Management of excess weight in Australian general practice patients: Informing practice

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Statement of originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University of Newcastle Library*, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

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Acknowledgement of authorship

I hereby certify that this thesis is in the form of a series of published papers of which I am a joint author. I have included as part of the thesis a written statement from each co-author, endorsed by the Faculty Assistant Dean, Research Training, attesting to my contribution to the joint publications.
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SYNOPSIS

Overweight and obesity are highly prevalent conditions that impose a substantial burden on the individual and the society. As the gateway to the health care system, general practice is a promising setting to deliver interventions targeting overweight and obesity. While there has been increasing discussion regarding the role of general practitioners (GPs) in weight management, only a small proportion of overweight and obese patients are offered assistance with managing their weight. The 5As framework (Ask, Assess, Advise, Assist and Arrange) is recommended for the detection and management of lifestyle risk factors in primary care. This framework provides a structure for identifying gaps in the current literature in relation to weight management. The body of research described in this thesis is designed to provide key data in each of the 5As in the framework, to contribute to improving the provision of weight-management care in the Australian general practice setting.

The contents of this thesis by publication include an introduction, five data-based manuscripts, a systematic review and a general discussion. At the time of thesis submission, three papers have been accepted for publication in peer-reviewed journals, and the remaining three are under editorial review. These papers examine the measurement and assessment of overweight and obesity and their associated risk factors (Papers One to Three), the effectiveness of lifestyle weight-loss interventions involving GPs (Paper Five), and overweight and obese patients’ current practices and preferences for help with losing weight (Papers Four and Six). The empirical data reported in Papers One to Four, as well as Paper Six, are obtained from the “General Practice Study”, a large, multi-state, cross-sectional study examining the feasibility of implementing computerised health assessments amongst patients presenting to general practices.
The **Introduction** section provides an overview of the burden of overweight and obesity, the well-documented benefits of weight loss, and the types of treatment for overweight and obese individuals. It provides a rationale for focusing on lifestyle interventions targeting excess weight in the general practice setting, and gives a brief description of the Australian primary health care system. An overview of the 5As framework recommended for lifestyle risk factor management in general practice is presented. Gaps in research in relation to weight management in the Australian general practice setting are described using each of the 5As in the framework. The limitations identified included (i) a lack of current data regarding Australian GPs’ identification of overweight and obesity, (ii) few attempts to assess the clustering of cardiovascular-disease-related risk factors, including overweight and obesity, in general practice patients, (iii) little comprehensive evidence regarding the effectiveness of weight-loss interventions involving general practitioners, and (iv) limited information regarding patients’ preferences for weight management. Furthermore, a number of the relevant Australian studies were conducted in few sites and had small sample sizes, limiting the overall generalisability of study findings.

**Paper One (Published, BMC Medical Research Methodology): Agreement between self-reported and measured weight and height collected in general practice patients: a prospective study**

Self-reported weight and height are frequently used to assess overweight and obesity. While less invasive and relatively easy to obtain compared with objective measurements, this method is subject to limitations such as recall and social desirability bias. Agreement between measured and self-reported weight and height in Australian general practice patients has yet to be assessed. Thus, in order for self-reported measures to be used in the program of research reported in this thesis, **Paper One** examined the reliability and agreement between self-reported and measured weight and height in 332 Australian general practice patients. This paper also reported on a sub-study which tested whether informing general practice patients that their
weight and height would be measured prior to obtaining self-reported values improved accuracy of self-report, using a randomised controlled trial design. No differences in accuracy of self-reported weight and height were identified between patients who were informed and uninformed. High agreement between self-reported and measured values were identified (intraclass correlation coefficients of >0.9 for weight and height, and body mass index (BMI)). A substantial kappa value (0.70) was obtained when comparing self-reported and measured weight and height to categorise patients as underweight, normal weight, overweight or obese. Bland Altman plots and limits of agreement were also used to assess the levels of agreement between self-report and measured weight, height and BMI. The relatively wide limits of agreements and Bland Altman plots suggests that self-reported weight and height may need to be interpreted with care when used for individual patients. The high level of agreement demonstrated by the high interclass correlations, small mean differences and high kappa values between self-reported and measured weight and height, however, suggests that use of self-report to quantify overweight and obesity in large surveillance studies is acceptable. Based on this high level of agreement between measured and self-reported values identified in Paper One, self-reported weight and height were used in Papers Two, Three, Four and Six to describe overweight and obesity.

Paper Two (Published, Journal of General Internal Medicine): A cross-sectional study examining Australian general practitioners’ identification of their overweight and obese patients

Asking is the first step in the 5As framework. It enables the identification of at-risk patients and is necessary to ensure the initiation of weight-management care by GPs. Paper Two compared 51 GPs’ perceptions of the presence of overweight and obesity with 1,111 patients’ BMI tabulated from patients’ self-reported weight and height. Based on findings from Paper One indicating high agreement between self-reported and measured weight and height, BMI based
on patient self-reported values was perceived to be the gold standard. Sensitivity for GP assessment was 63%, specificity was 89%, positive predictive value was 86%, and negative predictive value (NPV) was 68%. Of obese patients, 46% were accurately identified as obese. Males, those without high blood pressure and those without type 2 diabetes had higher odds of not being identified as overweight or obese by their GPs, whereas obese patients with a level of education of trade/diploma had lower odds of not being recognised by their GPs as overweight or obese. While some variation between GPs’ identification of overweight and obesity was identified, none of the GP characteristics examined was associated with reduced identification of overweight and obesity.

The low sensitivity and NPV identified in Paper Two suggest that a substantial proportion of overweight and obese individuals are unlikely to receive assistance from their GPs with managing their weight. Given that subsequent steps in the 5As framework cannot be undertaken without first identifying at-risk patients, there is an urgent need to implement systematic ways to help GPs with identification of overweight and obesity, particularly for patients at increased odds of not being detected.

**Paper Three (Under editorial review): Clustering of multiple modifiable risk factors for cardiovascular disease and characteristics of high-risk individuals in Australian general practices**

A large proportion of the burden of disease associated with overweight and obesity is related to incidence of cardiovascular disease (CVD). Thus, the assessment of other CVD-related risk factors is likely to be a major component in GPs’ management of overweight and obese patients. Therefore, to provide GPs with an indication of who may be at high risk for CVD in this setting, Paper Three examined the clustering of CVD-related modifiable risk factors (i.e. smoking, insufficient physical activity, at-risk alcohol consumption, overweight or obesity, high
blood pressure, high cholesterol and type 2 diabetes) and the characteristics associated with high-risk individuals, in 2,992 patients. Three clusters were identified: a) a “relatively healthy” group (lowest prevalence of having all risk factors); b) a “high-risk metabolic” group (with high prevalence of high cholesterol, high blood pressure, type 2 diabetes and overweight/obesity); and c) a “high-risk behaviours” group (with high prevalence of at-risk alcohol consumption, depression, overweight/obesity, insufficient physical activity to meet guidelines, and smoking). Only one-third (32%) of the sample were in the “relatively healthy” group, with the remaining 68% being in the “high-risk behaviours” group (24%) and “high-risk metabolic” group (44%). Correlates of being in the “high-risk behaviours” group included being male, younger age (18–39 years), lower level of education and no personal or family history of CVD, whereas correlates of being in the “high-risk metabolic” group were being male, older age (≥40 years), lower level of education and a personal or family history of CVD. Both high-risk groups also had a high prevalence of overweight and obese patients, suggesting that weight management is likely to be a key care priority for high-risk individuals.

**Paper Four (published, BMC Family Practice): A cross-sectional study assessing the self-reported weight-loss strategies used by adult Australian general practice patients**

The third step in the 5As framework is that GPs advise their overweight and obese patients regarding the types of strategies that may be effective in producing weight loss. In order to do this, GPs need to consider the types of strategies previously utilised by their patients. *Paper Four* identified that a large proportion of 1,335 general practice patients (73% obese and 55% overweight) had tried to lose weight in the previous 12 months, with diet and exercise being the most commonly utilised strategies. Fewer than 10% of patients used strategies such as prescription medication, over-the-counter supplements or consulting a weight-loss specialist. The majority of patients who had changed their diets restricted calorie and fat consumption. The
proportion seeking GP advice was low, with only 15% of overweight and 42% of obese patients consulting their GPs prior to trying to lose weight. These findings are reassuring as they indicate that patients are largely utilising evidence-based strategies in their attempts to lose weight. However, the majority of these weight loss attempts are unassisted, with less than half of obese patients consulting their GPs prior to commencing weight-loss strategies. This suggests that substantial opportunities exist for GPs to assist their patients with attempts to change their diets and physical activity levels.


In order for GPs to best assist their overweight and obese patients with changing their lifestyles, effective interventions involving GPs need to be identified. Therefore, *Paper Five* examined the number and effectiveness of methodologically rigorous behavioural weight-loss interventions involving general practitioners. Papers published between 1999 and 2011 were included. Only 16 different studies of moderate-to-good methodological quality were identified. Low-intensity interventions delivered primarily by GPs did not result in clinically significant weight loss in overweight and obese patients. A number of strategies, including non-physician-delivered behavioural intervention with monitoring by GPs, use of meal replacements with dietitian counselling, and behavioural counselling coupled with web-based monitoring, were potentially effective in producing clinically significant weight loss. Given that low-intensity interventions are unlikely to be effective in producing clinically significant weight loss, the findings reported in *Paper Five* suggest that specific studies examining the extent of GP involvement required to produce weight loss need to be conducted.
Paper 6 (*Published*, BMC Medical Research Methodology): A cross-sectional study assessing Australian general practice patients’ intentions, reasons and preferences for assistance with losing weight

The efficacy of an intervention is critical for ensuring successful weight loss. However, if uptake of an efficacious intervention is poor, it is unlikely to provide any significant health benefits to the population. Thus, information on patients’ preferences for help with losing weight is likely to be valuable in helping GPs with *arranging* follow-up weight-management care for their overweight and obese patients. In *Paper Six*, patients’ intention to lose weight in the next six months was examined in 1,305 patients. Of those intending to lose weight, reasons for intending to lose weight and preferences for support with weight management were also examined. A large proportion of patients (85% of those obese, 65% of those overweight and 32% of those of normal weight) reported intending to lose weight in the next six months. Females, those younger (18–24 years), those who were obese, those who had high cholesterol and those who had higher levels of education were significantly more likely to report intending to lose weight. “Health” was the top reason for intending to lose weight in normal weight (38%), overweight (57%) and obese (83%) patients. More than half of overweight (61%) and obese (74%) patients would like help to lose weight from one of the listed personnel, with the dietitian and GP being the most frequently endorsed persons to help patients with changing weight. Almost 90% of participants indicated their willingness to accept telephone-delivered support to manage their weight. Interventions involving assistance from dietitians, delivered face-to-face or over the telephone, focusing on weight loss in the context of improving health, are likely to be acceptable to a large proportion of overweight and obese participants.

In conclusion, the program of research described in this thesis provides key information in the following areas: i) the agreement and reliability of self-reported weight and height in quantifying overweight and obesity in general practice patients; ii) the extent of GP recognition
of overweight and obesity and the characteristics of those at increased odds of not being identified by their GPs; ii) the prevalence and characteristics of high-risk clusters of patients in general practice; iv) the paucity of research examining the role of GPs in weight management; and v) overweight and obese patients’ weight-management practices as well as preferences for help with managing their weight. It is recommended that interventions be implemented to improve GPs’ identification of overweight and obesity as this is a critical first step to improving overall care. Findings from this research further highlight the need for development and rigorous testing of weight-loss interventions that are both acceptable to patients and feasible for delivery in the general practice setting.