Original article

A systematic review of motivational interviewing in healthcare: the potential of motivational interviewing to address the lifestyle factors relevant to multimorbidity

Kylie J. McKenzie1, David Pierce2, Jane M. Gunn3

1Psychology Department, Ballarat Health Services and Department of General Practice, University of Melbourne, Melbourne, Victoria, Australia; 2Rural Health Academic Centre, University of Melbourne, Ballarat, Victoria, Australia; 3Department of General Practice, University of Melbourne, Melbourne, Victoria, Australia

Abstract

Internationally, health systems face an increasing demand for services from people living with multimorbidity. Multimorbidity is often associated with high levels of treatment burden. Targeting lifestyle factors that impact across multiple conditions may promote quality of life and better health outcomes for people with multimorbidity. Motivational interviewing (MI) has been studied as one approach to supporting lifestyle behaviour change. A systematic review was conducted to assess the effectiveness of MI in healthcare settings and to consider its relevance for multimorbidity. Twelve meta-analyses pertinent to multimorbidity lifestyle factors were identified. As an intervention, MI has been found to have a small-to-medium statistically significant effect across a wide variety of single diseases and for a range of behavioural outcomes. This review highlights the need for specific research into the application of MI to determine if the benefits of MI seen with single diseases are also present in the context of multimorbidity.

Keywords: multimorbidity, patient–provider communication, patient-centred care, motivational interviewing, systematic review

Introduction

Multimorbidity is defined as the diagnosis of more than one long-term condition in one person [1]. Epidemiological research has found high prevalence rates for multimorbidity [2–4]. This is particularly true in primary care, with studies in Scotland, Australia, and the USA identifying rates of 23.2% [2], 37.1% [3], and 45.2% [5], respectively. Compared with single diseases, multimorbidity is associated with a higher demand on health services, including more primary care contacts, prescriptions, and referrals for specialized care [6–8]. Demands on patients are also higher, due to burden of illness and treatment [9]. Lack of coordination of services [9–11], inattention to patient preference [7,11], and the prevailing single-disease focus of clinical guidelines [2,12,13] all add to treatment burden. Applying single-disease guidelines to multimorbidity is costly, increases polypharmacy, and involves prescription of unrealistic daily self-care activities [13,14]. Multimorbidity is a significant health issue and effective interventions are needed [13,15–19].

Research on multimorbidity interventions is limited [8,19,20]. A 2013 Cochrane Collaboration review identified only 10 randomized control trials; two of which
examined specific comorbidities [19]. Expert consensus recommendations emphasize supporting behaviour change to address lifestyle factors [19,21–23]. In Canada, Fortin and colleagues examined the association between lifestyle factors and multimorbidity in 1,196 subjects and found that smoking, a diet lacking fruit and vegetables, lack of physical activity, alcohol consumption, and excess weight, are all factors associated with an increased likelihood of multimorbidity [24]. Furthermore, the likelihood of multimorbidity increased with each additional unhealthy lifestyle factor [24]. Medication adherence may also be important, given its impact on chronic condition management [25,26]. The World Health Organization also promotes a greater focus on patient-centred skills, highlighting communication and support for behaviour change in chronic illness [23]. With its emphasis on the individual patient and focus on health-behaviour change, Fortin and colleagues suggest that motivational interviewing (MI) may be a useful intervention for the lifestyle factors impacting on multimorbidity [24].

MI has been formally defined as “…a collaborative, goal-oriented style of communication with particular attention to the language of change. It is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person’s own reasons for change within an atmosphere of acceptance and compassion” [27]. MI is characterized by the use of communication skills, such as open questions, reflective listening to express empathy, and emphasis on patient autonomy in a clinical session [27]. First described by Miller in 1983 [28], the original application of MI was in treatment programmes for people with addictions, and subsequent studies demonstrated good clinical outcomes [29]. More recently, MI has been seen as a potentially effective intervention in physical healthcare settings [30]. This has been accompanied by an increase in the publication of primary research [31] and systematic reviews of MI [32–37]. MI has been found to have a small-to-medium effect across settings and a range of target behaviours [33, 37–40]. Lundahl and Burke [41] reviewed the findings of four meta-analyses in 2009, and found that MI was significantly more effective than no treatment, and equivalent to other treatments for a range of behaviour-change outcomes. Given the breadth of application of MI, and its patient-centred focus, further evaluation of its potential in multimorbidity care is warranted.

This systematic review identifies research papers of MI in healthcare where authors have used systematic review methodology to identify primary intervention trials and have also conducted a meta-analysis. This is the first systematic review of the literature to specifically examine meta-analyses. This systematic review has three objectives. Firstly, we will examine the evidence for MI in healthcare and specifically for multimorbidity, including the effectiveness of MI for addressing the lifestyle factors relevant to multimorbidity. Secondly, given the widespread impact of multimorbidity on the healthcare system and the recommendation to integrate multimorbidity intervention into existing healthcare [19], we will examine whether MI can be delivered effectively by a range of healthcare providers. Finally, based on this analysis of the reviews, we will consider and discuss the potential of MI in clinical work of patients with multimorbidity.

Methods

Our systematic review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement [42,43]. Review criteria were outlined a priori.

Inclusion criteria

Articles were included if the authors used systematic review methodology to identify relevant primary interventions, and also conducted a meta-analysis of the data from the identified primary interventions. Reviews were only included if participants were recruited from healthcare services, not criminal justice, education, or other sectors. We included reviews that identified studies of MI intervention, where authors of the reviews defined MI according to the general principles outlined by Miller and Rollnick [27], and used these principles in selecting the primary intervention papers. Included reviews were those that compared MI intervention with control, treatment as usual, or other intervention with behaviour change or standardized outcome measures.

Search strategy and article selection

The search included articles published up to and including January 2014. Due to practical constraints, selection was limited to English-language articles that were peer reviewed and published in full. The following electronic databases were searched: PsychInfo, Medline, CINAHL, EMBASE, and Cochrane library. In addition, we searched the online bibliography accompanying the 2013 Miller and Rollnick textbook [44]. Search terms were ‘motivational interview*’ AND [‘systematic review’ OR ‘meta-analysis’]. Terms included both subject index terms and free text. Duplicate articles were removed using the duplicate identification function in EndnoteX5 (Thomson Reuters, New York, Version X5 for Macintosh and Windows, 2011).
The search strategy and initial screening of article titles was performed by K.J.M.; articles clearly not meeting eligibility criteria were excluded. Abstracts were reviewed to determine whether a publication met the criteria for a systematic review or meta-analysis and if MI was an intervention included in the analysis. Full-text articles were reviewed to confirm eligibility. Uncertainty about inclusion of articles was resolved through discussion with the review team at regular meetings.

**Assessment of quality of systematic reviews**

All included articles were reviewed by K.J.M. using AMSTAR (A MeaSurement Tool to Assess systematic

---

**Figure 1** Flowchart of selection process for included articles using the following electronic databases: PsycINFO (database of abstracts produced by the American Psychological Association), CINAHL (Cumulative Index of Nursing and Allied Health Literature), Medline (Medical Literature Analysis and Retrieval System Online), EMBASE (Excerpta Medica database), Cochrane Library, and the bibliography by Miller and Rollnick [44].

© 2015 The Authors
*Published by Swiss Medical Press GmbH | www.swissmedicalpress.com*  
*Journal of Comorbidity 2015;5:162–174*
The characteristics of the included systematic reviews are summarized in Table 1 [33,34,36,37,39,40,48–53].

Table 2 summarizes the chronic conditions specified for participant groups in included systematic reviews [33,34,36,37,39,40,48–53]. Participant groups included people living with a range of conditions; however, no systematic review specifically examined multimorbidity.

Table 3 summarizes the effect sizes, limitations, and conclusions for each systematic review [33,34,36,37,39,40,48–53]. Small-to-medium statistically significant effect sizes were reported for the overall effect of MI intervention across a range of health behaviours relevant to multimorbidity. Overall effect sizes ranged from $d=0.18$ [95% confidence interval (CI) 0.01, 0.37] [48] to $d=0.77$ (95% CI 0.35, 1.19) [36].

Clinicians delivering MI interventions

Summary information about clinicians delivering MI interventions for each of the 12 meta-analyses is presented in Table 4 [33,34,36,37,39,40,48–53].

Treatment fidelity and MI training

Table 5 presents a summary of the minimal information available for MI training and treatment fidelity [33,34,36,37,39,40,48–53].

Discussion

We identified 12 systematic reviews that also included meta-analysis for MI in healthcare. We did not identify

Figure 2 Rating for each of the identified systematic reviews that also included meta-analysis, using AMSTAR (A MeaSurement Tool to Assess systematic Reviews) [45].

© 2015 The Authors
Published by Swiss Medical Press GmbH | www.swissmedicalpress.com

Journal of Comorbidity 2015;5:162–174
Table 1  Summary of characteristics of the included systematic reviews.

| Reference                          | Date   | No. of publications identified in systematic review | No. of trials included in analyses | Range of years of included studies | Median year of publication of included studies | Author/s country of origin | Total no. participants (included in analyses) | Target behaviour/outcome |
|------------------------------------|--------|-----------------------------------------------------|-----------------------------------|------------------------------------|-----------------------------------------------|---------------------------|-----------------------------------------------|--------------------------|
| Armstrong et al. [51]              | 2011   | 11                                                  | 12                                | 1995–2009                          | 2007                                           | Canada                     | 2,938                                         | Weight loss               |
| Burke et al. [37]                  | 2003   | 30                                                  | 30                                | 1988–2001                          | 1998                                           | USA                        | 6,385                                         | Multiple behaviours       |
| Easthall et al. [52]               | 2013   | 26                                                  | 26                                | 1990–2012                          | 2005                                           | UK                         | 5,216                                         | Medication adherence      |
| Heckman et al. [50]                | 2010   | 31                                                  | 31                                | 1998–2009                          | 2005                                           | USA                        | 9,485                                         | Smoking cessation         |
| Hettema and Hendricks [49]         | 2010   | 31                                                  | 31                                | 1998–2009                          | 2005                                           | USA                        | 8,165                                         | Smoking cessation         |
| Hettema et al. [36]                | 2005   | 72                                                  | 72                                | 1992–2004                          | 2000                                           | USA                        | 14,267                                        | Smoking cessation         |
| Lai et al. [34]                    | 2010   | 14                                                  | 14                                | 1997–2008                          | 2005                                           | Hong Kong, UK, China       | 10,538                                        | Multiple behaviours       |
| Lundahl et al. [40]                | 2010   | 119                                                 | 132                               | 1989–2007                          | 2004                                           | USA                        | 17,173                                        | Multiple behaviours       |
| Lundahl et al. [33]                | 2013   | 48                                                  | 51                                | 1997–2011                          | 2007                                           | USA/UK                     | 9,618                                         | Multiple behaviours       |
| Rubak et al. [39]                  | 2005   | 72                                                  | 19                                | 1988–2002                          | 1998                                           | Denmark                    | Not stated                                     | Multiple behaviours       |
| VanBuskirk and Wetherell [48]      | 2014   | 12                                                  | 12                                | 2001–2011                          | 2008                                           | USA                        | 3,326                                         | Multiple behaviours       |
| Vasilaki et al. [53]               | 2006   | 15                                                  | 9: c/f No Tx                       | 1988–2003                          | 1999                                           | UK                         | 2,767                                         | Alcohol reduction         |
|                                   |        |                                                     | 9: c/f Other Tx                    |                                   |                                                |                            |                                               |                          |

c/f, compared with; Tx, treatment.

Alcohol (15), diet and exercise (4), drug use (5), HIV-risk (2), eating disorder (1), smoking (2), treatment adherence (1).

Alcohol (29), blood pressure (1), diet (2), drug use (14), eating disorder (1), HIV-risk (5), gambling (1), medication adherence (1), public health intervention (1), smoking (6), treatment adherence (4), weight (1), not specified (1).

Alcohol (3), blood pressure (2), drug use (1), health promotion (3), smoking (2), not specified (1).

Alcohol (39), breastfeeding (1), dental health (1), diabetes management (1), diet (2), drug use (23), HIV-risk (4), gambling (2), health promotion (7), medication adherence (2), physical activity (3), public health intervention (1), smoking (17), treatment adherence (10), weight (1), not specified (3).

Alcohol (6), breastfeeding (1), dental health (2), diabetes management (4), diet (3), diet and exercise (1), drug use (3), Functional independence (2), eating disorder (1), HIV-risk (2), injury prevention (2), medication adherence (3), physical activity (1), quality of life (2), safe sex (1), self-management (3), smoking (8), treatment adherence (1), weight (2).

Alcohol (3), diet and exercise (1), drug use (2), medication adherence (1), smoking (2), smoking, diet, and exercise (1), treatment adherence (1), weight (1).
Table 2  Chronic conditions specified for participant groups in included motivational interviewing (MI) trials, determined by summary information and title search.

| Reference                     | Date  | No. of MI publications included in meta-analysis | Asthma | Cancer | Cardiac condition | COPD | Diabetes | Epilepsy | GI | HIV | Hyperlipidaemia | Hypertension | MS | Osteoporosis | Pain | Psychiatric illness | Stroke | Not specified |
|-------------------------------|-------|-------------------------------------------------|--------|--------|-------------------|------|-----------|----------|-----|-----|-----------------|-------------|-----|--------------|------|---------------------|--------|---------------|
| Armstrong et al. [51]         | 2011  | 11                                              | 3      | 1      | 1                 |      |           |          |     |     |                 |             |     |              |      |                     |        | 6             |
| Burke et al. [37]             | 2003  | 30                                              | 1      | 1      | 1                 |      |           |          |     |     |                 |             |     |              |      |                     |        | 3, 24         |
| Easthall et al. [52]          | 2013  | 11                                              | 1      | 6      | 2                 | 1   | 1         |          |     |     |                 |             |     |              |      |                     |        | 0            |
| Heckman et al. [50]           | 2010  | 31                                              | 1      | 1      | 1                 |      |           |          |     |     |                 |             |     |              |      |                     |        | 2, 24        |
| Hettema et al. [49]           | 2010  | 31                                              | 1      | 1      | 2                 | 1   | 1         |          |     |     |                 |             |     |              |      |                     |        | 2, 23       |
| Hettema et al. [36]           | 2005  | 72                                              | 1      | 5      | 1                 |      |           |          |     |     |                 |             |     |              |      |                     |        | 10, 50        |
| Lai et al. [34]               | 2010  | 14                                              | 1      | 1      | 1                 |      |           |          |     |     |                 |             |     |              |      |                     |        | 11           |
| Lundahl et al. [40]           | 2010  | 119                                             | 1      | 1      | 2                 | 1   | 2         |          |     |     |                 |             |     |              |      |                     |        | 10, 100      |
| Lundahl et al. [33]           | 2013  | 48                                              | 1      | 2      | 4                 | 1   | 1         |          |     |     |                 |             |     |              |      |                     |        | 2, 2, 29     |
| Rubak et al. [39]             | 2005  | 19                                              | 4      | 2      | 1                 |      |           |          |     |     |                 |             |     |              |      |                     |        | 12           |
| VanBuskirk and Wetherell [48] | 2014  | 12                                              | 1      | 2      |                   |     |           |          |     |     |                 |             |     |              |      |                     |        | 9            |
| Vasilaki et al. [53]          | 2006  | 15                                              | 1      | 3      | 3                 | 1   | 1         | 1       |     |     |                 | 15          |     |              |      |                     |        | 2            |
| No. of unique references      |       |                                                 | 1      | 3      | 3                 | 1   | 1         | 1       | 15 | 2   | 4               | 1           |     |              |      |                     |        | 2            |

COPD, chronic obstructive pulmonary disease; GI, gastrointestinal; HIV, human immunodeficiency virus; MS, multiple sclerosis.
Table 3  Summary of effect sizes, limitations, and conclusions for included meta-analyses.

| Reference                          | Overall | Alcohol | Smoking | Diet and exercise | Medication adherence | Weight | Limitation | Conclusion                                      |
|-----------------------------------|---------|---------|---------|-------------------|----------------------|--------|------------|------------------------------------------------|
| Armstrong et al. (2011) [51]      | –       | –       | –       | –                 | –                    | –      | –          | Low statistical power. MI offers a useful adjunct intervention to current interventions. |
| Burke et al. (2003) [37]          | –       | –       | –       | –                 | –                    | –      | –          | Search limited to PsyCINFO and trainer network |
| Easthall et al. (2013) [52]       | –       | –       | –       | –                 | –                    | –      | –          | Effect sizes corrected for publication bias    |
| Heckman et al. (2010) [50]        | –       | –       | –       | –                 | –                    | –      | –          | MI efficacious but not superior to other medication adherence interventions |
| Hettema and Hendricks (2010) [49] | –       | –       | –       | –                 | –                    | –      | –          | MI efficacious for smoking cessation in adolescents and adults, but not for perinatal women |
| Hettema et al. (2005) [36]        | –       | –       | –       | –                 | –                    | –      | –          | MI has some efficacy for smoking cessation     |
| Lai et al. (2010) [34]            | –       | –       | –       | –                 | –                    | –      | –          | MI appears a useful stand-alone intervention, with additive potential to other interventions |
| Lundahl et al. (2010) [40]        | –       | –       | –       | –                 | –                    | –      | –          | MI appears moderately successful for smoking cessation |

a: includes multiple studies; b: unique studies; c: within the same trial.
| Reference | Overall | Alcohol | Smoking | Diet and exercise | Medication adherence | Weight | Limitation | Conclusion |
|-----------|---------|---------|---------|-------------------|----------------------|--------|------------|------------|
| Lundahl et al. (2013) [33] | OR=1.55* [1.4, 1.71] (k=51, WL: 7, IO: 16, SC: 28); N=9,618; 48 references; 28 unique* | – | – | – | – | – | Limited information about fidelity, difficult to ascertain comparison conditions | MI efficacious in medical settings for some target behaviours |
| Rubak et al. (2005) [39] | – | 14.64* units alcohol/week [13.73, 15.55] (k=7, TAG: 2, SC: 2, AT: 1); N=764; 3 references; 0 unique* | 1.32 cigs/day [0.25, 2.88] (k=3, TAG: 3); 3 references; 0 unique* | – | – | 0.72 BMI or kg/m² [0.33, 1.11] (k=6, TAG: 2); 6 references; 5 unique* | MI outperforms traditional advice giving |
| VanBuskirk and Wetherell (2014) [48] | d=0.18* [0.01, 0.37] (k=16, VC); N=3,326; 12 references; 7 unique* | d=0.22 [-0.21, 0.65] (k=6, includes smoking, alcohol and other drugs, VC); N=1,504; 4 references; 4 unique* | Physical activity, only, d=0.07 [0.08, 0.21] (k=3, SC: 2, AT: 1); N=794; 2 references; 1 unique* | d=0.19* [0.01, 0.37] (k=2, SC: 2); N=794; 2 references; 1 unique* | d=0.47 [-0.04, 0.99] (k=2, SC: 1, SC+I: 1); N=475; 2 references; 2 unique* | Subgroup meta-analyses lacked power due to small sample sizes. Data for smoking, alcohol and other drugs combined | Support for the application of MI in primary care settings for range of behaviours |
| Vasilaki et al. (2006) [53] | – | d=0.18 [0.07, 0.29] (k=9, NT: 9); d=0.43* [k=9, AT: 9] [0.17, 0.70]; N=2,767; 15 references; 4 unique* | – | – | – | – | Fixed-effects model used; however, significant heterogeneity | Brief MI effective for reducing excessive drinking |

Combined total no. of references cited: 191

40 46 8 17 16

[...]: 95% confidence intervals; –, no effect size provided; AC, attention control; AT, active treatment; BA, brief advice; BMI, body mass index; cigs, cigarettes; d, Cohen’s d; g, Hedges’ g; I, information; IO, information only; k, no. of included trials; L, long term follow-up; MC, minimal contact; NP, non-pregnant sample; NT, no treatment; OR, odds ratio; RR, risk ratio; S, short-term follow-up; SC, standard care; TAG, traditional advice giving; VC, various comparison conditions; WL, waiting list.

*Statistically significant.

*Number of references included in this meta-analysis.

*Number of references included in this meta-analysis and not in the other listed meta-analyses.

*Data provided for 127 trials only.

*Sample size data not provided.

*Total number of references cited across meta-analyses, including those that were not unique to any one review.
### Table 4  Summary of available data about clinician type and effect of clinician type in each systematic review.

| Reference                        | No. of studies in analysis | Clinicians (n)                                                                 | Effect of clinician type                                      |
|----------------------------------|----------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------|
| Armstrong et al. (2011) [51]     | 11                         | Nurse (2), psychologists (2), dietician (1), dietician/physical activity specialist (1), psychology students (2), counsellor (1), health promotion counsellors (1), exercise scientists (1)  | Not reported                                                 |
| Burke et al. (2003) [37]         | 30                         | Not reported                                                                  | Not reported                                                 |
| Easthall et al. (2013) [52]      | 26                         | Specialist (2), researcher (3), routine HCP (4), nurse (1), health educator (1) | No effect of clinician type (across MI and other behaviour-change techniques) |
| Easthall et al. (2013) [52]      | 11 MI studies              |                                                                               |                                                               |
| Heckman et al. (2010) [50]       | 31                         | 36% counsellors/therapists, 18% staff/interventionists, 12% nurses/midwives, 9% mixed, 6% psychologists, 6% physicians, 6% health educators and 6% trainees | No effect of clinician type                                  |
| Hettema and Hendricks (2010) [49]| 31                         | Mental health and medical providers                                           | Not reported                                                 |
| Hettema et al. (2008) [36]       | 72                         | Paraprofessionals or students (8), Master’s level counsellors (6), psychologists (6), nurses (3), physicians (2), dieticians (1), and varying levels of professionals (22) | Not reported                                                 |
| Lai et al. (2010) [34]           | 14                         | Primary care physicians (2), hospital physicians (2), nurses (4), counsellors (8), psychologists (1) | Effective when delivered by primary care physicians and by counsellors |
| Lundahl et al. (2010) [40]       | 119                        | Mental health (Bachelors): (8), mental health (Masters/PhD): (12), nurse (5), student (6) | No effect of clinician type                                  |
| Lundahl et al. (2013) [33]       | 48                         | Dietician (3), physician (2), mental health providers (13), mixed (9), nurse (6) | All provider types produced positive outcomes with statistically significant effects for mixed team and mental health providers |
| Rubak et al. (2005) [39]         | 72                         | Psychologist (42), doctor (23), HCP (including nurse, midwife, dietician) (11) | Effect obtained by 83% of physician studies, 80% of studies with psychologists and 46% of studies with other HCPs 46% |
| Vasilaki et al. (2006) [53]      | 15                         | PhD student (3), student (6), clinician (4), nurse (1), staff (1)             | Not reported                                                 |
| VanBuskirk and Wetherell (2014) [48] | 12                       | Physicians or nurse practitioners (3), Master’s level therapist (1), health educator/counsellor/research assistant (8) | Higher qualifications associated with significantly better outcomes for substance use, and overall |

HCP, healthcare providers; MI, motivational interviewing.
| Reference                        | No. of studies in analysis | MI training                                           | Studies providing MI training information (%) | Treatment fidelity | Studies providing treatment fidelity information (%) |
|---------------------------------|----------------------------|------------------------------------------------------|-----------------------------------------------|--------------------|------------------------------------------------------|
| Armstrong et al. (2011) [51]    | 11                         | Not reported                                         | n/a                                           | 7 reported a measure of fidelity                    | 64                                                   |
| Burke et al. (2003) [37]        | 30                         | Authors note most included trials did not sufficiently describe training. | n/a                                           | Not well described                                   | n/a                                                  |
| Easthall et al. (2013) [52]     | 26                         | Not reported                                         | n/a                                           | Not reported                                       | n/a                                                  |
| Heckman et al. (2010) [50]      | 31                         | 11/31 studies. Mean 52 hours (SD 72)                  | 36                                            | 17 reported a measure of fidelity                   | 55                                                   |
| Hettema and Hendricks (2010) [49] | 31                        | 16/23 studies mentioned MI training; 7 studies reported training hours. Mean 28.14 hours (SD 25.89); range: 2–75 hours | 70                                            | 11 reported post-training supervision/support      | 55                                                   |
| Hettema et al. (2005) [36]      | 72                         | 13/72 studies. Mean 9.92 hours (SD 7.35)             | 18                                            | 5 reported competency assessment 3 reported some form of monitoring | n/a                                                  |
| Lai et al. (2010) [34]          | 14                         | 11/14 studies; 2–12 hours workshop training          | 79                                            | 3 reported audio recording; 4 reported supervision; 1 reported booster training; 1 reported support meeting; 1 reported use of MISC | 71                                                   |
| Lundahl et al. (2010) [40]      | 119                        | Not reported                                         | n/a                                           | 43 reported no assessment; 22 reported qualitative assessment; 17 reported standardized assessment | 33                                                   |
| Lundahl et al. (2013) [33]      | 48                         | 24/48 studies. Mean 18 hours (range 4–40)            | 50                                            | 8 reported a measure of fidelity                    | 17                                                   |
| Rubak et al. (2005) [39]        | 19                         | Not reported                                         | n/a                                           | Not reported                                       | n/a                                                  |
| VanBuskirk and Wertherell (2010) [48] | 12                     | 5/12 studies. 8 hours to 4 weeks training             | 42                                            | 6 reported supervision                              | 50                                                   |
| Vasilaki et al. (2006) [53]     | 15                         | Not reported                                         | n/a                                           | 4 reported a measure of fidelity                    | 27                                                   |

MISC, motivational interviewing skills code; a coding system for motivational interviewing, see Moyers et al. [54]. n/a, not available.
a study specifically examining MI as an intervention for multimorbidity. It appears that MI is as effective as other treatments for each of the lifestyle factors relevant to multimorbidity, and that it can be delivered by a range of healthcare providers. The extent to which these findings apply to the setting of multimorbidity has yet to be determined.

**Strengths and limitations**

Overall, the included systematic reviews were of a good quality. Similar to other studies [55,56], some items on the AMSTAR tool were not met by any publication. Items requiring more extensive statements may be affected by publication parameters. This review has synthesized significant amounts of information, and the quality of the reviews supports the conclusions drawn.

This review is limited by the fact that included reviews evaluate the effectiveness of MI for single diseases. We have examined the evidence for the lifestyle factors relevant to multimorbidity, in the absence of specific multimorbidity studies. We are therefore inferring from the available evidence about the potential of MI for multimorbidity; in particular, its potential to address lifestyle factors impacting on the health of patients with multimorbidity.

Additionally, a potential limitation of this review is that selection was limited to English-language publications. In this case, publication bias may be ameliorated by statistical assessment of publication bias in 75% of the included systematic reviews, and searching of grey literature in 50%. There was also a lack of information about cost-effectiveness. The systematic review by Lai and colleagues identified two trials that reported information about cost, but the information was insufficient to draw any conclusions [34]. While some authors of the included systematic reviews suggested that MI may be more cost-effective than other interventions as it is a briefer intervention [40,50,53], the need for specific cost-effectiveness analyses was identified as an important consideration in future research [37,40,53].

**Relating the findings to the existing literature**

The lack of evidence for the application of MI to multimorbidity intervention is not an unexpected finding. The Cochrane Review undertaken by Smith and colleagues [19] only identified 10 randomized controlled trials of intervention for multimorbidity and none of these included MI. Despite the lack of intervention trials, expert consensus recommendations identify patient-centred care and communication skills, promoting healthy behaviours, and integrating intervention into routine healthcare as core elements for multimorbidity intervention [4,12,19,23,24]. Indeed, some of the authors of the included reviews propose implementing MI as an intervention in routine healthcare [33,36,39,40,48,52] and for the multiple behaviour-change challenges inherent in primary care practice [48].

**Implications for research and clinical practice**

MI is a well-articulated and learnable skill [57–59] and appears to be a useful intervention for a range of health-behaviour-change targets, such as diet and exercise, weight management, smoking cessation, medication adherence, and alcohol consumption. All of these behaviours are relevant to people living with multimorbidity.

Further research may benefit from a greater focus on clinician proficiency, and a greater emphasis on the effectiveness of MI when delivered by a range of clinicians. Future research also needs to include treatment fidelity measures [37] to ensure the intervention being studied is indeed MI. In addition, it may also be helpful to use treatment fidelity measures with treatment as usual or comparison conditions to evaluate the degree to which MI can be differentiated from baseline communication styles in routine healthcare delivery [60].

**Conclusion**

Multimorbidity presents significant challenges to the people who are living with multiple conditions and healthcare professionals alike. MI appears to be a helpful approach to healthcare across a range of single diseases, and for health-behaviour change. Based on the existing recommendations for multimorbidity interventions and the findings of this review, it appears that research that directly examines the application of MI for working with people with multimorbidity is warranted.

**Conflicts of interest**

K.J.M. is a member of the Motivational Interviewing Network of Trainers. There are no other conflicts of interest to declare.

**Funding**

Ballarat Health Services provided in-kind support for this research.
Potential of MI for multimorbidity
for health behaviour change in primary care settings: a systematic review. Health Psychol Rev 2015;9:205–23. View Item.
39 Rubak S, Sandbæk A, Lauritzen T, Christensen B. Motivational interviewing: a systematic review and meta-analysis. Br J Gen Pract 2005;55:305–12.
40 Lundahl BW, Kunz C, Brownell C, Tollesdon D, Burke BL. A meta-analysis of motivational interviewing: twenty-five years of empirical studies. Res Soc Work Pract 2010;20:137–60. View Item.
41 Lundahl BW, Burke BL. The effectiveness and applicability of motivational interviewing: a practice-friendly review of four meta-analyses. J Clin Psychol 2009;65:1232–45. View Item.
42 Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JPA, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. Ann Intern Med 2009;151:W65–95.
43 Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Ann Intern Med 2009;151:264–9. View Item.
44 McLouth CJ. A bibliography of motivational interviewing. Appendix B. In: Miller WR, Rollnick S, editors. Motivational interviewing: helping people change. New York: The Guilford Press; 2013. Available from: http://www.guilford.com/add/miller2/biblio.pdf [last accessed Dec 14, 2015].
45 Shea BJ, Grimshaw JM, Wells GA, Boers M, Andersson N, Hamel C, et al. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Med Res Methodol 2007;7:10. View Item.
46 Shea BJ, Hamel C, Wells GA, Bouter LM, Kristjansson E, Grimshaw J, et al. AMSTAR is a reliable and valid measurement tool to assess the methodological quality of systematic reviews. J Clin Epidemiol 2009;62:1013–20. View Item.
47 Cohen J. Statistical power analysis for the behavioral sciences. Hillsdale: Erlbaum; 1988. pp. 567.
48 Vanbuskirk KA, Wetherell JL. Motivational interviewing with primary care populations: a systematic review and meta-analysis. J Behav Med 2014;37:768–80. View Item.
49 Hettema JE, Hendricks PS. Motivational interviewing for smoking cessation: a meta-analytic review. J Consult Clin Psychol 2010;78:868–84. View Item.
50 Heckman CJ, Egleston BL, Hofmann MT. Efficacy of motivational interviewing for smoking cessation: a systematic review and meta-analysis. Tob Control 2010;19:410–6. View Item.
51 Armstrong MJ, Motterhead TA, Ronksole PE, Sigal RJ, Campbell TS, Hemmelgarn BR. Motivational interviewing to improve weight loss in overweight and/or obese patients: a systematic review and meta-analysis of randomized controlled trials. Obes Rev 2011;12:709–23. View Item.
52 Easthall C, Song F, Bhattacharya D. A meta-analysis of cognitive-based behaviour change techniques as interventions to improve medication adherence. BMJ Open 2015;3:e002749. View Item.
53 Vasilaki EI, Hosier SG, Cox WM. The efficacy of motivational interviewing as a brief intervention for excessive drinking: a meta-analytic review. Alcohol Alcoholism 2006;41:328–35. View Item.
54 Moyers T, Martin T, Catley D, Harris KJ, Ahluwalia JS. Assessing the integrity of motivational interviewing interventions: reliability of the motivational interviewing skills code. Behav Cogn Psychoth 2003;31:177–84. View Item.
55 Shea BJ, Bouter LM, Peterson J, Boers M, Andersson N, Ortiz Z, et al. External validation of a measurement tool to assess systematic reviews (AMSTAR). PLoS One 2007;2:e1350. View Item.
56 Shea B, Andersson N, Henry D. Increasing the demand for childhood vaccination in developing countries: a systematic review. BMC Int Health Hum Rights 2009;9:SS. View Item.
57 Barwick MA, Bennett LM, Johnson SN, McGowan J, Moore JE. Training health and mental health professionals in motivational interviewing: a systematic review. Child Youth Serv Rev 2012;34:1786–95. View Item.
58 de Rotten Y, Zimmermann G, Ortega D, Despland J-N. Meta-analysis of the effects of MI training on clinicians’ behavior. J Subst Abuse Treat 2013;45:155–62. View Item.
59 Moyers TB, Manuel JK, Wilson PG, Hendrickson SML, Talcott W, Durand P. A randomized trial investigating training in motivational interviewing for behavioral health providers. Behav Cogn Psychoth 2008;36:149. View Item.
60 Borelli B. The assessment, monitoring, and enhancement of treatment fidelity in public health clinical trials. J Public Health Dent 2011;71:S52–63.
Author/s:
McKenzie, KJ; Pierce, D; Gunn, JM

Title:
A systematic review of motivational interviewing in healthcare: the potential of motivational interviewing to address the lifestyle factors relevant to multimorbidity.

Date:
2015

Citation:
McKenzie, K. J., Pierce, D. & Gunn, J. M. (2015). A systematic review of motivational interviewing in healthcare: the potential of motivational interviewing to address the lifestyle factors relevant to multimorbidity. J Comorb, 5 (1), pp.162-174. https://doi.org/10.15256/joc.2015.5.55.

Persistent Link:
http://hdl.handle.net/11343/261898

File Description:
Published version

License:
CC BY