Dietary intake and physical activity behaviour change for weight gain prevention in mid-age Australian women

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A thesis submitted for the degree of PhD (Nutrition and Dietetics)

January 2014
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Jenna Hollis
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Conflict of interest statement

Jenna Hollis reports no conflict of interest.
Publications and presentations arising from this thesis

Manuscripts in peer-reviewed journals: Published


Manuscripts in peer reviewed journals: Accepted


Manuscripts in peer-reviewed journals: Under review


Conference abstracts: Published in conference proceedings or peer-reviewed journals


### Glossary of common abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ALSWH</td>
<td>Australian Longitudinal Study on Women’s Health</td>
</tr>
<tr>
<td>APD</td>
<td>Accredited Practicing Dietitian</td>
</tr>
<tr>
<td>BIA</td>
<td>Bioelectrical impedance analysis</td>
</tr>
<tr>
<td>BMI</td>
<td>Body Mass Index</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence interval</td>
</tr>
<tr>
<td>cm</td>
<td>Centimetre</td>
</tr>
<tr>
<td>CVD</td>
<td>Cardiovascular Disease</td>
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<tr>
<td>IPAQ</td>
<td>International Physical Activity Questionnaire</td>
</tr>
<tr>
<td>ITT</td>
<td>Intention to treat</td>
</tr>
<tr>
<td>JBI</td>
<td>Joanna Briggs Institute</td>
</tr>
<tr>
<td>Kg</td>
<td>Kilogram</td>
</tr>
<tr>
<td>LOCF</td>
<td>Last observation carried forward</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>MI</td>
<td>Motivational Interviewing</td>
</tr>
<tr>
<td>MISC</td>
<td>Motivational Interviewing Screening Code</td>
</tr>
<tr>
<td>MITI</td>
<td>Motivational Interviewing Treatment Integrity</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomised Controlled Trial</td>
</tr>
<tr>
<td>SD</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>SDI</td>
<td>Self-Directed Intervention</td>
</tr>
<tr>
<td>SF-36</td>
<td>Short Form - 36</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>SWAN</td>
<td>Study of Women’s Health Across a Nation</td>
</tr>
<tr>
<td>TFEQ</td>
<td>Three Factor Eating Questionnaire</td>
</tr>
<tr>
<td>WHLP</td>
<td>Women’s Healthy Lifestyle Project</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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Abstract

The rising prevalence of overweight and obesity, the health and financial consequences associated with weight gain, and the modest and often unsustainable weight loss from obesity treatment interventions mean that it is now considered more effective to prevent obesity in healthy weight and overweight populations. Mid-age women (45-54 years) are at high risk of weight gain and studies indicate women will likely continue to gain weight and increase their waist circumference post menopause unless effective weight gain prevention initiatives are implemented. Despite this, there is limited evidence for weight control interventions in women about to undergo the menopause transition, with only one published study. The primary purpose of this thesis was to determine the effectiveness of a 12-month health professional Motivational Interviewing (MI) intervention aiming to improve dietary intake and physical activity behaviours for weight gain prevention in non-obese, mid-age women. This thesis explored the use of MI, a client-centred, guiding counselling style, for dietary and physical activity behaviour change. Three research studies were undertaken to meet these aims.

The first study was a systematic review of evidence for diet and physical activity behaviour change in response to MI interventions in comparison to an attention control. Two of the five articles reporting on dietary behaviour change found a significant positive effect on fat and percent energy from fat favouring MI. None of the six articles reporting on physical activity found any difference between MI and an attention control. Due to the limited number of studies and the poor methodological quality of the included studies, there is not yet sufficient evidence to conclude that MI enhances diet and physical activity behaviour change above an attention control, although the results from two studies suggest a positive effect. More high quality studies that objectively measure diet and physical activity, evaluate and report MI fidelity and compare the MI intervention to an attention control are required.

The second and major study was the ‘40 Something’ parallel-group Randomised Controlled Trial (RCT) which tested the effectiveness of a 12 month MI health professional intervention (MI; n=28) for weight gain prevention in non-obese, mid-age women in comparison to a self-directed intervention (SDI; n=26) that received tailored written materials. The study followed participants for an additional 12 months to assess effect maintenance. At 12 months, the MI group weighed 65.6 kg (95% CI 64.5, 66.8)
which was significantly different ($p=0.034$) from the SDI group who weighed 67.4 kg (95% CI 66.2, 68.6). When stratified by baseline BMI category, the MI group lost significantly more weight (-2.6kg, 95% CI -3.9, -1.2) than the SDI group (-0.1 kg 95% CI -1.2, 1.0 $p=0.002$) for the healthy weight women. The overweight women lost weight regardless of whether they were allocated to the MI (-3.5kg, 95% CI -6.1, -1.0) or SDI group (SDI=-2.3, 95% CI -4.1, -0.5) with no between group difference ($p=0.467$). At 12 months, the MI group had diets significantly more nutrient dense for iron ($p=0.01$) and potassium ($p=0.04$), and consumed more fruit servings ($p=0.02$) than the SDI women. Women who achieved their weight control goals consumed significantly more fruit servings (+0.76 serves/day, $p=0.02$) and less meat/meat alternatives (-0.34 serves/day, $p<0.01$) than women who did not achieve weight control. There were no significant group by time effects found for physical activity. In a mediation analysis assessing whether compliance to 10 weight control recommendations mediated weight loss, step count compliance was found to significantly mediate the 12 and 24 month effect on weight (12 months $AB=-0.74$, 95%CI=-1.95, -0.14; 24 months $AB=-1.06$, 95%CI=-2.56, -0.36). Compliance to the vegetable serving recommendation was also found to significantly mediate the effect on weight at 24 months ($AB=-0.54$, 95%CI=-1.50, -0.04).

A challenge of employing any counselling style in dietetic practice is ensuring that the professional standards are upheld whilst also employing the most effective counselling method. The final study was an examination of United States, Canadian, European and Australian dietetic scope of practice statements, competency standards and evidenced-based weight management guidelines for congruency with MI principles and strategies. Two of the four MI concepts, partnership and compassion, were consistent with scope of practice statements and competency standards. Reference to acceptance was evident in European and Canadian standards, whereas evoking intrinsic motivation was absent from all standards. The majority of MI strategies were supported by international evidenced-based guidelines.

The findings presented in this research thesis provide evidence of the effectiveness of a health professional consultation intervention for weight gain prevention and improving diet quality in mid-age women soon to experience menopause. Encouraging women to take 10,000 steps and eat five vegetable servings per day may be a promising strategy to achieve long-term weight control at mid-life. While there is substantial evidence showing the effectiveness of MI on a variety of health outcomes, more high quality
studies that examine the effect of MI on diet and physical activity behaviour change are needed. The study also found that training in MI is compatible with international dietetic practice standards and could be a valuable asset to dietetic research and practice. The results of the thesis have implications for mid-age women, the dietetic profession and behavioural researchers, and provide both clinical practice and research recommendations for weight gain prevention and motivational interviewing.