysis	–	–	–	–	+	–	NR	+	NR	–/NR
P-values	+	–	–	+	+	+	NR	+	NR	–/NR
Validated outcome instruments	–	+	–	–	+	+	NR	+	NR	–/NR
Study design	Level 5	Level 1	Level 1	Level 2	Level 5	Level 5	Level 1	Level 5	Level 1	Level 1

Note: Sargeant et al. [42] included a quantitative questionnaire study and a qualitative interview study, which were assessed independently.

[a] Reported on MI competence and clinical use.

[b] Reported on patient health outcomes.

think and feel about the training. Category (2) closely resembles Kirkpatrick's "learning" level, defined as participants' changes in attitudes, knowledge, and skills as a result of attending a course. Category (3) is similar to Kirkpatrick's "behaviour" level, which involves assessment of the extent to which participants change their behaviour back in the workplace as a result of the training. Category (4) is inspired by Kirkpatrick's "results" level, and can be defined as the final results that occurred because the participants attended the training; this outcome is typically the reason for having the course.

2.3. Assessment of methodological quality of the studies

A checklist consisting of seven questions was constructed by the first and last author for the purpose of this study in order to assess reporting and methodological quality of the included studies: (1) Were the study population and setting clearly described? (2) Was the recruitment of general health care professionals who participated in the MI training clearly described? (3) Was the MI training participation (or refusal) rate reported? (4) Were differences between the general health care professionals who participated in the MI training and those who did not participate or dropped out analyzed to allow for assessment of the degree to which the participating MI trainers were representative of the broader population of MI trainers in general health care? (5) Was a power analysis concerning the MI training recruitment reported? (6) Were *p*-values reported? (7) Did the study use any validated instrument(s) for MI training outcome measurement(s)? The assessments are reported in Table 1 as "+" for affirmative answers, "–" for negative answers to these questions, and "NR" when the assessment is not relevant, e.g. reporting a power analysis for an interview study or reporting a response rate when participation was 100%. Sargeant et al. [42] included both a quantitative questionnaire study and a qualitative interview study, which were assessed independently.

The study design of the individual studies was assessed using the Maryland Scale of Scientific Methods (MSSM) [36], which has been widely applied in systematic reviews [37]. The MSSM describes five levels of designs which are ranked in terms of their ability to handle threats to internal validity, from the lowest to the highest internal validity: (level 1) correlation between an intervention and an outcome at a single point in time; (level 2) temporal sequence between the intervention and the outcome clearly observed or the presence of a comparison group without demonstrated comparability of the intervention group; (level 3) intervention comparison between two or more comparable units of analysis, one with and one without the intervention; (level 4) intervention comparison between multiple units with and without the intervention, controlling for other factors or using comparison units that evidence only minor differences; (level 5) random assignment of comparable units to intervention and comparison conditions. The level for each study is reported in Table 1.

Working independently, the first and last author of the study examined the quality of the different aspects of the studies. The assessments of the first and last author were then compared and discussed before a conclusive quality assessment was made.

3. Results

3.1. Study characteristics

Ten studies were found to assess the effectiveness of MI training for practitioners in general health care and were included for analysis in this review (Table 2). Study results were published in 11 papers between 1999 and 2009, most in the last 4 years. Results from one of the studies were published in two separate papers

Table 2
Characteristics of the studies and training details.

Study	MI training Participants	Intended use of MI	Setting, country	Study design and data collection	Training characteristics [total time in hours]	Training content
Handmaker et al. [39]	30 Obstetric care practitioners (incl. 10 physicians, 8 certified medical assistants, 8 nurses)	Alcohol counselling with pregnant women.	Maternity care, USA	Random allocation of participants to MI training and comparison condition Random allocation to (1) MI training (20-min MI video) and (2) 20-min video described as "docudrama developed as an intervention for pregnant alcohol and substance abusers." Pre- and post-training role play with an actress playing a drinking pregnant woman	20-min video instruction of MI (0.33 h)	1, 2
Saitz et al. [41]	87 Physicians, nurses, psychologists, physician assistants, and social workers	Abuse-related counselling in general health care	Community health centres and hospital-based primary-care centres, USA	Correlation between MI training and outcome at a single point in time Questionnaire was answered by participants months (unspecified) to 5 years after the training	4-h workshop (given on four occasions over 5 years) (4 h)	2
Velasquez et al. [4]	76 Public health nurses and social work case managers	Smoking counselling	Miscellaneous health care organizations: prenatal clinics, health maintenance organization, home visitation programme, USA	Correlation between MI training and outcome at a single point in time Questionnaire was answered by participants post-training. Not clarified when or how aspects of the participants' clinical use of MI were investigated	Site A: 1-day workshop (≥8 h); site B: 2-day workshop (≥14 h); site C: 6-h workshop (≥6 h); follow-up training and monitoring of MI use differed among the three sites	1, 2, 3, 5
Broers et al. [34]	19 Physicians	Medication adherence	Primary care, The Netherlands	Temporal sequence between the MI training and the outcome Questionnaires were answered on three occasions: pre-training (T0), directly after training (T1), and 4–10 months after the training (T2)	2 × 4.5-h workshops (1.5–4 weeks apart), with one optional motivational feedback appointment on the basis of a videotaped MI counselling session (≥9 h). Training was based on BCC	1, 2, 3, 4, 5, 6
Rubak et al. [33][a]; Rubak et al. [38][b]	76 Physicians	Diabetes counselling	Primary care, Denmark	Random allocation of participants to MI training and comparison conditions Random allocation to (1) MI training and (2) control group who did not receive this training. A third group ("external group") had participated in similar MI training 2 years previously. Measurement 1 year after MI training (i.e. 3 years after the MI training for the "external group")	1.5-day workshop, with 2 × 0.5-day follow-up during the first year (20 h)	1, 2, 3, 4, 5, 6, 7
Brug et al. [40]	37 Dieticians	Diabetes counselling	Home-care organizations, The Netherlands	Random allocation of participants to MI training and comparison condition Random allocation to (1) MI training and (2) control group who received no training. Measurement within 1 month and 5–6 months after the training	2-Day workshop and 1 day follow-up 2 months later, then on-demand feedback and advice on MI issues for 4 more months (≥24 h)	1, 2, 3
Casey [31]	7 Nurses	Smoking counselling	Acute care, Ireland	Correlation between MI training and outcome at a single point in time Interviews were conducted 2 months after the training	1-Day workshop (8 h). Training was based on AMI, a shortened version of MI which was applied to account for time restrictions in clinical practice	1, 2, 3, 4, 5

Table 2 (*Continued*)

Study	MI training Participants	Intended use of MI	Setting, country	Study design and data collection	Training characteristics [total time in hours]	Training content
Lane et al. [32]	70 Health care professionals (unspecified)	Diabetes counselling	Primary care, Wales	Random allocation of participants to MI training and comparison condition Random allocation to conduct MI skills practice sessions with (1) a simulated patient or (2) a fellow trainee. Measurement of opinion of training after each individual session and measurement of MI competence following the completion of the training	2-Day workshops (16 h). Time between the two 2-day workshops not mentioned	1, 2, 3, 5
Lindhe Söderlund et al. [43]	10 Nurses	Weight, diet, and physical activity counselling	Child health care and school health services, Sweden	Correlation between MI training and outcome at a single point in time Interviews were conducted 6 months after the training	2-Day workshop and 4 follow-up sessions over 6 months (≥16 h)	1, 2, 3, 4, 5, 6
Sargeant et al. [42]	46 Physicians and 1 nurse	Lifestyle counselling	Primary care, Canada	Correlation between MI training and outcome at two points in time Questionnaires were answered post-training and 3 months later, interviews were conducted 3–6 months after the training	2-h workshop (given on 3 occasions over 13 months) (2 h)	1, 2, 3, 5

AMI, adaptation of MI; BA, brief alcohol intervention; BCC, behaviour change counselling; BECCI, BCC index; MI, motivational interviewing; MITI, MI treatment integrity; MISC, MI skill code.

[a] Reported on MI competence and clinical use.

[b] Reported on patient health outcomes.

[33,38]. The studies were conducted in eight countries: 3 from the United States, 1 from Canada, and 6 from Europe (2 in the Netherlands, and 1 each in Denmark, Ireland, Sweden, and Wales).

The number of health professionals in the studies ranged from 7 to 87. Physicians and nurses were the most common professional categories, although there was considerable variety. The studies were mostly set in primary care, but there were also studies that described MI training for staff in settings such as acute care, home-care organization, maternity care, and child health care and school health services. The intended or actual use of MI encompassed counselling on many different issues, including general lifestyle issues, diabetes, smoking, alcohol, medication adherence, weight, diet, and physical activity.

Three of the studies [32,33,39] were randomized controlled trials, using random allocation of study participants, usually to an MI training group and a control group who received some other form of lifestyle or health-related training that lacked MI elements. Two studies [34,39] assessed outcomes pre-training to analyse the changes produced by the training. All studies used post-training measurements, ranging from immediately after completion of the training to up to 5 years later, although most studies conducted post-measurement at 1–6 months after the training.

3.2. Study quality

The study quality varied considerably among the 10 studies. Study population and setting characteristics and recruitment of participants (i.e. health care practitioners) were sufficiently described in all the studies. Two studies neglected reporting on MI training participation rates. Not a single study reported on potential differences between the practitioners who took part in the MI training and those that did not participate or dropped out. Power analysis was reported in two studies. Reporting of *p*-values occurred in five studies. Four of the studies used one or more validated instruments to measure MI training outcomes.

Five of the 10 studies assessed MI training outcomes at a single point in time, i.e. level 1 study design according to the MSSM instrument. One of the studies investigated a temporal sequence between the MI training and the outcome (level 2). Four of the studies employed the design with the highest internal validity, i.e. random assignment of study participants to the MI training and one or more comparison conditions (level 5).

3.3. Training details

Duration of the MI training varied considerably, from a 20-min video to a 2-day workshop followed up by another day, that is, a total of 24 h (Table 2). The median length was approximately 9 h, that is, slightly more than 1 day; 9.33 h was calculated for the study by Velasquez et al. [4], which included three workshops of different lengths. Three studies investigated MI training lasting 4 h or less; four studies examined training efforts that lasted 16 h or more.

All the studies characterized the training as being MI except for studies that described training as behaviour change counselling [34] and adaptation of MI [31]. However, the training focused on MI elements and the descriptions were sufficiently detailed to warrant inclusion.

The training content included in the studies is listed in Table 2. No study reviewed here seemed to address stage 8 (switching between MI and other counselling methods).

3.4. Outcomes: participants' reaction to the training

Participants' reaction to the training was assessed in four of the studies, using questionnaires (three studies) or interview (one

Table 3
Study outcomes and key findings of the studies.

Study	Participants' reaction to the training (data source)	MI competence (data source)	Clinical use of MI (data source)	Patient health outcomes (data source)
Handmaker et al. [39]	The participants believed the MI video was clear in explaining and demonstrating the principles and skills of MI (interviews)	There were significant differences between the experimental and control groups with regard to changes in MI skill ratings following the training. The experimental group participants were rated as showing greater empathy, minimizing patient defensiveness, and supporting patients' beliefs in their ability to change (analysis of filmed counselling sessions)		
Saitz et al. [41]			Most participants (91%) reported that the training affected their practice, that they frequently or always asked new patients who drank alcohol a formal screening questionnaire (78%), that they frequently or always assessed their abusing patients' readiness to change (94%), that they were more likely to screen patients for alcohol- or drug-related problems (86%) and to ask patients about their substance abuse during a follow-up visit (96%) (questionnaire)	
Velasquez et al. [4]	The participants were enthusiastic about the training sessions, which they rated as effective in preparing them to deliver the smoking cessation interventions. They felt "at least moderately confident" in their abilities to use MI elements to deliver the smoking counselling interventions (questionnaire)		Barriers to implementation of the "full intervention" included time constraints and competing priorities. Participants reported that they often did not even have the time to deliver personalized feedback or complete decisional balance exercises. The end result was that "many of the study patients received less than the optimal or planned dose of the intervention" (questionnaire)	
Broers et al. [34]	The participants rated the different training elements with a mean of 8.2 out of a possible 10. All BCC skills were rated as relevant for motivating patients by 88% of the participants (questionnaire)		At the 4- to 10-month follow-up, 71% believed that BCC was feasible within the time frame of a normal consultation, 41% reported using BCC techniques often during their consultations, and 59% reported using them sometimes (questionnaire)	
Rubak et al. [33][a]; Rubak et al. [38][b]		The participants trained in MI adhered more to MI-consistent elements than did the control group at follow-up (questionnaire)	Those trained in MI generally had positive attitudes to MI, believing to a large extent that MI is "realistic and usable in daily work" and that MI is "more effective than traditional advice giving." More than 95% of the participants receiving the training stated that they had used the specific methods in clinical practice (questionnaire and interviews)	Patients of the MI-trained general practitioners were more motivated to change their behaviour than the patients of the control group professionals 1 year after the MI training. They also reported a better understanding of the factors that would help prevent diabetes complications and ensure relevant disease control (patient questionnaire)

Table 3 (*Continued*)

Study	Participants' reaction to the training (data source)	MI competence (data source)	Clinical use of MI (data source)	Patient health outcomes (data source)
Brug et al. [40]		MI-trained adhered better with MI criteria. They scored higher on total number of reflections made, and they were less likely to talk for most of the consultation time. At the second measurement, they showed more empathy, included more change statements, and scored higher on the MI spirit scale than controls (analysis of filmed counselling sessions, using MITI and MISC)		Patients of MI-trained dieticians had significantly lower saturated fat intake levels than patients of control dieticians at 5–6 months after the training was held. No effects on glycated hemoglobin, body mass index or waist circumference were observed (patient questionnaire)
Casey [31]			The participants found the acquired skills relevant to practice, and were confident in using them. Although some were unsure of their competence, they described instances where patients had committed to change or were contemplating change. There were also instances where the participants abandoned the use of MI, feeling that the patient was not ready. There was evidence that further training was required (interviews)	
Lane et al. [32]	Participants in the experimental group rated the applicability of the training sessions slightly higher than the controls, but the differences were not statistically significant. Both groups showed increases in their ratings for applicability of the sessions over time (questionnaire)	There was no significant difference in skill levels between the two groups or opinion the sessions. There was little indication of an association between the participants' opinion on the training and their skill levels (analysis of filmed counselling sessions, using BECCI)		
Lindhe Söderlund et al. [43]			Important barriers to nurses' MI use were their lack of recognition that overweight and obesity among children constitute an important health problem, problem ambivalence among nurses who felt that children's weight might be a problem although there was no immediate motivation to do anything, and parents who the nurses believed were unmotivated to deal with their children's weight problem. Facilitators to the nurses' MI use included their recognition of the advantages of MI in working with topics perceived as sensitive, parents who were cooperative and aware of the health problem, and working with obese children rather than those who were overweight (interviews)	

Sargeant et al. [42]	Main changes reported were: asking more questions, listening more, assessing patients' readiness to change, and tailoring counselling to patients' readiness to change. The participants seemed to have acquired and retained new knowledge and most were able to apply the new skills in their practices. Many reported feeling more comfortable and/or confident when interacting with patients, but factors such as time constraints, lack of self-efficacy, and fears of missing opportunities to influence patients moderated participants' ability to adopt and maintain the new approaches (interviews and questionnaire)

AMI, adaptation of MI; BAI, brief alcohol intervention; BCC, behaviour change counselling; BECCI, BCC index; MI, motivational interviewing; MITI, MI treatment integrity; MISC, MI skill code.
[a] Reported on MI competence and clinical use.
[b] Reported on patient health outcomes.

study) (Table 3). Although the studies examined heterogeneous outcomes, the participants' reactions were generally favourable. Broers et al. [34] reported beneficial results concerning the training participants' opinions of different training elements and perceived relevance of different MI-related skills. The participants in the study by Velasquez et al. [4] considered the training as effective in preparing them to deliver smoking cessation interventions. Lane et al. [32] noted a positive development over time concerning the perceived applicability of the training to clinical practice. The participants in the study by Handmaker et al. [39] perceived the MI video that was used in the training as clear in explaining and demonstrating the principles and skills of MI.

3.5. Outcomes: MI competence

MI competence was investigated in four studies (Table 3). Three studies relied on analysis of recorded MI sessions. The studies by Handmaker et al. [39] and Brug et al. [40] reported significant differences between experimental and control groups in the participants' ability to show empathy, use reflections, and support patients to change behaviour. Lane et al. [32] did not observe a significant difference in skill levels between participants learning MI by using a simulated patient or by training with a colleague. Rubak et al. [33] used self-report questionnaires and knowledge of skills test, and showed that participants trained in MI adhered more to MI-consistent elements than did the control group.

3.6. Outcomes: clinical use of MI

Different aspects of the clinical use of MI were investigated in seven studies (Table 3). Several of the studies reported positive findings. Saitz et al. [41] showed that training had a significant effect on practice as the participants screened and asked more patients about their substance abuse. Similarly, Sargeant et al. [42] observed that participants made specific changes in their counselling approaches and felt more comfortable interacting with patients. The participants in the study by Rubak et al. [33] considered MI usable in daily practice and more effective than traditional advice giving. Broers et al. [34] concluded that brief client counselling was feasible within the time frame of a normal consultation. The participants in the study by Casey [31] valued the MI skills acquired, found them relevant to practice, and were confident in using them. Participants in the study by Lindhe Söderlund et al. [43] felt that the use of MI with sensitive topics was an advantage over traditional advice-giving approaches.

Some of the studies reported barriers to the clinical use of MI. Velasquez et al. [4], Broers et al. [34], and Sargeant et al. [42] reported time constraints for using MI effectively; Casey [31] and Lindhe Söderlund et al. [43] noted the difficulties participants experienced with unwilling or otherwise resistant patients.

3.7. Outcomes: patient health outcomes

Two studies on diabetes counselling analysed the effects of the MI training on patient health outcomes, using patient self-report questionnaires (Table 3). Both reported favourable results. Brug et al. [40] observed that patients of the MI-trained dieticians had significantly lower saturated fat intake levels than patients of control dieticians 5–6 months after the training took place. However, no effects on glycated hemoglobin, body mass index or waist circumference were observed. Rubak et al. [38] found that, 1 year after the MI training, the patients of the MI-trained general practitioners were more motivated towards behaviour change than the patients of the control group professionals. The patients also had a better understanding of factors that would help prevent complications and ensure relevant disease control.

4. Discussion and conclusion

4.1. Discussion

This study systematically reviewed 10 studies that evaluated different aspects of MI training for use by professionals in general health care, that is, the first tier of health provision (including primary health care). Most of the studies were conducted within the last 4 years, suggesting an increased relevance for evaluation of MI training for general health care professionals as MI has become more widely disseminated into non-specialist health care settings. MI began to attract considerable interest from general health care professionals in the 1990s, after the publication of Miller and Rollnick's first book in 1991 [44] and subsequent reports of successful results in specialist settings [45]. Increasing emphasis on patient-centred practice in general health care has led many practitioners to seek new methods for communicating with patients [46]. However, this development has also caused some concern, with time restrictions in busy care contexts and the difficulty of learning MI for health professionals lacking a therapeutic background mentioned as potential barriers to the application of MI with fidelity to its principles [45,47].

The studies on MI training reviewed here covered various lifestyle topics; the most frequent topic was diabetes, followed by counselling on alcohol and smoking. The studies were heterogeneous on many aspects of the study protocol, from the number of participants to methodology. Duration of training varied considerably, with an average length slightly longer than 1 day. Three studies described MI training lasting 4 h or less.

Is it possible to learn MI principles and techniques satisfactorily in such a short space of time? This concern may be particularly relevant for health professionals who are trained in expert approaches and provision of information and advice, and may lack experience with more patient-centred, empowerment-oriented approaches to counselling such as MI. Research has shown that workshops usually produce some immediate gains in MI competence, but these gains do not always endure [17]. It has also been suggested that it is difficult to suppress prior counselling habits, including practices that are inconsistent with MI [22]. Several MI researchers have emphasized that MI must be considered as a highly complex clinical skill that takes considerable time to learn and master [26,48,49]. Rollnick et al. [49, p. 177] have warned against viewing MI as "a quick trick, a simple procedure that one could learn in a few minutes over pizza." MI seems to represent a "magic bullet" for a more humanistic, patient-centred health care [49,50], but with this promise comes the risk of naïve over-optimism about the prospects of health professionals quickly learning and mastering MI.

Most studies, but not all, involved follow-up training sessions and/or training events spread over a longer time period. The importance of using systematic post-training support or instruction has been emphasized [24,49]. Madson and Campbell [51] emphasise the use of objective observational tools for evaluating MI fidelity and quality. However, formal learning, that is, training events such as workshops or lectures structured by a teacher, is only one aspect of learning MI. The informal learning that occurs in everyday counselling in clinical practice is important for obtaining feedback on one's performance of MI. Modern learning theories emphasize the importance of situated, experiential learning and reflective practice [52]. Informal learning of MI is an under-researched issue.

The most commonly used training elements in the studies were the MI spirit, basic MI skills, recognizing and reinforcing change talk, and rolling with resistance. Thus, the MI training emphasized phase 1 of MI, which focuses on resolving the client's ambivalence and building motivation, rather than phase 2, which is aimed at strengthening the client's commitment for change and action [3]. Our findings on training content are similar to the systematic review by Madson et al. [18], which had a broader focus than our study, as it encompassed MI training for use in mental health and substance use issues in specialist settings. Hence, MI training for general health care practitioners in relation to the eight stages of MI seems to resemble training studies in other fields.

The MI training generated positive outcomes overall. The participants seemed generally satisfied with the training offered and their MI competence was evaluated favourably.

Half of the studies investigated at least two of the four outcome levels, yet no single study assessed all four levels, as advocated by Kirkpatrick [35]. Although it is possible that further levels were assessed in other papers based on the same studies, we could not find any additional articles containing data of relevance to this review. Assessment of all levels would be consistent with theory-based evaluations, which are based on the premise that evaluations should be built around the underlying assumptions (i.e. "theory") of the programme, that is, the presumed causal mechanisms of the programme [53]. Without the benefit of a clearly articulated theory about how a programme is supposed to work, one cannot ascertain whether it did work or why it did or did not yield the intended benefits. In this case, this causal chain would be that the participants' interest, attention, and motivation (reactions) facilitated their learning of MI (competence) and led to practice changes in their everyday work (clinical use), which yielded improved health status among their patients (patient health outcomes). There is a need for MI training evaluations that examine more outcome levels and link the results of the different levels to more convincingly establish the effectiveness of MI training.

MI training outcome measures were diverse. Standardized, validated instruments such as Motivational Interviewing Treatment Integrity Code (MITI) [54], the Behaviour Change Counselling Index (BECCI) [55] and the Motivational Interviewing Supervision and Training Scale (MISTS) [56] have been developed to assess MI competence of clinicians. However, there are no similar tools for measurement of participant reactions or practitioners' clinical use of MI. There might be a need to develop a consensus on how to measure reactions to MI training and the clinical use of MI. Development of MI proficiency assessment tools for use in everyday, real-life contexts has been discussed among MI researchers [9].

The methodological quality of the included studies was inconsistent. The small sample size reduces the ability to analyze various characteristics of the study population with more precision. Four of the studies employed randomization of the MI training participants to different groups, which is desirable to be able to attribute the observed outcomes to the MI course. However, the other six studies used designs that allow for numerous threats to internal validity, which makes it difficult to preclude alternative explanations for the outcomes. There were also obvious threats to external validity in some of the studies. For example, Broers et al. [34] reported that only 4% of the invited practitioners took part in the training course, which suggests that those who did participate were highly motivated to do so and thus not fully representative of the broader population of MI trainers in general health care.

Ultimately, this review cannot answer the pertinent question "what is the best way to train people in MI?," which was raised by Arkowitz and Miller [3]. The results must be interpreted with caution due to the inconsistent study quality and limited number of high-quality studies. Still, the results suggest that MI is best learned in workshops of sufficient duration, incorporating follow-up sessions or some form of post-course supervision, by applying MI in routine clinical practice with clients, and by practicing MI on one's own and with someone else (a hired coach or simply a colleague) who is more proficient in MI. Tape-recorded MI sessions and use of coding instruments for learning can be important

training tools in this learning process. However, there are many remaining challenges before we can be confident of how to best conduct and evaluate MI training.

There is an obvious need to conduct more high-quality studies that use study designs that can handle threats to internal and external validity, report with full transparency on the MI training content, and employ validated outcome instruments to the extent it is feasible to do so.

This study has shortcomings that must be considered when discussing the results. The inclusion criteria used in this study meant that we found a limited number of studies. Despite using a systematic and comprehensive search strategy, it is possible that we missed studies that should have been included, for example in the "grey" or unpublished literature, including dissertations. It may be considered a shortcoming that studies had to be published in English, but it is questionable whether there are many non-English studies that describe and evaluate MI training for general health care professions. Publication bias also has to be considered, but may be of little influence since there are so few studies. There were some differences regarding the transparency of the MI training elements. However, we were able to verify the content of most studies

4.2. Conclusion

In conclusion, we found that the MI training efforts were targeted at resolving client ambivalence and building client motivation (phase 1 of MI). Outcomes at the four levels investigated were generally favourable, demonstrating that MI can be used to improve client communication and counselling on lifestyle-related issues despite the concerns expressed about the increased use of MI in general health care settings. However, the methodological quality of the 10 studies was inconsistent and the majority of the studies employed study designs that do not sufficiently control for threats to internal validity. Furthermore, the 10 studies were heterogeneous in many respects, including study protocols and outcome measures, which make it difficult to draw unambiguous conclusions on some aspects of the training.

There is an obvious need to conduct more high-quality studies that use study designs that can handle threats to internal and external validity, report with full transparency on the MI training content, and employ validated outcome instruments to the extent it is feasible to do so.

4.3. Practice implications

The content of MI training for general health care practitioners is similar to the training provided for professionals in specialist settings. This review suggests that MI training outcomes are generally favourable, but more high-quality research is needed to help identify the best practices for training in MI.

Conflict of interest

None of the authors or their institutions have a financial or other relationship with other people or organizations that may inappropriately have influenced the research. Hence, no conflict of interest exists.

Acknowledgements

This research project was financially supported by the County Council of Östergötland, Sweden. This funding source had no involvement in the conduct of the research or the preparation of the article. We would like to thank the two anonymous referees for their valuable comments and suggestions on an earlier version of this article.

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