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# Group motivational interviewing in the “small changes” weight management project: A quasi-experimental trial

Trevor Simper<sup>1</sup>, Jeff Breckon<sup>2</sup>, Karen Kilner<sup>3</sup>

## ABSTRACT

**Background:** Motivational interviewing (MI) has been recommended as an effective counseling intervention for weight management with overweight and obese individuals. Nevertheless, there is a paucity of research for the use of MI in weight management groups and research in the area often lacks sufficient “treatment fidelity (TF),” failing to accurately report the consistency, style, content and competence of those delivering the intervention. The current study examined the efficacy of the small changes weight management program comparing MI in groups to treatment as usual. **Methods:** Those in the MI group intervention received 12 sessions of 2 h, which comprised 9 group and 3 one to one sessions over 12 months. The MI group was treated in MI consistent manner throughout; for example, change talk was identified, evoked, and strengthened via specific microskills such as open questions, affirmations, and reflections. In the treatment as a usual group, subjects also received 9 group and 3 one to one sessions over a 12-month period. The treatment as usual group was required to self-select a “small change” at each meeting with the facilitator. All subjects were measured at 5-time points: Baseline, 3, 6, 9, and 12 months, outcome measures included: Weight, body mass index, body fat percentage, waist to hip ratio (WHR), number of minutes of daily physical activity, fruit and vegetable consumption and feelings of well-being. A TF framework was applied to the MI groups’ intervention to ensure a consistent, reliable and reproducible approach. **Results:** After 12 months, improvements were shown for all variables measured in the MI groups; only the composite measure of physical and psychological wellbeing improved statistically in the treatment as usual groups. When comparing approaches: Significant differences were found between MI and treatment as usual in favor of the MI intervention for the mean percentage change in weight and body mass index but not for % body fat, WHR, fruit and vegetable consumption, feelings of well-being or physical activity levels. The retention rates in the MI groups were higher with 64% of subjects returning for the 12 months outcome measures versus 14% in the treatment as usual groups. **Conclusions:** This study indicates improvements to weight loss outcome measures after 12 months for an intervention implementing MI for weight management groups when compared to an existing weight management program. Future research is needed to establish the empirical basis for the use of MI for weight management groups, with the heterogeneity of dose and TF as essential features.

**KEY WORDS:** Motivational interviewing (MI), treatment fidelity, weight management

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## INTRODUCTION

The rise of obesity in the western world has been well-documented in recent decades [1,2]. Small reductions to weight have been associated with clinically important changes to individuals; such as improved blood lipid profiles and greater blood sugar control [3]. Clinical change may occur either as a result of weight lost or as a result of the lifestyle changes which are implemented during weight reduction [3]. These includes consumption of more vegetables and fruits and increased uptake of physical activity [4]. These behavioral changes have been observed to occur in interventions assessing MI (MI) for individuals [5] but this has not yet been investigated or established in the group setting [6]. The mechanisms by which

MI works are not fully understood [7], yet evidence points toward MI-inconsistent behaviors (i.e., unsolicited advice giving, question-answer and expert traps) equaling poorer outcomes and MI consistent behaviors (e.g., empathy and treating the client as the resource) equaling better outcomes for clients [8].

### Background to MI

MI includes three aspects: The spirit (or relational facet); the technical skills (or OARS); and the four processes.

### The Spirit of MI

The spirit of MI is described by Miller and Rollnick as:

“*The underlying perspective with which one practices MI*” (P14) [8].

The spirit of MI refers to four elements which are interrelated: Collaboration, acceptance, compassion and evocation [8]. Collaboration, in essence, means MI is not done to someone but rather with that person and is an essential component in MI. Miller and Rollnick suggest that MI is more akin to “dancing rather than wrestling” [8].

Acceptance is also key in the spirit of MI and stems from the work of Carl Rogers, who suggested that acknowledging the absolute worth of another individual is necessary for effective change therapy [9]. Rogers associated this with unconditional positive regard [9]. Acceptance of a client should not be confused with approval or agreement with a client. Approval or agreement is irrelevant to the role of MI in helping [8]. For example, it is possible to accept how a person is without offering a judgment on the way they are. Can we please italicise the second is and the word are in this sentence- to add emphasis and clarify meaning. Acceptance can be shown through offering accurate empathy with a client, truly showing that the client has been heard and understood [9]. In the spirit of MI and connected to acceptance is the concept of supporting clients’ autonomy. Supporting client’s autonomy can be effected by explicitly acknowledging that it is the client who will decide whether change takes place or not - rather than the professional [8].

Compassion is also essential in MI, because it is the absolute intention of the MI practitioner to focus on the best interests of the client. Without compassion MI could be seen as a cynical attempt at “convincing” people to change in a way that suits the practitioner not the client. Compassion suggests making a commitment toward the welfare and best interests of the client with whom the health professional is working [10].

Finally, in relation to evocation, it is important to understand that MI is not about motivating someone who is as yet unmotivated. MI instead seeks to evoke the motivation already lying within a client. Evocation differs greatly from and is juxtaposed with a diagnosis which is more about identifying a problem so the professional can then “fix” it. Miller and Rollnick comment that the underlying message in evoking motivation from a client is: “*You have what you need, and together we will find it*” (P.229) [8]. Essentially, the MI practitioner evokes the motivation of the client for behavior change and at the same time has a responsibility to respect the client’s autonomy in either changing or maintaining status quo [11].

### **The Technical Components of MI (OARS)**

The acronym OARS is often used to encapsulate four key microskills used in MI: Open-ended questions, affirmations, reflective listening, and summaries.

#### **Open-Ended Questions**

The use of open-ended questions helps to engender a deeper understanding of the client and can help develop greater rapport

and engagement [10]. Open questions are often employed in a conversation around change and generate a richness of topics beyond which closed (short response) questions ever can.

#### **Affirmations**

The therapist offers affirmations of the client’s strengths or qualities for example determination to succeed [8]. Miller and Rollnick discuss the “overlap” between affirmation and empathy, as affirmation represents what is positive about the client and represents their inherent self-worth [8].

#### **Reflective Listening/Reflections**

Also known as empathic listening, reflective listening is akin to hypothesis testing [7]. When a client speaks they wish to convey meaning, reflections test to see if the practitioner has understood that meaning. Reflective responses can be sub-divided into simple and complex reflections. A reflection may either reflect back the words or meaning a client has used (simple) or extend and interpret meaning from the client’s statement using paraphrases and interpretation (complex).

#### **Summaries**

Summaries form a useful element of the patient-practitioner conversation about change as they serve to present several key pieces of information back to a client. Summaries can be multifaceted; they clarify content covered, allow for correction from the client, ensure engagement of the practitioner and provide a “base camp” for subsequent conversations [11].

### **The Four Processes of MI**

Recently Miller and Rollnick [8] have described the four processes of MI which are: Engaging, focusing, evoking, and planning. The processes provide a clear structure and framework for sessions within which practitioners adapt their use of MI depending on the readiness, motivation, and level of “sustain talk” or “change talk” emerging from the client [11]. First, engaging is pivotal for developing an empathic and congruent therapeutic relationship. While it appears first, it underpins the work of MI throughout the relationship at all phases. Second, focusing is the process by which the practitioner develops, and maintains, a specific direction in the conversation about the client’s change behavior. Third, evoking involves eliciting the client’s own motivations for change using the MI spirit and technical skills. It is important in MI to capture the client’s own motivation and evoke from them their desire, potential, willingness, and motivation for change rather than imposing the practitioners own attitudes and values. Fourth, planning encompasses both developing client commitment to change and formulating a concrete plan of action. The “direction” component of MI is essential in this process in order that we move toward a change goal [10].

### **MI and Self-determination Theory (SDT)**

MI has been described as a phenomenological counseling approach lacking theoretical underpinning [12]. SDT [12]

posits that it is the intrinsic motivation of an individual that is strongest in terms of change - which resonates with the MI therapists attempt to uncover and strengthen the intrinsic motivation of an individual. As a result, in recent years MI has been consistently linked to SDT [13] and it has been suggested by Markland *et al.* [14] that SDT is an appropriate theoretical framework for MI to be delivered as an intervention. In the present study, SDT underpinned the design and delivery of the intervention and in the groups; clients' autonomy and relatedness were intentionally promoted.

## METHODS

Ethical approval was obtained from Sheffield Hallam University Ethics Committee.

### Design

This trial was run as a quasi-experimental design; during year one the TAU groups ran and had the same "dose" of treatment as the MI groups which ran during year 2.

The quasi-experimental design for this program, which essentially compares what was considered "best-practice" with a new approach; is arguably the best design for this type of experimentation. RCT's are criticized in the context of an intervention which seeks to compare what was done previously or "best-effort" with a new intervention. Randomizing participants to a control group in this way, for the current research may have been inappropriate [15]. As this work compares what was done with a new approach; and therefore, the quasi-experimental design avoids "contamination of control participants" [16]. Essentially, creating a relatively weak comparator group or minimal intervention group would not answer the question: Does the approach of MI make a difference to the "usual" outcomes? Therefore, it is important to note in the current investigation what was delivered on each occasion by the same facilitator was considered best-effort.

All of the 9 groups' sessions had topics, whereas the 3 one to one interviews (sessions 1, 6 and 12) did not, as the agenda was decided by the client). In the MI group, people were always invited to decide for themselves whether the topic of conversation was what they wanted to cover e.g.: *"I have various exercises and plans we can use for our session around physical activity but you may have particular things you want to talk about?"* When group members chose one of the topics on offer their autonomy was supported (essentially: *"You are in charge of what we do here- I can make suggestions and tell you about exercises and actions others have found useful if you wish."*)

### MI Therapist Training (Treatment Fidelity [TF])

The principal investigator (PI) delivered the MI intervention and was trained in both client centered counseling and MI over a number of years. Practice recordings were coded and supervision provided, during 2010 and 2011 before the intervention began. The starting point in terms of coding for this 1 year project was

"beginning proficiency" moving to competency at 6 months which was maintained at 1 year. Practice was carried out between workshops and some supervision provided from an experienced MI practitioner and member of the MI Network of Trainers (MINT). Recordings were independently assessed via the MITI 3.1 [17] coding instrument. After this initial year, a "test" recording session (to account for "drift") was carried out with a client seeking help with their weight this was recorded and again submitted to an MI coder (using MITI 3.1). This training was followed by a further training workshop on MI in groups. Finally, PI delivered 12 introductory workshops as a co-trainer with an experienced skilled practitioner (and member of MINT), and extensive reading was carried out to support learning.

### The MI Group Intervention

The MI treatment in the present investigation involved  $9 \times 2$  h group sessions and  $3 \times 1$  h 1-1 sessions which were interspersed at the beginning, middle (6 months) and end (12 months) of the program. All 1-1 sessions were recorded and 3 recordings from these sessions were randomly selected and submitted for coding by independent MI coders. The 9 groups' MI sessions and the 1-1 sessions all involved the four key processes of MI: Engaging, focusing, eliciting and planning. A key example of the differences between the individual and group counseling approach is forming "meta-reflections" whereby reflective statements often involved a number of group members rather than just a single person. As questions are often met with different responses by several group members, the question can be followed up with: *"I wonder what others think to this?"* which helps maintain group involvement and cohesion rather than conversations devolving into one to one discussions. In the sessions, numerous behaviors were performed by the sole facilitator, these are itemized in the taxonomy, adapted from Michie *et al.* [18]. The taxonomy was designed to help facilitators working with clients seeking to change dietary and physical activity behaviors.

### Key to Taxonomy of Behaviors used Throughout the MI Program

Furthermore, added (points 1-6) are specific behaviors from MI that were not part of the original taxonomy.

1. Use of 1-10 scales to open discussion around importance confidence and promote "change talk"
2. Open questions
3. A affirmations
4. R reflections simple and complex
5. S summaries
6. E-P-E elicit, provide elicit- Provide information (with permission or on request only)
7. Goal setting (behavior), e.g., walking this week
8. Goal setting (general, e.g., an overall goal that will be achieved via long term maintenance and numerous "small changes") not a behavior as such but the goal of "reducing my blood pressure"
9. Action Planning detailed planning where, when, how, how much and who with - if relevant

10. Barrier identification/solution planning
11. Review of previous goal(s)
12. Self-monitoring
13. Focus on previous success (look back)
14. Model/demonstrate behavior
15. Prompts/cues/triggers
16. Facilitate social comparison
17. Relapse prevention
18. Stimulate anticipation of future reward (look forward).

**Participants**

About 155 participants were recruited in two cohorts (78 and 77 people respectively - one cohort ran from 2011 to 2012 and the second cohort from 2012 to 2013 - the first of these was the TAU and the second the MI group). Sampling was carried out via Sheffield Hallam University internal email system. An email invitation was distributed to all staff members from a single faculty ( $n = 1,066$ ). Participants were invited on a first come first served basis with the intention of recruiting roughly 70 participants for each arm of the trial (a Figure 1 derived by considering the maximum number of participants that time and resources would allow). The email invited participants who were looking for support in managing their weight to enroll in the study. In order to be eligible for the study subjects needed to have a body mass index (BMI)  $<29.9 \text{ kg/m}^2$  and not more

than  $40.0 \text{ kg/m}^2$ ; this level of BMI is consistent with the World Health Organization’s definition of obese [19].

**Treatment as Usual**

The treatment as usual for this study was developed over a number of years of seeing people in groups for the “small changes” project [20] these groups are psychoeducational. People are treated with an approach that contains elements of client centered counseling and elements of education. For example typically reflections are used to clarify understanding of group members statements. Alongside this, two other key features are prominent: First, topics are specifically chosen for each session and secondly each week participants are encouraged to select a “small change” for that week. Essentially the facilitator choosing the topic for discussion and the necessity of making a small change are both antithetical to MI; as the topics are selected by group leaders rather than the clients and making a change (in an MI consultation) is an autonomous process i.e., never a necessity of a given session, i.e. the client may choose to not make a change in the course of a conversation. Besides these features the length of the sessions, the location and amount of contact between facilitator and clients were the same for each approach.

**Outcome Measures**

Quantitative data was gathered via several questionnaires, and anthropometrical data was recorded in the laboratory at the University Food and Nutrition Department. The following constructs were assessed: Body mass index, waist to hip ratio (WHR), body composition, physical and psychological well-being, self-reported number of minutes of daily physical activity and number of portions of daily vegetable and fruit intake.

**BMI Height and Weight**

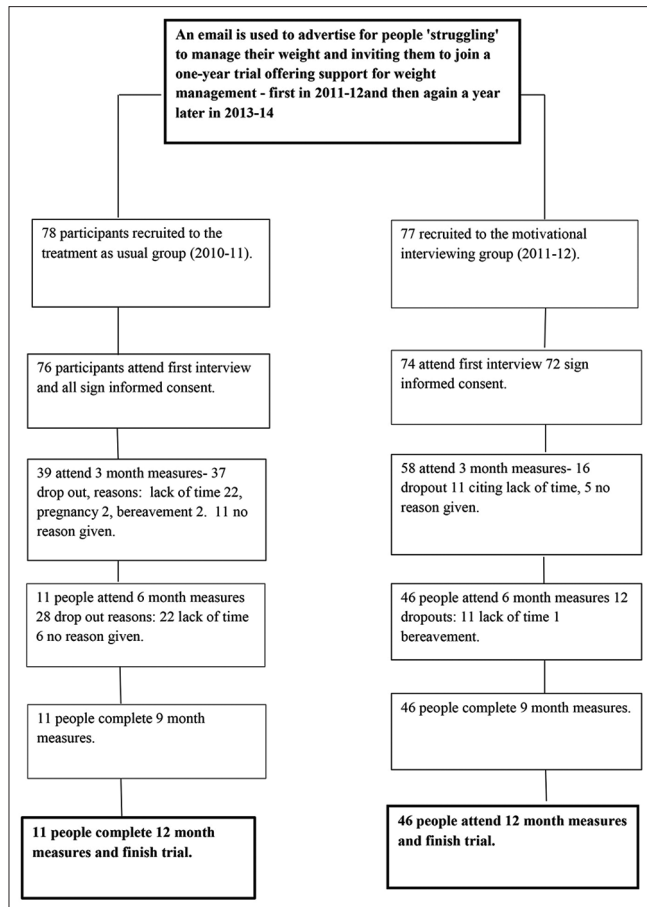
Height (in meters and centimeters rounded to the nearest centimeter) and weight (kilograms and grams rounded to the nearest 100 g) were recorded using an SECA 709 mechanical column scale with SECA 220 telescopic measuring rod (SECA Hamburg Germany). Height (without shoes) and weight (indoor clothing) were recorded to the nearest 1 cm and 0.1 kg, respectively. BMI was calculated and rounded to the nearest  $0.1 \text{ kg/m}^2$ .

**WHR**

WHR was measured using a flexible tape measure and by taking a measure one inch above the umbilicus and at the widest part of the hips. The waist measurement (cm) was divided by the hip measurement (cm).

**Body Composition**

Bio-electrical impedance analysis (BIA, spectroscopy) was used to detect changes to body composition. The tests were carried out using a using the hand-held body-stat 1500 unit



**Figure 1:** Consort diagram



(Bodystat Ltd, Isle of Man). A correlation of 0.83 has been found [21] between bio-electrical impedance and the gold standard hydrostatic weighing. Favorable comparison has also been made between BIA and dual-energy X-ray absorptiometry (DEXA) with results showing a high correlation between the two:  $r = 0.90, P < 0.05$  [22] and a correspondingly high correlation in a DEXA/BIA study comparison in overweight women:  $r = 0.90, P = 0.001$  [23].

### Short-form 36 (SF-36)

The SF-36 is a general rather than specific tool for assessing both functional health and well-being. The SF-36 is considered the most extensively validated and widely used health survey instrument for appraising the quality of life [24]. It has been deemed useful for identifying the effects of a number of health interventions [25]. The development of the SF-36 is charted by over 20 years of publications and has been applied in more than 4000 research publications between 1988 and 2000. The SF-36 has been used in studies that involved weight management and posits that the physical and psychological domains within the questionnaire interlink to present an aggregate score of general well-being and health [24]. An aggregate score is formed from the 36 item questionnaire. Higher aggregate scores equal better health.

### The Scottish Physical Activity Questionnaire (SPAQ)

The SPAQ is a 7 days recall questionnaire which has been validated against the doubly labeled water technique and according to the National Obesity Observatory is acceptable for estimating daily energy expenditure [26]. An obvious critique of the SPAQ is the necessity to recall activity, although as suggested above the SPAQ has been well developed and validated [27,28].

### Food Frequency Questionnaire (FFQ)

FFQ have been used and validated for collecting data on fruit and vegetable consumption, [29]. Cade *et al.* [30] worked on the development and validation of an FFQ for use in public health nutrition. The relationship between fruit and vegetable intake and obesity has also been suggested [31,32]. Furthermore, FFQs have been defended as essentially accurate in the assessment of a number of portions of fruit and vegetables consumed [33,34].

### Data Analysis

Data analysis was performed by SPSS 22. Summary statistics (mean, standard deviation) were recorded for each outcome at each time-point, separately for each group. Only data based on complete cases is considered in this report. Percentage changes between baseline and 12 months were calculated for each of the 7 outcome measures and tested for significance using single sample *t*-tests within each intervention group. Differences in outcomes between the MI and TAU groups were assessed using general linear models to take into account baseline levels of the measures, as well as height, sex and age where significant.

## RESULTS AND DISCUSSION

148 participants gave informed consent to participate in the trial (76 in the TAU group and 72 in the MI group). 11 (14%) and 46 (64%) respectively provided complete data up to 12 months. “Completers” in the 2 groups were comparable in terms of demographic characteristics [Table 3] and all baseline measures of interest [Table 4] except physical activity, where a considerably higher initial mean and standard deviation were apparent in the TAU group.

Within the MI group, all 7 outcome measures demonstrated statistically significant mean percentage changes over 12 months, however these were small (for example 4% in terms of the weight loss measures). Within the TAU group, only WHR and SF-36 exhibited statistically significant mean percentage change over the same time period. Observed mean percentage weight loss was lower than in the MI group, and WHR was higher (i.e., poorer). In other measures, mean percentage change was comparable between the two groups; lack of significant difference in the TAU group may be due to the small final sample size.

When comparing the intervention groups, adjusting for baseline measures, sex, age and height [Table 5], statistically significant differences in favor of MI were observed in mean percentage weight decrease (2.7 [95% confidence interval [CI] 0.18-5.3] percentage points) and mean percentage BMI decrease (2.9 [95% CI 0.3-5.5] percentage points). Other differences were not significant at 12 months. The apparently contradictory results regarding WHR in the unadjusted and adjusted analyses may be accounted for by the adjustment for both baselines WHR and sex.

The reasons for dropout were recorded where possible for both groups and were reported in the consort diagram. We have no further explanation as to the disparity in dropout between TAU and MI groups. Rates of recidivism clearly show favor to the MI

**Table 1: Overview of MI competency measured by MITI version 3.1**

Time	Global rating	Rating
Baseline	3.6	Beginning proficiency
6 months	4.0	Proficient
12 months	4.6	Proficient

MINT: Motivational interviewing network of trainers, MI: Motivational interviewing, Table 1 gives the “global rating” an overall score for MI competency (for the facilitator in the present study) and interprets the scores at baseline, 6 and 12 months

**Table 2: Baseline participant characteristics**

Variables	MI group	%/SD	TAU group	%/SD	Combined	%/SD
Height (m)	1.67	0.10	1.66	0.12	1.67	0.10
Age (years)	49.39	12.48	43.36	11.53	48.23	12.44
Male	14	30.4	4	36.4	18	31.6
Female	32	69.6	7	63.6	39	68.4
Total	46	100	11	100	57	100

Table 2 gives the baseline characteristics for both groups and combined for comparison, SD: Standard deviation, MI: Motivational interviewing

**Table 3: Outcome measures**

Variables	MI	SD (95% CI)	TAU	SD (95% CI)	Total	SD (95% CI)
Weight (kg) at baseline	95.6	15.1	92.0	19.8	94.9	16.0
Weight (kg) at 12 months	91.8	13.9	90.8	18.3	91.6	14.7
% weight decrease	3.9	(2.8, 5.0)	0.9	(-2.1, 4.0)	3.3	(2.2, 4.4)
% body fat at baseline	40.4	7.6	41.3	10.5	40.6	8.1
% body fat at 12 months	38.7	7.0	40.1	11.1	38.9	7.8
% decrease in % body fat	3.6	(0.8, 6.4)	3.6	(-0.3, 7.5)	3.6	(1.3, 6.0)
BMI (kg/m <sup>2</sup> ) at baseline	34.20	3.92	33.43	6.30	34.1	4.4
BMI (kg/m <sup>2</sup> ) at 12 months	32.87	3.95	32.97	5.68	32.9	4.3
% decrease in BMI	3.9	(2.8, 5.0)	1.0	(-2.0, 4.0)	3.3	(2.3, 4.4)
WHR at baseline	0.90	0.06	0.98	0.08	0.9	0.1
WHR at 12 months	0.87	0.06	0.91	0.06	0.9	0.1
% decrease in WHR	3.4	(2.1, 4.7)	6.4	(1.4, 11.4)	4.0	(2.6, 5.4)
SF-36 score at baseline	125	8.1	125	7.9	125.3	8.0
SF-36 score at 12 months	136	8.4	136	9.4	135.9	8.4
% increase in SF-36 score	8.7	(6.5, 10.9)	8.5	(5.7, 11.3)	8.6	(6.8, 10.5)
Fruit and vegetable (80 g portions/day) at baseline	3.6	1.5	3.8	2.0	3.7	1.6
Fruit and vegetable (80 g portions/day) at 12 months	4.6	2.0	4.4	1.5	4.5	1.9
% increase in fruit and vegetable consumption	41.4	(16.5, 66.2)	45.7	(-6.1, 97.5)	42.2	(20.5, 63.9)

WHR: Waist to hip ratio, SF-36: Short-form 36, BMI: Body mass index, MI: Motivational interviewing, CI: Confidence interval, SD: Standard deviation

**Table 4: Estimated differences in mean outcomes**

Variables	Estimated difference in favor of MI	95% CI	P value
Mean % weight decrease <sup>a</sup>	2.7	(0.18, 5.3)	0.037
Mean % decrease in % body fat <sup>b</sup>	1.7	(-2.4, 5.9)	0.401
Mean % decrease in BMI	2.9	(0.3, 5.5)	0.032
Mean % decrease in WHR <sup>b</sup>	1.6	(-1.5, 4.7)	0.300
Mean % increase in SF-36 score <sup>a</sup>	0.2	(-4.0, 4.3)	0.937
Mean % increase in fruit and veg consumption <sup>a</sup>	-8.2	(-56.3, 40.0)	0.735
Mean % increase in physical activity <sup>c</sup>	-4.6		0.233

Table 4 shows estimated differences in mean outcomes (percentage points) between intervention groups, adjusted for other significant covariates in general linear models. <sup>a</sup>adjusted for baseline, <sup>b</sup>adjusted for baseline and sex, <sup>c</sup>unsuitable for parametric analysis - P value from Wilcoxon test, BMI: Body mass index, WHR: Waist to hip ratio, SF-36: Short-form 36, MI: Motivational interviewing, CI: Confidence interval

groups and although it is not uncommon in unblinded studies for retention to be higher in an active treatment group, in this study both groups are essentially “active” treatment. TF to MI was observed in the MI group and this could be an important factor in the greater retention of subjects in the MI treatment group but needs further investigation. The TF is corroborated by the MITI codings/scores shown in Table 2.

The key conclusion here is that the addition of MI to the small changes program produced modest improvements in 2 of the 4 weight loss indices, (weight and BMI) although improvements in the other indices could be denied or demonstrated in larger trials.

**Comparison with Other Programs**

Other work combining a behavioral approach to weight management show similar results in terms of weight loss achieved [35] at 1 year; however none of these programs

specifically used group MI. It is also often difficult to tell if TF was conducted in behavioral change weight management studies. Often researchers describe an approach as, for examples: Cognitive behavioral therapy or MI, but then do not provide data showing how the specific intended approach was adhered to. This failing in behavioral research needs attending to in future studies [36]. And when TF is measured, key recommendations in relation to good practice and consistency should be observed [37,38].

**Implications for Future Research**

This study is the first to explore the efficacy of MI weight management groups using an assessment of interventionist fidelity. Nevertheless, the study needs replicating with larger numbers across a range of populations. Researchers are interested in both “enactment” or the carrying out of behavior subsequent to MI therapy and “reception” by the client. Enactment is covered in this small study, i.e., there is a follow-up of the client’s enactment of behavioral change; reception needs further consideration. Clients’ perceptions of MI have previously been measured [39] using the: Client evaluation of MI scale which gives an indication of how the therapy was received by the client; this could helpfully be adapted for group MI research. Future work should ensure TF using a valid framework as has been previously suggested [36] this would ensure internal validity and replicability.

**Implications for Future Practice**

In practice, the development of MI in groups needs further consideration as the differences in 1-1 delivery and group practice, e.g., meta-reflection (reflecting to a group rather than individually) are considerable and suggests a need for specific training for those undertaking group work. While MI has been found to be effective across a range of clinical settings, high quality and clearly reported content, frequency and duration in group settings is still scarce [36].

## Implications for Practitioner Training

Group MI training is in its infancy and the emergence of MI groups appears to be increasing [6] therefore the development of the assessing MI in groups observation tool (AMIGOS) [40] is timely and shows promise for future interventions being able to assess TF in groups. In the present investigation, all TF was measured via the 1-1 coded sessions, with supplementary observations carried out for the groups. Those carrying out research in MI groups should ensure that ongoing reflection, coding and supervision are fundamental components of interventions [37,38].

## Implications for Weight Loss Services Commissioning

Future commissioning of MI should partly be predicated upon the assessment of TF; otherwise researchers are unable to determine which active ingredients were used in interventions; or how “pure” the MI delivery has been. The use of TF is several-fold: It identifies whether an intervention can be corroborated as MI, it improves practitioners understanding of the quality of their own clinical interactions, it ensures better assessment of quality in service provision and it will help in avoiding a skewed evidence base; which currently includes many studies where TF has not been assessed [8].

## CONCLUSIONS

Weight and BMI are significantly lower in groups receiving the same dose of treatment as treatment as usual groups but with the addition of verifiable MI. The dropout rates in the treatment as usual group suggest much greater retention of subjects with MI.

The overall conclusion is one that favors the use of MI in treating people in weight management groups over a program such as “small changes” - which is arguably representative of many such weight management programs. Key features of the Small Changes program are the use of groups which were essentially educational with some person-centered counseling skills employed in the approach versus the employment of verifiable MI. There are also conclusions, considered above, for research, professional practice, training and future commissioning of services. Further work including larger trials using MI groups with a verified group-coding tool to assess TF are warranted.

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