Exploring the role of the general practitioner in obesity management in Australian primary care

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Declaration of authorship

I certify that the thesis entitled 'Exploring the role of the general practitioner in obesity management in Australian primary care', submitted for the degree of Doctor of Philosophy of The Australian National University, is the result of my own research. This thesis contains no material extracted in whole or in part from a thesis by which I qualified for or was awarded another degree or diploma.

This compilation thesis contains the following eight papers:

1. Sturgiss EA, Elmitt N, van Weel C, Haesler E, Sargent G, Stevenson A, Harris M, Douglas K. The role of the family doctor in the management of adults who are obese: a scoping review protocol. SpringerPlus 2015;**4**:820 doi: 10.1186/s40064-015-1647-6.
I was responsible for the design of the scoping review protocol, I wrote the initial draft, and then synthsised feedback from all authors. I finalised the manuscript.

2. Sturgiss EA, Elmitt N, Haesler E, van Weel C, Douglas K. The role of the family doctor in the management of adults with obesity: a scoping review. BMJ Open 2018;**8**:e019367. doi: 10.1136/bmjopen-2017-019367
I was responsible for the search and data extraction. I was the first data reviewer and developed the overall synthesis of the findings. I wrote the first draft of the manuscript, collated all feedback from other authors and approved the final version.

3. Sturgiss EA, van Weel C, Ball L, Jansen S, Douglas K. Obesity management in Australian primary care: where has the general practitioner gone? Aust J Prim Health 2016 doi: 10.1071/py16074.
I first developed the concept for this paper. I wrote the first draft, synthesised feedback from the other authors, and then re-wrote the final manuscript that was approved by all authors.

4. Sturgiss EA, Douglas K. A collaborative process for developing a weight management toolkit for general practitioners in Australia—an intervention development study using the Knowledge To Action framework. Pilot and Feasibility Studies 2016;**2**:20 doi: 10.1186/s40814-016-0060-4.
I designed the study protocol and was involved in the data collection. I led the data interpretation. I led the re-deisgn of the program booklets. I prepared the first version of the manuscript, synthesised feedback from the other author, and approved the final manuscript.

5. Sturgiss EA, Elmitt N, Haesler E, van Weel C, Douglas K. Feasibility and acceptability of a physician-delivered weight management programme. Family practice 2017;**34**(1):43-48 doi: 10.1093/fampra/cmw105.
I developed the protocol for the feasibility trial. I was involved in most of the qualitative data collection. I was solely responsible for collection, data entry and interpretation of the quantitative data. I wrote the initial draft, synthesised feedback from the other authors, and re-wrote the final manuscript.

6. Sturgiss E, Haesler E, Elmitt N, van Weel C, Douglas K. Increasing general practitioners' confidence and self-efficacy in managing obesity: a mixed methods study. BMJ Open 2017;**7**(1):e014314 doi: 10.1136/bmjopen-2016-014314.
I led the design of this study and chose the theoretical lens for analysis. I analysed the qualitative data. I synthesised all the data and developed the cohesive narrative of the paper. I wrote the original draft and was responsible for reviewing each draft until finalisation.

7. Sturgiss E, van Weel C. The 5 As framework for obesity management Do we need a more intricate model? Canadian Family Physician 2017;**63**(7):506-08.
I proposed the concept for this article. I wrote the initial draft, synthesised feedback, and re-wrote the final manuscript.

8. Sturgiss EA, Sargent GM, Haesler E, Rieger E, Douglas K. Therapeutic alliance and obesity management in primary care - a cross-sectional pilot using the Working Alliance Inventory. Clinical Obesity 2016;**6**(6):376-79 doi: 10.1111/cob.12167.
I identified Bordin's theory and research on the Working Alliance Inventory in the existing psychological literature. I presented this to the other authors with the idea of using this theoretical framework to better understand GP-led obesity management. I led the study design. I was responsible for the data analysis. I wrote the initial draft of the manuscript, synthesised feedback from the authors and then finalised the manuscript.

_____ _____

Elizabeth Ann Sturgiss

Kirsty Douglas, senior author on behalf of collaborating authors

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Abstract

As obesity prevalence continues to rise, approximately one third of patients seen by Australian general practitioners (GPs) are living with obesity. General practice is the cornerstone of primary care in Australia with 85% of the population seeing a GP at least annually. The current role of the GP in obesity management focuses on care co-ordination with guidelines encouraging the referral of patients to allied health services, including dietitians and exercise physiologists. But multi-disciplinary team care is not always available due to factors such as location and cost, or patients may have a preference for working more closely with their GP. Currently there are no weight management programs where care is delivered by a GP. This doctoral work explores the current role of the GP in obesity management in Australia, outlines an intervention development study for a GP-delivered weight management program, and presents the findings of a feasibility trial of the program.

Following the UK Medical Research Council's Guidelines for the Development of a Complex Intervention, a GP-delivered weight management program was developed. The draft program was based on Australian evidence-based guidelines for obesity management and used a qualitative approach to engage stakeholders to refine the program materials.

Following this intervention development, a six-month feasibility trial was undertaken in five general practices involving 11 GPs and 23 patients. Guided by Normalisation Process Theory, both quantitative and qualitative data were collected. Both GPs and patients reported high rates of acceptability and feasibility, and there was a low dropout rate with only three patients withdrawing. Based on the theoretical framework of Bordin, patients and GPs with a strong therapeutic alliance had better program retention and there was a trend to improvement in some health outcomes. Social cognitive theory suggests that "performance mastery" is the most effective way to develop self-efficacy. This was demonstrated in the feasibility trial with both qualitative and quantitative data showing the GPs improved self-efficacy for obesity management.

Based on the findings in the feasibility trial, a modified approach to obesity management in primary care is suggested with a greater emphasis on therapeutic relationship, person-centredness, and the explicit recognition that care occurs over time and not within one consultation. A GP-delivered weight management program in Australia was demonstrated to be feasible and acceptable to both patients and their GPs. Future research will focus on a pseudo-cluster randomised controlled trial for effectiveness, alongside further development of a measure for therapeutic alliance in general practice for research, teaching, and clinical purposes.

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Ostrom's Law

A resource arrangement that works in practice, can work in theory.

Elinor Ostrom,

2009 Nobel Laureate in Economic Sciences

Preface

Sandy[1] was a 35 year old woman and the primary carer of her two sons aged six and three. She worked part time in a government policy role and her husband worked full time at the local University. She was in good health and enjoyed her time at home and work. I had been her general practitioner (GP) in a suburban clinic for about two years and had seen her mostly during consultations for her children with acute illnesses.

She presented to me one day concerned about her increasing weight. Since the birth of her last child she had gained about 15 kilograms and was struggling to work out why. After a thorough history and assessment, we concluded that a change in her lifestyle would be beneficial. As per the Australian guidelines for best practice, I suggested she see a dietitian. But Sandy asked,

"Is there anything you can do for me as my GP?"

I suggested she come and see me in about one month to be re-weighed and we could go from there. I felt I had nothing else to offer her. It was this question from my patient that prompted this doctoral work.

About me

I am a clinical GP and I completed my specialist training with the Royal Australian College of General Practitioners in 2012. I was fortunate to be trained by highly skilled and effective GPs and I continue to enjoy my clinical work. I have worked with some patients in my clinic on weight management, but it has never been a major part of my clinical load. I have previously worked as a forensic physician and was inducted into the Royal Australasian College of Pathologists as a forensic physician. I no longer continue this work. I have never personally accepted any donations or support from pharmaceutical or surgical device companies.

Before I started this doctoral work, I understood obesity through the medical lens of my training – that "eat less, move more" was a good model for management, and that with the right individual choices, obesity could be reversed. But patient feedback in both my clinical and research work has made me more reflective about the causes and realities of obesity. I have learnt more about the biology of weight, and why it is difficult to lose weight and maintain weight loss from a biological

[1] This is an amalgamated case of patients I have seen within my clinical general practice.

perspective. I have come to understand the influence of our lived environment on the choices that we make in our day to day lives, as well as the biological drivers that influence choice. I have started to appreciate the negative influence of shame and stigma that worsen outcomes for people living with obesity. I now understand obesity to be a chronic disease with distinct biological changes that is best managed in a person-centred way as part of holistic general practice care.

Chapter 1

Introduction

Definition of obesity

Obesity has been an Australian national health priority since 2008.[1] Approximately one-third of the adult population has a body weight that meets the criteria for obesity.[2] The Body Mass Index (BMI) is a person's weight in kilograms, divided by their height, in metres squared.[3] The BMI is a useful measure to determine population risk for weight-related chronic disease, but for an individual it must be adjusted for muscle mass and ethnicity.[3] Since 2000 the World Health Organisation has defined obesity as a high body weight that impairs the health of the individual.[4] For an individual, a high body weight is not enough to diagnose obesity and the person must also have impaired health related to the body weight.[5]

The human race consists of people with widely varying body shapes and sizes, and simply having a high body weight is not a health issue.[6] Depending on a person's genetic make-up, their ethnicity, and in-utero exposures, their normal body habitus will vary within a healthy range specific to them. In some people the accumulation of body fat, particularly in the mid-section of the body around the abdomen, increases their risk for developing chronic disease like diabetes and cardiovascular disease.[4-6] Over time if a person maintains a higher level of excess body fat, it is theorised that the hormonal system controlling insulin levels, feeling of satiety, and basal metabolic rate, can shift to reset to support this higher body weight.[7] This reset in the hormonal system leads to extreme difficulty in reducing body weight.[8] This is demonstrated by epidemiological data from the UK, where an individual with a BMI greater than 30 rarely returns to a body weight within a healthy weight range.[9]

Obesity and health risk

Patients with obesity, that is people with a high body weight that is impairing their health, have a higher risk of developing chronic disease and associated morbidity.[10-13] The Edmonton Obesity Severity Scale (EOSS) is a useful clinical tool for estimating the risk to a person's health associated with obesity.[14] The scale ranges from 0, where there are no impacts on the persons physical or mental health from obesity, through to stage 4 where there are life-limiting, end stage complications of obesity.[14] The EOSS predicts an individual's mortality risk, whereas the BMI in isolation does not.[5,14] To improve the health outcomes of patients with obesity, those at a higher EOSS stage should be assisted to reduce their longer term morbidity and mortality risk. It is only those patients

who are experiencing adverse physical or mental health effects associated with their weight that will benefit from reducing their body weight.[5,6,14]

Conversely, the health of an individual can be improved even when their body weight does not change. For example, cardiovascular fitness,[15-17] mental health,[18] and musculoskeletal condition,[19] are all improved with an increase in physical activity, with the biggest health gain seen in sedentary people who start to do small amounts of exercise.[20,21] Regardless of body weight, people can become healthier by improving the quality of their nutrition,[22,23] and increasing their physical activity levels.[20] These lifestyle changes continue to form the foundation for all management options for obesity.[2424] Even after bariatric surgery, nutrition quality and physical activity are important for the success of the treatment.[25]

Current treatment for obesity

The advice for all patients living with obesity is to eat a healthy nutritious diet and have an active lifestyle.[3] Even in patients who also require more intensive treatments, such as medication or bariatric surgery, the enhancement of their nutrition and physical activity levels is helpful. Lifestyle enhancements are supported through behavioural techniques such as goal setting, self-monitoring, stimulus control, cognitive restructuring, problem solving, and mindfulness.[3] With lifestyle enhancement, expected weight loss is 5 to 10% of body weight which is associated with improvements in overall health.[24]

This thesis will focus on the nutrition, physical activity, and behavioural support components of obesity management which are fundamental to all successful strategies.

The most common consultation framework that is used to support lifestyle changes is the "5As" of obesity management.[26] This framework was originally developed by the United States Preventive Services Task Force to assist practitioners with patients who wished to cease smoking.[27] The "5As" are slightly different across the world and in Australia they stand for: Ask, Assess, Advise/Agree, Assist, Arrange.[28] The framework suggests the steps that a practitioner can work through in a consultation to develop a management plan for a patient living with obesity. The framework has been applied extensively in the obesity literature, in particular the work originating from North America.[29-31] The potential limitations of the 5As will be further discussed in Chapter 7 where an alternative approach to the consultation is proposed.

The gold standard for obesity management is via an interdisciplinary team that usually involves a person's regular practitioner (in Australia this is usually a GP), a dietitian, and potentially other allied

health professionals such as exercise physiologists, physiotherapists, and psychologists.[3] The regular practitioner would play the role of care co-ordinator and refer the person to the services most appropriate to them.[3] The person may attend individual sessions, or therapy offered in a group setting.[24] Some practitioners discuss the option of a commercial weight management program with their patient.[3] Large urban centres in Australia usually have tertiary bariatric clinics that are generally focused on preparing people for bariatric surgery.[32] Overall in Australia, most bariatric surgery is done in the private healthcare system with very little surgery funded in the public system.[33]

Nurses in general practice are involved in the management of chronic health conditions such as diabetes and asthma.[34] The British "Counterweight" program for weight management is delivered by nurses in the general practice setting, however there have been no randomised trials for this approach[35] and there are varying reports of success when the primary outcome of interest is weight.[36] Nurses were studied when they delivered the "General Practice" arm of an eight arm study of obesity management in the UK, and were not found to be effective on weight loss.[36] The role of the nurse in general practice continues to be explored in other research programs with the Counterweight program being investigated by a team from the University of New South Wales.[37] This doctoral work will not replicate this work, and instead will focus on the potential role of the GP to add to the knowledge base of primary care.

The role of primary care in the delivery of behavioural interventions for obesity has been explored and in a meta-analysis from 2014 was found to have a null effect.[38] However, of the five trials included in this meta-analysis, the GP was involved in delivering the intervention in only one study from Switzerland.[39] In this study, the GP delivered a group based program alongside allied health professionals.[39] This Swiss study was also the only one that was effective for weight loss, although the authors of the meta-analysis reported a high risk of bias due to unclear randomisation processes in the study.[38,39]

In recent times the provider-patient relationship has been found to be important to patient satisfaction in obesity management trials.[40] In the general literature, the strength of the patient-clinician relationship was found to be associated with health outcomes in a meta-analysis of trials in general healthcare.[41] Furthermore a one-off brief intervention for smoking cessation from a trusted GP was found to be as effective as multiple sessions of intensive counselling from a practice nurse.[42] In the US the density of primary care physician availability between counties was inversely associated with the prevalence of obesity.[43] As lifestyle change is essential to improving outcomes for patients living with obesity, is it possible that the GP-patient relationship is a missing link in the currently available primary care programs?

Barriers to current treatment

There are many reasons why people living with obesity have trouble accessing currently available treatments. It is known that in rural settings there is less availability of allied health services and patients may have to travel extensive distances to access care.[44] Under the Australian universal healthcare system, patients can access unlimited visits with a GP and most GP services are provided at no cost at the point of care.[45] Whereas allied health services are only funded for up to five visits per annum for patients with chronic disease.[45] This can make cost an issue for patients, especially for those living in poverty.[46] The burden of time spent in healthcare for patients with chronic disease is significant and accessing a variety of different practitioners, in different settings, can add to this burden.[47,48] These barriers make it necessary to look for alternative options to care for affected patients. The barriers to primary care obesity management will be explored further in Chapter 2b).

Additionally, there are many studies on how GPs perceive managing obesity. Most studies confirm that GPs believe that they do have a role in managing patients with obesity.[49] When questioned about barriers to GPs providing care, common themes include a lack of confidence and self-efficacy for providing management, patients disinterest in weight management, limited resource availability, and resistance against community norms of weight.[33,49,50] The development of a weight management program for use in general practice could allay some of these barriers, particularly those related to low self-efficacy ("professional self-efficacy" is discussed in Chapter 6).

Weight related stigma is the unfair treatment of people living with obesity and is a universal phenomenon in developed countries.[51-53] Outcomes of this stigma include poor experiences during interactions with healthcare providers, reduced job and promotion opportunities, verbal harassment and bullying, and even physical assault.[54,55] The effects of this in healthcare have included patients avoiding health visits due to fear of being lectured or shamed.[56] It is found that people who feel stigmatised about their weight have steeper weight gain trajectories, and higher overall body weight.[55] Factors related to stigma contribute to worse health outcomes for people living with obesity.[57]

Having a general practice workforce that is skilled in managing obesity may help to reduce weight related stigma.[58] Firstly, patients attend their GP for many different health conditions and the GP has the opportunity to embed weight management within care for other problems.[59] Secondly, being cared for by a GP that cares for you holistically and is aware of your social context, could reduce the weight related stigma in providing care for people with obesity.[60] Person-centred care will be explored further in Chapters 2b) and 7.

Theory informed obesity interventions

Commonly, primary care research does not explicitly state the theory that informed the development and implementation of an intervention.[61] This is also true in obesity research – a systematic review of physical activity for people with obesity found that one-third of the interventions had no reference to any theoretical basis.[62] The most common theories used in obesity research are Social Cognitive Theory and the Transtheoretical Model which are used to explain individual behaviour change – both will be described in Chapter 3. The Theory of Planned Behaviour has also been used, however it is becoming a contested theory as it places strong emphasis on rational decision making, and individual choice.[63] For progress in obesity interventions, a strong theoretical basis for intervention development is essential (MRC).

What is a General Practitioner?

In Australia, a general practitioner (GP) is a medical doctor who has undertaken specialty post-vocational training in family medicine. General practice became a college-based medical specialty in 1958, but was not formally recognised as a specialty by the Australian Federal Government until 1996.[64] Between 1989 and 1995 doctors who had been working in the community as a GP could be "grandfathered" into the college.[64] Since 1989 Medicare, the Australian universal healthcare system, pays doctors recognised as specialist GPs a higher rate than those who are not.[6560] Doctors who did not meet the grandfathering criteria, and those that graduated after this time, were required to complete specialty training in general practice to be able to have access to the higher rebate amounts through Medicare.[65]

In Australia the term "GP" is not protected and it is possible for doctors without specialty training to refer to themselves as a "GP" and practice under this banner. There are approximately 4 000 doctors currently working in Australia as "non- vocationally registered GPs".[66] They include doctors who have been working for decades but did not complete the grandfathering process, doctors who have been trained overseas, and locally trained doctors who have not completed specialty training. Only doctors with specialty training in general practice can register with the national medical board as a specialist in general practice. In this thesis, "GPs" refers to doctors with specialty training in general practice.

General practice is based on five fundamental pillars that have been defined through the work of primary care research.[67] General practice is:

- The first point of care in the health system;

- Delivered in a continuous fashion to the person over time;
- The provision of whole person care - where all disease states are cared for regardless of the body system affected;
- Provided in a person-centred manner taking into account the beliefs, values, and goals of the individual within their family and community
- The central co-ordination point within the healthcare system.[60,67,68]

In Australia the majority of GPs work in practices that are either privately owned, or owned by corporate entities.[69] The average number of full time equivalent GPs per practice is 5.5 which consists of, on average, 7.5 individual practitioners.[69] In 2015-16, 84% of general practices had a practice nurse within their facility and 60% had a co-located psychologist.[69] On average, there are 0.3 full time equivalent nurses for every full time GP. There continues to be a small number of GPs who are working in practices without nursing or allied health support, and for those with nursing support the number of nursing hours offered per week are far fewer than GP hours.[69]

General Practitioners managing obesity

Cross sectional data documenting GP visits in Australia show that 8 per 1 000 patient visits are coded as being related to obesity.[69] As obesity management is often embedded within consultations about diabetes, cardiovascular disease, and osteoarthritis[59] this is likely to be an underestimate of the number of visits that involve a discussion about healthy lifestyles. It is also shown in this data that 25% of patient visits about obesity are referred to allied health providers, which makes it the most referred chronic health condition within the general practice setting.[69] This suggests that GPs are already following current guidelines to refer to allied health whenever possible.[3]

Both in Australia and internationally the low confidence of GPs in managing patients with obesity is well documented.[70] Reported barriers to care include previous poor experience with patient outcomes, a lack of time available in consultation, a perception of futility in managing obesity, and a general sense that patients are not motivated to change behaviour.[58,70] Obesity is a difficult condition to manage with issues of stigmatisation, chronicity, and multi-factorial causes all part of a typical patient case.[58] Nevertheless, as expert generalists, GPs have the required skillset for the holistic management of obesity.[58,71-73]

The possible strengths of general practice for obesity management

General practice has strengths that could be applied to obesity care, as at the heart of general practice is expert generalism. Expert generalism is the ability to manage the health of a person, no matter what condition they are dealing with, encompassing all body systems and stages of life, whilst taking into account the beliefs and values of the person, and understanding the family and community within which they live.[71] Expert generalist care is cost effective, reduces fragmentation within the health system, and is particularly useful for conditions where uncertainty in diagnosis and/or prognosis is a problem.[72] Obesity fits these criteria as it is a condition that affects multiple body systems, as well as the health of families and communities. From a theoretical framework it would seem GPs are well placed to partake in the management of obesity. The role of the GP is being increasingly recognised in the Australian literature as more patients have this chronic health problem.[58] Furthermore, as obesity is a chronic condition it fits within the framework for chronic disease care that lies mostly with general practice.[74,75]

Why do we need to know about the role of the GP?

There is increasing evidence that interdisciplinary team care in the management of chronic disease leads to superior outcomes for patients.[76] This is reflected in many guidelines for the management of obesity in primary care where the GP is the co-coordinator of care and the patient is managed by allied health professionals such as dietitians and exercise physiologists.[3] But there are many circumstances where interdisciplinary care may not be possible or in line with the patient's wishes. For example 31% of the Australian population live in inner regional, rural, and remote areas where allied health services are harder to access.[44] Additionally, allied health care is not funded to the same extent as GP visits, so patients may not be able to afford the added cost of seeking team based care.[45,46] And finally, as seen in a cross sectional survey of Australian general practice in New South Wales, patients may have a preference for working with their GP on issues to do with their obesity.[77]

Although this thesis focuses on the role of the GP in obesity care, it is not seeking to declare that GPs will be able to "fix" the obesity crisis that is facing Australia. The research questions for this thesis are:

1. If a patient presents requesting their GP's assistance with weight management, is it acceptable and feasible for the GP to manage their care?

2. If a patient has a weight related issue, and there are no allied health services available to the patient due to either cost or location, is it feasible for the GP to assist with weight management?

Currently in Australia there are no weight management programs that can be delivered by a GP within their rooms. There are GPs across Australia who have implemented different options within their own practice,[78] but as yet nothing is offered at scale or recommended by the Royal Australian College of General Practitioners. If GP care alone is not acceptable nor feasible for weight management, then we should not offer this to our patients. But if GP care can offer assistance to patients under certain conditions, a program that could be implemented nationally could be of great benefit.

The obesity literature firmly acknowledges that lifestyle behaviour change is helpful for the health of people living with obesity and that improved nutrition and physical activity underpin every management option for obesity. Using their skills in expert generalism, GPs are helpful in chronic disease management, and additionally some patients want to work with their GP on weight management. The low confidence of GPs throughout the world in the management of obesity is well documented and the need for better supports for general practice in this area is recognised.

This thesis works to fill the gap of in-consultation general practice supports for the management of patients living with obesity. In Chapter 2 we commence with a narrative review on current practice and the potential strengths of general practice for obesity care, followed by a scoping review examining the current literature on the management of obesity in primary care. Chapter 3 outlines the theoretical frameworks that have guided the thesis. The intervention development study, that produced the GP-delivered weight management program (The Change Program), is described in Chapter 4. Chapters 5 and 6 outline the results of the feasibility study of The Change Program with a focus on the self-efficacy of GPs for weight management. Chapter 7 proposes a modification to the 5As framework that currently informs primary care management of obesity to emphasise the importance of therapeutic alliance, person-centredness, and continuity of care. And Chapter 8 describes the application of a measurement of therapeutic alliance from psychology in the feasibility trial that showed a trend towards better engagement and some health outcomes in doctor-patient dyads where the alliance was strong. The final Chapter 9 summarises the overall aims, outcomes, and discoveries of this doctoral work.

References

1. Australian Institute of Health and Welfare. National health priority areas. Australia: Australian Government, 2017.
2. Overweight and Obesity. In: Australian Bureau of Statistics, ed. National Health Survey: First Results, 2014-15. Canberra, Australia: Australian Bureau of Statistics,; 2015.
3. Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia. In: Council NHaMR, editor. Melbourne: National Health and Medical Research Council; 2013.
4. World Health Organization. Obesity: preventing and managing the global epidemic. Geneva: World Health Organization, 2000.
5. Sharma AM, Campbell-Scherer DL. Redefining obesity: Beyond the numbers. *Obesity* 2017; **25**(4): 660-1.
6. Bacon L, Aphramor L. Weight Science: Evaluating the Evidence for a Paradigm Shift. *Nutrition Journal* 2011; **10**(1): 9.
7. Sumithran P, Prendergast LA, Delbridge E, et al. Long-Term Persistence of Hormonal Adaptations to Weight Loss. *New England Journal of Medicine* 2011; **365**(17): 1597-604.
8. Fothergill E, Guo J, Howard L, et al. Persistent metabolic adaptation 6 years after "The Biggest Loser" competition. *Obesity* 2016; **24**(8): 1612-9.
9. Fildes A, Charlton J, Rudisill C, Littlejohns P, Prevost AT, Gulliford MC. Probability of an Obese Person Attaining Normal Body Weight: Cohort Study Using Electronic Health Records. *American journal of public health* 2015; **105**(9): e54-9.
10. World Health Organisation. Global Action Plan for the prevention and control of noncommunicable diseases 2013-2020. Geneva: World Health Organisation, 2013.
11. Chan JM, Rimm EB, Colditz GA, Stampfer MJ, Willett WC. Obesity, fat distribution, and weight gain as risk factors for clinical diabetes in men. *Diabetes care* 1994; **17**(9): 961-9.
12. Manson JE, Willett WC, Stampfer MJ, et al. Body Weight and Mortality among Women. *New England Journal of Medicine* 1995; **333**(11): 677-85.
13. Colditz GA, Willett WC, Rotnitzky A, Manson JE. Weight gain as a risk factor for clinical diabetes mellitus in women. *Annals of internal medicine* 1995; **122**(7): 481-6.
14. Sharma AM, Kushner RF. A proposed clinical staging system for obesity. *International journal of obesity (2005)* 2009; **33**(3): 289-95.
15. Poirier P, Despres JP. Exercise in weight management of obesity. *Cardiology clinics* 2001; **19**(3): 459-70.
16. Lakka TA, Bouchard C. Physical activity, obesity and cardiovascular diseases. *Handbook of experimental pharmacology* 2005; (170): 137-63.
17. Jakicic JM, Otto AD. Physical activity considerations for the treatment and prevention of obesity. *The American Journal of Clinical Nutrition* 2005; **82**(1): 226S-9S.
18. Hillman CH, Erickson KI, Kramer AF. Be smart, exercise your heart: exercise effects on brain and cognition. *Nat Rev Neurosci* 2008; **9**(1): 58-65.
19. Martinez JA, Wertheim BC, Thomson CA, et al. Physical Activity Modifies the Association between Dietary Protein and Lean Mass of Postmenopausal Women. *Journal of the Academy of Nutrition and Dietetics* 2017; **117**(2): 192-203.e1.
20. Barwais FA, Cuddihy TF, Tomson LM. Physical activity, sedentary behavior and total wellness changes among sedentary adults: a 4-week randomized controlled trial. *Health and quality of life outcomes* 2013; **11**: 183.
21. Jalayondeja C, Jalayondeja W, Mekhora K, Bhuanantanondh P, Dusadi-Isariyavong A, Upiriyasakul R. Break in Sedentary Behavior Reduces the Risk of Noncommunicable Diseases and Cardiometabolic Risk Factors among Workers in a Petroleum Company. *International Journal of Environmental Research and Public Health* 2017; **14**(5): 501.

22. Blumenthal JA, Babyak MA, Hinderliter A, et al. Effects of the DASH Diet Alone and in Combination With Exercise and Weight Loss on Blood Pressure and Cardiovascular Biomarkers in Men and Women With High Blood Pressure: The ENCORE Study. *Archives of internal medicine* 2010; **170**(2): 126-35.
23. Allan GM, Ivers N, Sharma AM. Diets for weight loss and prevention of negative health outcomes. *Canadian Family Physician* 2011; **57**(8): 894-5.
24. Wadden TA, Webb VL, Moran CH, Bailer BA. Lifestyle Modification for Obesity: New Developments in Diet, Physical Activity, and Behavior Therapy. *Circulation* 2012; **125**(9): 1157-70.
25. Woodlief TL, Carnero EA, Standley RA, et al. Dose response of exercise training following roux-en-Y gastric bypass surgery: A randomized trial. *Obesity (Silver Spring)* 2015; **23**(12): 2454-61.
26. Vallis M, Piccinini-Vallis H, Sharma AM, Freedhoff Y. Modified 5 As: Minimal intervention for obesity counseling in primary care. *Canadian Family Physician* 2013; **59**(1): 27-31+e1-e5.
27. Tobacco Use and Dependence Guideline Panel. Treating tobacco use and dependence: 2008 update. Rockville, MD: US Department of Health and Human Services, 2008.
28. Smoking, nutrition, alcohol, physical activity (SNAP): A population health guide to behavioural risk factors in general practice. Melbourne: The Royal Australian College of General Practitioners, 2015.
29. Torti J, Luig T, Borowitz M, Johnson JA, Sharma AM, Campbell-Scherer DL. The 5As team patient study: patient perspectives on the role of primary care in obesity management. *BMC Fam Pract* 2017; **18**(1): 19.
30. Osunlana AM, Asselin J, Anderson R, et al. 5As Team obesity intervention in primary care: development and evaluation of shared decision-making weight management tools. *Clinical obesity* 2015; **5**(4): 219-25.
31. Campbell-Scherer DL, Asselin J, Osunlana AM, et al. Implementation and evaluation of the 5As framework of obesity management in primary care: design of the 5As Team (5AsT) randomized control trial. *Implementation Science* 2014; **9**(1): 78.
32. Australian Institute of Health and Welfare. Weight loss surgery in Australia 2014–15: Australian hospital statistics. Canberra: Australian Institute of Health and Welfare, 2017.
33. Kim KK, Yeong L-L, Caterson ID, Harris MF. Analysis of factors influencing general practitioners' decision to refer obese patients in Australia: a qualitative study. *BMC Family Practice* 2015; **16**: 45.
34. Young J, Eley D, Patterson E, Turner C. A nurse-led model of chronic disease management in general practice: Patients' perspectives. *Australian Family Physician* 2016; **45**: 912-6.
35. Ross H, Laws R, Reckless J, Lean M. Evaluation of the Counterweight Programme for obesity management in primary care: a starting point for continuous improvement. *British Journal of General Practice* 2008; **58**(553): 548-54.
36. Jolly K, Lewis A, Beach J, et al. Comparison of range of commercial or primary care led weight reduction programmes with minimal intervention control for weight loss in obesity: Lighten Up randomised controlled trial. *BMJ* 2011; **343**.
37. Gray J, Hoon E. Experiencing obesity, seeking support in general practice. 9th Health Services and Policy Research Conference. Melbourne; 2015.
38. Hartmann-Boyce J, Johns DJ, Jebb SA, Summerbell C, Aveyard P. Behavioural weight management programmes for adults assessed by trials conducted in everyday contexts: systematic review and meta-analysis. *Obesity reviews : an official journal of the International Association for the Study of Obesity* 2014; **15**(11): 920-32.
39. Munsch S, Biedert E, Keller U. Evaluation of a lifestyle change programme for the treatment of obesity in general practice. *Swiss medical weekly* 2003; **133**(9-10): 148-54.
40. Bennett WL, Wang N-Y, Gudzune KA, et al. Satisfaction with primary care provider involvement is associated with greater weight loss: Results from the practice-based power trial. *Patient education and counseling* 2015; **98**(9) 1099-105.

41. Kelley JM, Kraft-Todd G, Schapira L, Kossowsky J, Riess H. The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PloS one* 2014; **9**(4): e94207.
42. van Rossem C, Spigt M, Viechtbauer W, Lucas AEM, van Schayck OCP, Kotz D. Effectiveness of intensive practice nurse counselling versus brief general practitioner advice, both combined with varenicline, for smoking cessation: a randomized pragmatic trial in primary care. *Addiction*: n/a-n/a.
43. Gaglioti AH, Petterson S, Bazemore A, Phillips R. Access to Primary Care in US Counties Is Associated with Lower Obesity Rates. *Journal of the American Board of Family Medicine : JABFM* 2016; **29**(2): 182-90.
44. National Rural Health Alliance. Under pressure and under-valued: allied health professionals in rural and remote areas. Available at http://ruralhealth.org.au/sites/default/files/position-papers/position-paper-04-11-05.pdf [Verified 5 October 2017]: National Rural Health Alliance, 2004.
45. Foster MM, Cornwell PL, Fleming JM, et al. Better than nothing? Restrictions and realities of enhanced primary care for allied health practitioners. *Australian Journal of Primary Health* 2009; **15**(4): 326-34.
46. Pearce-Brown CL, Grealish L, McRae IS, et al. A local study of costs for private allied health in Australian primary health care: variability and policy implications. *Australian Journal of Primary Health* 2011; **17**(2): 131-4.
47. Jonas DE, Ibuka Y, Russell LB. How Much Time Do Adults Spend on Health-related Self-care? Results from the American Time Use Survey. *The Journal of the American Board of Family Medicine* 2011; **24**(4): 380-90.
48. Safford MM, Russell L, Suh D-C, Roman S, Pogach L. How Much Time Do Patients with Diabetes Spend on Self-Care? *The Journal of the American Board of Family Practice* 2005; **18**(4): 262-70.
49. Claridge R, Gray L, Stubbe M, Macdonald L, Tester R, Dowell AC. General practitioner opinion of weight management interventions in New Zealand. *Journal of primary health care* 2014; **6**(3): 212-20.
50. Dixon JB, Hayden MJ, O'Brien PE, Piterman L. Physician Attitudes, Beliefs and Barriers towards the Management and Treatment of Adult Obesity: A Literature Review. *Australian Journal of Primary Health* 2008; **14**(3): 9-18.
51. Alberga AS, Russell-Mayhew S, Ranson K, McLaren L, Ramos-Salas X, Sharma AM. Future research in weight bias: what next? *Obesity* 2016; **24**.
52. Alberga AS, Russell-Mayhew S, von Ranson KM, McLaren L. Weight bias: a call to action. *Journal of Eating Disorders* 2016; **4**(1): 34.
53. Ramos Salas X. The ineffectiveness and unintended consequences of the public health war on obesity. *Canadian journal of public health = Revue canadienne de sante publique* 2015; **106**(2): e79-81.
54. Phelan SM, Burgess DJ, Puhl R, et al. The Adverse Effect of Weight Stigma on the Well-Being of Medical Students with Overweight or Obesity: Findings from a National Survey. *Journal of General Internal Medicine* 2015; **30**(9): 1251-8.
55. Brewis AA. Stigma and the perpetuation of obesity. *Social Science & Medicine* 2014; **118**(Supplement C): 152-8.
56. Phelan SM, Burgess DJ, Yeazel MW, Hellerstedt WL, Griffin JM, van Ryn M. Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. *Obesity Reviews* 2015; **16**(4): 319-26.
57. Forhan M, Salas XR. Inequities in healthcare: a review of bias and discrimination in obesity treatment. *Canadian journal of diabetes* 2013; **37**(3): 205-9.
58. Jansen S, Desbrow B, Ball L. Obesity management by general practitioners: the unavoidable necessity. *Aust J Prim Health* 2015; **21**(4): 366-8.

59. Asselin J, Osunlana AM, Ogunleye AA, Sharma AM, Campbell-Scherer D. Missing an opportunity: the embedded nature of weight management in primary care. *Clinical obesity* 2015; **5**(6): 325-32.
60. Starfield B. Is Patient-Centered Care the Same As Person-Focused Care? *The Permanente Journal* 2011; **15**(2): 63-9.
61. Hooft van Huysduynen EJC, Hiddink GJ, van Woerkum CJM. The use of theory in research on nutrition guidance practices by primary care physicians from 1995 to October 2008: a review. *Family practice* 2012; **29**(suppl_1): i56-i60.
62. Olander EK, Fletcher H, Williams S, Atkinson L, Turner A, French DP. What are the most effective techniques in changing obese individuals' physical activity self-efficacy and behaviour: a systematic review and meta-analysis. *The International Journal of Behavioral Nutrition and Physical Activity* 2013; **10**: 29-.
63. Sniehotta FF, Presseau J, Araújo-Soares V. Time to retire the theory of planned behaviour. *Health Psychology Review* 2014; **8**(1): 1-7.
64. Harris MF, Zwar NA. Reflections on the history of general practice in Australia. *The Medical journal of Australia* 2014; **201**(1 Suppl): S37-40.
65. Woodhouse F. Medicare, mayhem and the Vocational Register 1989 –1996. Melbourne: The Royal Australian College of General Practitioners.
66. GP Workforce Statistics – 2001-02 to 2015-16. 2017. http://www.health.gov.au/internet/main/publishing.nsf/content/General+Practice+Statistics-1 (accessed 5 October 2017).
67. Chapter 1: Meeting people's health needs. In: Kidd M, ed. The contribution of family medicine to improving health systems: a guidebook from the World Organization of Family Doctors. 2nd ed. London: Radcliffe Publishing; 2013: 1-13.
68. The Royal Australian College of General Practitioners. What is General Practice? 2017. https://www.racgp.org.au/becomingagp/what-is-a-gp/what-is-general-practice/ (accessed 5 October 2017).
69. Britt H, Miller G, Henderson J, et al. General practice activity in Australia 2015-16. Sydney: Sydney University Press; 2016.
70. Ashman F, Sturgiss E, Haesler E. Exploring Self-Efficacy in Australian General Practitioners Managing Patient Obesity: A Qualitative Survey Study. *International journal of family medicine* 2016; **2016**: 8212837.
71. Reeve J, Irving G, Freeman G. Dismantling Lord Moran's ladder: the primary care expert generalist. *The British Journal of General Practice* 2013; **63**(606): 34-5.
72. Stange KC. The Problem of Fragmentation and the Need for Integrative Solutions. *The Annals of Family Medicine* 2009; **7**(2): 100-3.
73. Stange KC. The Generalist Approach. *Annals of Family Medicine* 2009; **7**(3): 198-203.
74. Australian Health Ministers' Advisory Council. National Strategic Framework for Chronic Conditions. Canberra: Australian Government, 2017.
75. Harris MF, Zwar NA. Care of patients with chronic disease: the challenge for general practice. *The Medical journal of Australia* 2007; **187**(2): 104-7.
76. Wagner EH. The role of patient care teams in chronic disease management. *BMJ : British Medical Journal* 2000; **320**(7234): 569-72.
77. Tan D, Zwar NA, Dennis SM, Vagholkar S. Weight management in general practice: what do patients want? *The Medical journal of Australia* 2006; **185**(2): 73-5.
78. Cao TT. A New Model of Weight Loss Clinic in General Practice Using Multidisciplinary Approach in Group Sessions. GP14. Adelaide; 2014.

Chapter 2

The role of the general practitioner in adult obesity management – a narrative review and scoping review

Chapter 2 outlines how the literature was used to inform this doctoral work. This chapter is composed of two parts:

a) A scoping review that examines the literature involving GPs in the management of adults with obesity. Initially, a systematic review of randomised controlled trials found only one study that involved a family doctor or GP in the delivery of the intervention[1]. Our search strategy was then broadened using a scoping strategy to further explore this substantial gap in the literature. The protocol for the scoping review was published prospectively and is presented in part i). "Family doctor" was the term used to describe a GP in this work to best cover evidence from across the world, including North America.
   Part ii) presents the results of the scoping review that covered all literature involving a GP, or family doctor, in obesity management. This scoping review demonstrated that GPs are rarely used in the delivery of interventions for obesity in primary care. Further, there is a mismatch between the description of how guidelines describe obesity management, and what is being research in the academic space.
b) A narrative review that concentrates on the role that GPs currently play in Australia in the management of adults with obesity. It synthesises the literature on obesity management in primary care, expert generalism that underpins general practice, person-centred care and its benefits, and finally the interaction between general practice and public health policy. The paper focuses on the strengths of general practice that could bring benefit to obesity care. A case is made for the increased involvement of GPs in the management of patients with obesity.

Reference

Sturgiss E, Douglas K, Res S, Stevenson A, Kathage R. Treating overweight and obese adults in General Practice – A systematic review. Obesity Research & Clinical Practice, 2014; 8:97-8.

Chapter 2a)

i) The role of the family doctor in the management of adults who are obese: a scoping review protocol.

Reference: Sturgiss EA, Elmitt N, van Weel C, Haesler E, Sargent G, Stevenson A, Harris M, Douglas K. The role of the family doctor in the management of adults who are obese: a scoping review protocol. SpringerPlus 2015;**4**:820 doi: 10.1186/s40064-015-1647-6.

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STUDY PROTOCOL

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The role of the family doctor in the management of adults who are obese: a scoping review protocol

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Abstract

Background: The role of family doctors in the management of obesity in primary care will become increasingly important as more of the adult population become overweight or obese. Having a solid understanding of the family doctor's role as a sole practitioner is important for supporting practitioners in providing patient care and for informing future research.

Objective: The purpose of this paper is to describe a protocol for a scoping review that aims to examine and map the current research base for the role of the family doctor in managing adults who are overweight or obese.

Methods: This scoping review is based on the methodology as described by the Joanna Briggs Institute which involves final consultation with stakeholders. Two reviewers (ES, NE) will be responsible for the iterative development of a search strategy based on the basic initial search terms obesity, doctor and primary care. Black and grey literature will be searched to elucidate any manuscripts involving the family doctor in the management of adults who are overweight or obese. A customised data extraction tool will be used to collect relevant items from each manuscript.

Results: Data extraction will expose the role family doctors are playing in obesity management in all stages of research including recruitment, intervention or as a control group. By looking at a broad scope of manuscripts we will discover the family doctor's role as portrayed in research, in international guidelines and by peak bodies. We will also determine if there are any gaps in the research base.

Conclusion: This protocol describes a scoping review that will illustrate the supporting international research for the role family doctors are playing in the management of adults who are overweight or obese. Scoping of the international literature will then be translated for Australian primary care.

Keywords: Obesity, Overweight, Adults, Primary care, General practitioner, Family doctor, Primary care physician

Background

The proportion of overweight and obese patients seen in general practice in Australia has steadily increased since 1998. The prevalence of overweight and obese patients increased from 51.8 % (95 % CI 51.2–52.4) in 1998–00 to 58.8 % (95 % CI 58.2–59.5) in 2006–08. It has been estimated from this data that approximately 3 million patients who presented to their GP from 2006–08 were overweight or obese (Valenti 2009).

GPs are usually the first point of care in the Australian health care system. GPs may identify patients who are overweight and not aware, or may be approached by patients for assistance in losing weight. A survey of patients in five NSW practices found that patients identified GPs as having a role is assisting with weight management and 78 % of patients were keen to be regularly reviewed by their GP for weight management (Tan et al. 2006). There is acknowledgement that GPs could be doing more for their patients who are obese

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and additional supports are needed for them to do this (Jansen et al. 2015; Bennett et al. 2015).

This scoping review aims to identify the role of the family doctor in obesity management by evaluating the current international evidence. It stems from an attempt to perform a systematic review of randomised controlled trials that found only one international trial in which family doctors were the sole practitioner in the intervention (Martin et al. 2006). This broader review aims to determine if this was because randomised controlled trials are not being used to assess the role of the family doctor as a sole practitioner in obesity, or if family doctors as sole practitioners are not being used in interventions for adults with obesity at all. Once the international literature has been evaluated in this scoping review, we will then translate the evidence found for the Australian primary care context.

Current obesity management guidelines strongly recommend the referral of patients to a multidisciplinary team that may include a dietician, exercise physiologist, psychologist, physiotherapist or others depending on the needs of the patient (National Health and Medical Research Council 2013). In some circumstances this multidisciplinary care is not available (e.g. in rural and remote areas), is out of cost range for the patient (Pearce-Brown et al. 2011), involves a long waiting list or is declined by the patient (Tan et al. 2006).

Every health professional should have a clear understanding of their role in the management of adults who are overweight or obese. Helping family doctors to understand what the evidence is for their role allows more open and accurate discussions with patients around possible management options. If the best option according to current guidelines is not available to the patient for whatever reason, the family doctor and patient can then make an evidence based plan for alternative management.

Primary care is defined as that which is accessible as a first entry point into the healthcare system, provides co-ordinated, whole person and longitudinal care that is person-centred (Reeve et al. 2013; van Weel 2014). Person-centredness is defined as the treatment of a patient taking into account their physical health, mental health and social situation. What the patient values and desires for their health remains central to any defined treatment or management process (Reeve et al. 2013).

Family doctors are known by different terms throughout the world including general practitioners (UK, Australia and New Zealand), primary care physician (USA and Canada), family physician or family doctor (USA). They are medical doctors who are trained to have expert generalist skills in patient management ("expert generalist"). In most countries they require extra training above their basic medical degree. The defining feature of an expert generalist is their ability to provide whole-person care and to do this in the context of person-centredness. This translates to being a doctor that can manage all disease and health concerns no matter what body system is affected and being able to do this taking into account the wishes and values of the person at the centre of the management plan (Reeve et al. 2013).

Current systematic reviews of obesity management in adults in primary care do not determine the impact of the different health professionals involved in the intervention (Reeve et al. 2013; Tsai and Wadden 2009; Flodgren et al. 2010). This is important for three reasons:

1. The magnitude of effect of the role of any particular health professional has not been determined
2. As family doctors we cannot assess what specific role we may play if multidisciplinary management is not possible
3. The generalist expertise of the family doctor is not captured and we lose any insight into the effectiveness of this non-fragmented care.

This broad scoping review allows us to synthesise and map the current evidence base for the involvement of the family doctor in obesity management and therefore identify any gaps.

It is well known that existing interventions do not lead to sustained weight loss in the majority of individuals (Fildes et al. 2015). In fact less than 1 % of obese individuals were found to return to normal weight in a cohort study from the UK (Fildes et al. 2015). For policy makers who are involved in decisions related to obesity management in primary care it is important to fully understand the current evidence base for interventions. By broadening our knowledge on the way interventions are currently working we can try to find the "missing link" that may make future interventions more successful.

Our scoping review questions are:

- What supporting evidence do we have for role family doctors play in obesity management for adults in primary care?
- What is the role of the family doctor in managing obesity as a primary risk as supported by the evidence base?
- What do primary care guidelines say about the role of the family doctor? What do peak bodies say about the role of the family doctor? Are these both in line with what is conveyed by current research?

We have searched for similar scoping reviews looking specifically at the role of the family doctor in managing adults who are overweight or obese and none exist to our

knowledge (databases searched JBISRIR, Cochrane Database of Systematic Reviews, CINAHL, PubMed, EPPI). A realist review protocol has been published that will review how doctors identify and refer patients who are obese (Blane et al. 2015) but our review will use a different methodology and focus on the role of the family doctor in the management process.

Methods

Inclusion criteria

Types of participants

This scoping review will consider any manuscripts that discuss the provision of primary health care for adults (18 years +) who have a BMI of greater than 25 (overweight or obese).

Concept

Any manuscripts that involve the family doctor in obesity management will be considered including any interventions or discussions of their role. In an intervention trial all stages of family doctor involvement will be accepted whether that be in the recruitment phase, the intervention itself or as a control. This will be regardless of whether or not other health professionals or lay people are involved.

Context

This scoping review will consider manuscripts that involve a primary care setting whether in the recruitment phase or during the intervention phase.

Types of sources

All sources of information will be included including studies published in peer-reviewed publication (black literature) and non-peer-reviewed (grey) literature. In the grey literature we will search specifically for international guidelines and announcements from peak bodies.

Exclusion criteria

- Complete text in languages other than English (translated abstracts will be assessed)
- Exclude studies of children (under the age of 18 years) and family interventions where the primary target of the intervention is the child
- Exclude if participants recruited/treated only in a tertiary facility
- No publication date exclusion; no type of manuscript excluded.

Search strategy

Our search strategy will involve three steps as described by the Joanna Briggs Institute methodology for scoping reviews (The Joanna Briggs Institute 2015).

1. An initial limited search of two databases (Medline, CINAHL) with "[(obesity) and doctor] and primary care" will be performed.
   a. We will analyse the text words in title, abstract and index terms of relevant studies found to compile a list of relevant search terms.
2. Then using all identified keywords and index terms we will search across all of the following databases:
   a. Medline, CINAHL, Cochrane, PsycInfo, DARE, Scopus
   b. New York Academy of Medicine Grey Literature Report, Open Grey
   c. International guidelines for primary care via the World Organisation of National Colleges, Academies and Academics Associations of General Practitioners and via national primary care colleges' websites (English and non-English speaking—Australia, UK, USA, New Zealand, The Netherlands, Denmark, Finland, Estonia, Slovenia, Belgium, Spain and Portugal).
3. Finally we will search the reference lists of all identified material to identify further material of relevance.

   We will contact authors of primary studies or reviews for further information as appropriate.

Lists of articles will managed with reference software and duplications will be removed. The title, abstracts and keywords of all articles will then be reviewed by two independent reviewers (LS, NE) to determine whether they meet our inclusion criteria. In cases of uncertainty the entire article will be reviewed and in cases of disagreement a third author (KD) will be consulted.

We will then review the full publication for any articles that meet our inclusion criteria.

Assessment of methodological quality

A formal assessment of methodological quality is not a typical feature of a scoping review. No formal assessment of quality will be included in our scoping review.

Extraction of the results

Data will be extracted using a customised data extraction form based on the TIDieR framework (Hoffmann et al. 2014) that will trialled between the two reviewers prior to full data extraction. The data extraction will be modified as needed for different manuscript types (e.g. research, opinion, guidelines). The two reviewers will then extract the data independently with any conflict being resolved with discussion with a third reviewer. The data extraction form will contain the following information:

1. Author
2. Year of publication
3. Country of origin
4. Aim of the research as described by the authors
5. Population and sample size, including any co-morbidities
6. Methodology
7. Intervention/comparator (if applicable)
8. Duration of intervention (if applicable)
9. Outcomes and how these were measured
10. Key findings as applicable to this scoping review:
    a. In what way was primary care involved (recruitment/intervention/control/other)?
    b. How was a doctor involved? (recruitment/intervention/control/other)?
    c. What skills were required of the family doctor? (identification/nutrition/physical activity/behavioural intervention/medication/other)
    d. Did the intervention meet the definition of primary care:
        i. first point of entry? (the patient could access this service without a specific referral)
        ii. whole person case? (is the health of the person as whole considered?)
        iii. person centred care? (are the values and beliefs of the patient taken into account in the context of their physical, mental and spiritual health?)
        iv. longitudinal? (is this delivered in a fashion that could be continuous, or intersect with continuous care?).

As is customary with scoping reviews, the data extraction template will be reviewed as necessary as the data extraction proceeds. This will be determined during weekly meetings of the two reviewers.

Presentation of the results

The results of our search strategy will be presented as a PRISMA flow diagram as per convention. The data extraction will be presented as a table with the following headings which may be refined as the scoping review proceeds: Year, Country, Aim(s), Methodology, Intervention, Family Doctor's Role.

A narrative synthesis of the included studies will allow for direct discussion of the scoping review objectives. We will identify any gaps in the literature and discuss any implications for practice or future research.

Consultation

Our results will be presented to local Australian stakeholders to assess whether the findings resonate with what they know and experience of primary care weight management programs. This will be done via a public forum where the results will be presented and a discussion panel involving our research team will be conducted. Stakeholders who will be specifically invited will include local GPs and primary care nurses, academic GPs, policy makers and tertiary weight management clinicians. After the forum an opportunity to give direct feedback to the research team via email will be given. This will also facilitate knowledge exchange between clinicians and policy makers in the area of obesity in primary care.

Authors' contributions

GS suggested using the scoping methodology. ES, GS, CVW, KD designed the processes within the methodology. AS, EH, NE, MH provided corrections and improvements for the methodology. ES drafted the manuscript. All authors critically revised the manuscript providing feedback and revising the content. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

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References

Bennett WL et al (2015) Satisfaction with primary care provider involvement is associated with greater weight loss: results from the practice-based POWER trial. Patient Educ Couns 98(9):1099–1105

Blane DN et al (2015) Interventions targeted at primary care practitioners to improve the identification and referral of patients with co-morbid obesity: a realist review protocol. Syst Rev 4:61

Fildes A et al (2015) Probability of an obese person attaining normal body weight: cohort study using electronic health records. Am J Public Health 105(9):e54–e59

Flodgren G et al (2010) Interventions to change the behaviour of health professionals and the organisation of care to promote weight reduction in overweight and obese adults. Cochrane Database Syst Rev. doi:10.1002/14651858.CD000984.pub2

Hoffmann TC et al (2014) Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. BMJ 348:g1687

Jansen S et al (2015) Obesity management by general practitioners: the unavoidable necessity. Aust J Prim Health 21(4):366–368

Martin P et al (2006) A primary care weight management intervention for low-income African-American women. Obesity 14(8):1412–1420

National Health and Medical Research Council (2013) Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia. National Health and Medical Research Council, Melbourne

Pearce-Brown CL et al (2011) A local study of costs for private allied health in Australian primary health care: variability and policy implications. Aust J Prim Health 17:131–134

Reeve J et al (2013a) Generalist solutions to complex problems: generating practice-based evidence–the example of managing multi-morbidity. BMC Fam Pract 14:112

Reeve J et al (2013b) Examining the practice of generalist expertise: a qualitative study identifying constraints and solutions. JRSM Short Rep 4(12):2042533313510155

Tan D et al (2006) Weight management in general practice: what do patients want? Med J Aust 185(2):73–76

The Joanna Briggs Institute (2015) Methodology for JBI scoping reviews, in Joanna Briggs Institute Reviewer's Manual: 2015, 6th edn. The Joanna Briggs Institute, Adelaide

Tsai AG, Wadden TA (2009) Treatment of obesity in primary care practice in the United States: a systematic review. J Gen Intern Med 24(9):1073–1079

Valenti L (2009) Overweight and obesity. In: Britt H, Miller G (eds) General practice activity in Australia, priorities and policies 1998 to 2008. AIHW, Canberra

van Weel C (2014) Primary health care and family medicine at the core of health care: challenges and priorities in how to further strengthen their potential. Front Med 1(October):1–5

Chapter 2a)

ii) The role of the family doctor in the management of adults with obesity: a scoping review.

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Role of the family doctor in the management of adults with obesity: a scoping review

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ABSTRACT

Objectives Obesity management is an important issue for the international primary care community. This scoping review examines the literature describing the role of the family doctor in managing adults with obesity. The methods were prospectively published and followed Joanna Briggs Institute methodology.

Setting Primary care. Adult patients.

Included papers Peer-reviewed and grey literature with the keywords obesity, primary care and family doctors. All literature published up to September 2015. 3294 non-duplicate papers were identified and 225 articles included after full-text review.

Primary and secondary outcome measures Data were extracted on the family doctors' involvement in different aspects of management, and whether whole person and person-centred care were explicitly mentioned.

Results 110 papers described interventions in primary care and family doctors were always involved in diagnosing obesity and often in recruitment of participants. A clear description of the provider involved in an intervention was often lacking. It was difficult to determine if interventions took account of whole person and person-centredness. Most opinion papers and clinical overviews described an extensive role for the family doctor in management; in contrast, research on current practices depicted obesity as undermanaged by family doctors. International guidelines varied in their description of the role of the family doctor with a more extensive role suggested by guidelines from family medicine organisations.

Conclusions There is a disconnect between how family doctors are involved in primary care interventions, the message in clinical overviews and opinion papers, and observed current practice of family doctors. The role of family doctors in international guidelines for obesity may reflect the strength of primary care in the originating health system. Reporting of primary care interventions could be improved by enhanced descriptions of the providers involved and explanation of how the pillars of primary care are used in intervention development.

Strengths and limitations of this study

- ► The protocol for this scoping review was prospectively published and was based onthe Joanna Briggs Institute (JBI) scoping review methodology.
- ► All types of articles have been included in this scoping review including international guidelines from relevant family medicine colleges.
- ► Feedback was obtained from three groups of interested clinical and academic colleagues in Australia and internationally as per the JBI methodology for a scoping review.
- ► Articles in languages other than English were excluded from the review and therefore the results are not representative of non-English-speaking countries.

INTRODUCTION

Obesity is recognised as a risk factor for the development of chronic disease and is often comorbid with diseases such as diabetes, osteoarthritis, cardiovascular disease and depression.[1] As such, obesity is a condition that is commonly associated with a larger set of health issues encountered by an individual. As in all cases of multimorbidity, a person's care will benefit from the coordinated and continuous care offered by an interdisciplinary team in primary care.[2 3] By exploring the role of the family doctor, we are not questioning the importance of team-based care. Instead, we aim to explore how family doctors are represented in the broad literature to further understand the profession's role. This understanding is important when interdisciplinary teams are not accessible (eg, rural location), affordable (eg, health insurance differentials) or part of the patient's preference for care.[4–6] Thus, the literature that focuses on the management of adults with obesity by the family doctor is important to understand.

With the rising numbers of adults living with obesity and related chronic diseases, there is an increasing demand from health systems for primary care, and family doctors in particular, to identify and manage this as a chronic condition.[6] With this changing landscape, it was anticipated that the academic literature would explore the effectiveness of primary

care, as well as the involvement of different practitioners in obesity management. However, our initial explorations into this literature found a lack of clarity in this area. A scoping review was chosen to explore emerging patterns, and gaps, in the literature based on the role of the family doctor in managing adults with obesity.

The term used to describe a family doctor varies internationally, and includes general practitioner and family physician. The term 'primary care physician', which stems from the USA, includes paediatricians, obstetricians and internists. In this review, we define 'family doctor' as a physician with specialist training in primary care who practises in the community, as an expert generalist.

Different practitioners will bring varying strengths and limitations to any intervention and it is important for family doctors to understand what skills they offer in the setting of obesity management. The importance of understanding provider role is demonstrated in the methodology of critical realism where realist evaluation acknowledges the importance of context of any intervention.[7] Translating rigorous scientific trials into policy and practice is challenging and realist evaluation is an increasingly used tool to inform effective translation of evidence.[8] Part of understanding context in the realist evaluation is knowing the type of provider, and their experience level, in delivering an intervention. This scoping review provides an overview of the role of the family doctor in interventions, clinical overviews and opinions, observed practice and clinical guidelines.

The pillars of primary care—being the first point of health system entry, delivering continuous, whole person (ie, concerned with every body system and the mind) and person-centred care (ie, elucidates comorbidities, social circumstances, and maintains the beliefs and values of the person at the heart of management for all health problems in all patients in all stages)—are well established.[9] Other tiers of the health system may provide some, but not all, of the four pillars. Each of these concepts needs to be present in the management of a patient to gain the full benefits of primary care.[10] Patient management that is not based around these four pillars is unlikely to reap the benefits of coordinated, comprehensive, expert generalist care.[11–13]

This scoping review aims to examine and map the current research base, and broader literature, for the role of the family doctor in managing adults with obesity.

The objectives, inclusion criteria and methods of analysis for this review were specified in advance and documented in a protocol.[14] The scoping review questions we aimed to answer were:

1. What supporting evidence (both primary and secondary) do we have for the role family doctors play in obesity management for adults in primary care?
2. What is the role of the family doctor in managing obesity as a primary risk as supported by the evidence base?
3. What do primary care guidelines say about the role of the family doctor? What do peak bodies (ie, advocacy group) say about the role of the family doctor? Are these both in line with what is conveyed by current research?

METHODS

The complete methods were prospectively published in a protocol.[14] Our search strategy included all literature published until September 2015. A preliminary search for existing scoping reviews did not find any with the same concept and topic (databases searched JBISRIR, Cochrane Database of Systematic Reviews, CINAHL, PubMed, EPPI). Manuscripts were included when they involved adults (18+ years) with a body mass index (BMI) of greater than 25 (overweight or obesity), any involvement of a primary care doctor/physician, a primary care setting and inclusion of obesity management (online supplementary file 1). Contrary to our outlined protocol, we excluded papers in languages other than English, including those with an English abstract, as we could not perform data extraction adequately on these papers. In addition to this search strategy, we specifically sought relevant clinical guidelines from countries with strong involvement in the World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians (Australia, UK, USA, New Zealand, the Netherlands, Denmark, Finland, Estonia, Slovenia, Belgium, Spain and Portugal). We explored the family medicine college web sites from these countries and contacted the colleges via email when guidelines were not accessible.

This scoping review was purposefully restricted to obesity management of adults in primary care. As suggested in the Joanna Briggs Institute methodology, the scope has to take account of feasibility while maintaining a broad and comprehensive approach. By restricting the scoping review to obesity, we were able to extract more detail about the family doctor's role than if we had included articles with a main focus on a specific non-communicable disease (eg, diabetes, heart disease). For this same reason, we did not include articles that were only describing nutrition care or physical activity advice unless they were specifically in relation to care of a patient with obesity. Due to the differences in the management of obesity in children and adolescents these population groups were not included in this review.

Two reviewers (EAS, NE) independently reviewed the abstracts, followed by the full papers, as described in the flow chart (figure 1). Our data extraction tool captured the author, country of intervention, year of publication, aim, term used to describe the primary care practitioner, methodology, type of involvement of the primary care doctor, skills needed by the doctor and whether the pillars of primary care were identified. Whole person care was judged as included if the paper described obesity management provided in the context of other health needs. Person-centredness was considered as incorporated when

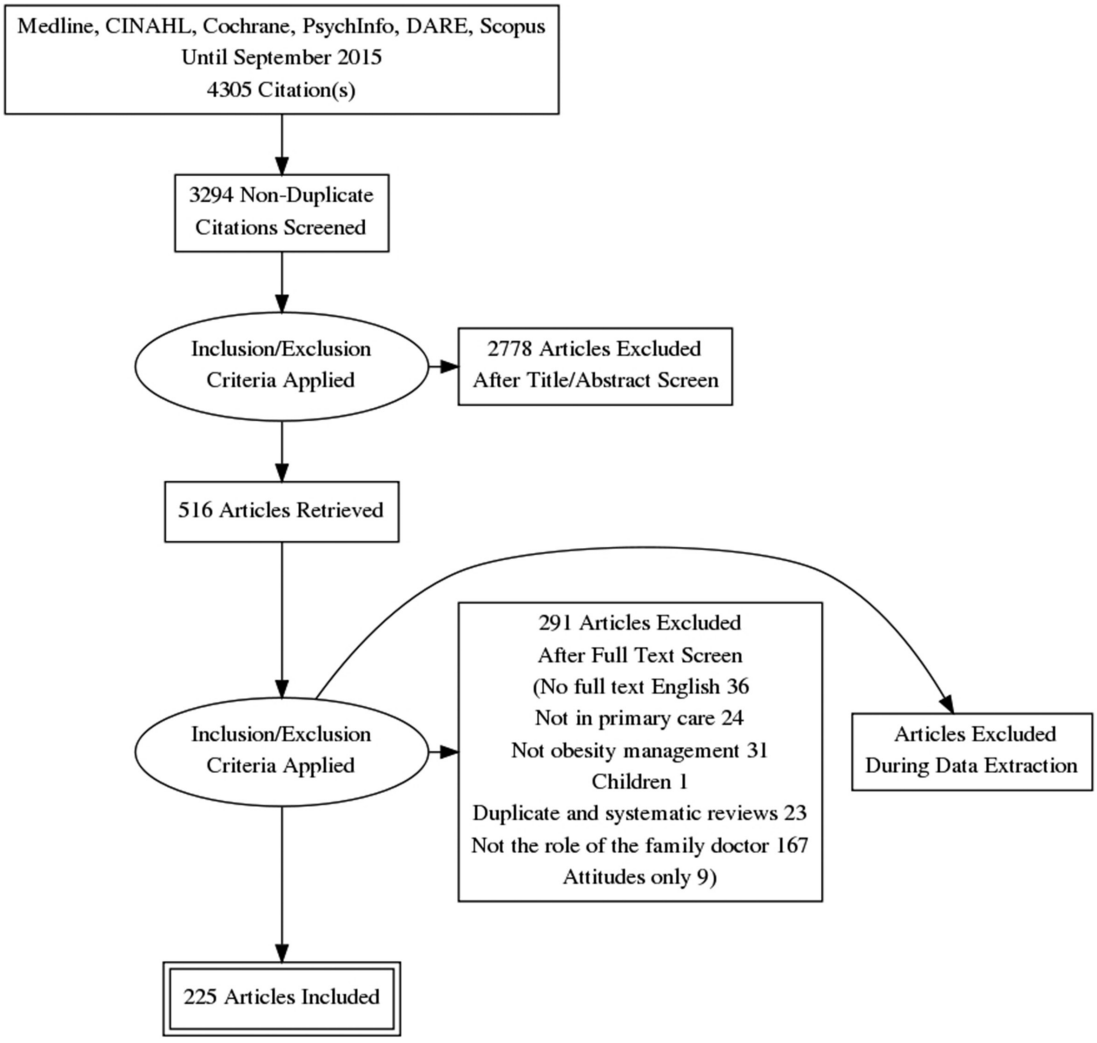

Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram for scoping review of the role of family doctors in obesity management.

the patient's values, beliefs, cultural needs or context of their community were discussed. First point of contact with the health system was part of all the interventions as 'primary care' was part of the search term. Elements of continuity of care were captured with data extracted about communication between any other types of providers and the family doctor. We did not complete a thematic analysis of the included papers.

We iteratively developed the data extraction tool based on the information we found in a first pass of all of the intervention papers. The role of the family doctor was extracted in line with clinical management processes in a primary care setting starting with anthropometric measurements, diagnosis, referrals, nutrition care, physical activity advice, as well as more intensive treatments such as medications and bariatric surgery. For the intervention articles, data specific to clinical trials were extracted such as recruitment and control or intervention involvement. A third reviewer (EH) reviewed the extraction data sheets and recommended additional details to be added and reviewed the guideline extraction in full.

Our scoping review of interventions involving family doctors in the management of obesity drew on the Template for Intervention Description and Replication (TIDieR) guidelines for the description of interventions.[15] These guidelines outline the parts of interventions that need to be described in order for other practitioners to replicate the intervention, either for research or clinical practice. TIDieR was developed to standardise intervention description and support their implementation, which has been an undervalued aspect of health research.[15]

Results were presented to stakeholders including patients, clinicians, primary health network representatives, chronic disease organisations and academics at three sessions (April 2015 preliminary results presented during a seminar in Canberra; March 2016 results presented to international academic audience in the Netherlands; June 2017 results presented at an academic meeting of clinicians and academics). The input from

Table 1 Number of different interventions identified in scoping review that describe a role for the family doctor in primary care obesity management—by country where the intervention was undertaken, and study design

Country of intervention		Study design	
Australia	2	RCT	40
Canada	5	Single-arm trial	21
Denmark	1	Cohort	7
Germany	3	Non-randomised two-arm trial	2
Israel	2	Cost-effectiveness	2
Italy	1	Action research (protocol)	1
Japan	1	Case–control	1
Netherlands	3	Clinical audit	1
New Zealand	2	Cross sectional	1
Scotland	1	Educational intervention	1
Spain	1		
Switzerland	4		
UK	5		
UK/Australia/Germany	1		
UK/Scotland	1		
USA	44		
Total	77	*Total*	77

RCT, randomised controlled trial.

these meetings was used to debate the justification for the review, the interpretation of the data extraction and the synthesis of the findings.

RESULTS

This scoping review uncovered 3294 non-duplicate citations, and after title and abstract screening 516 articles were reviewed in full. Up to 291 articles were excluded on full review for the reasons shown in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram (figure 1). A total of 225 articles were included in the final review. The inter-rater agreement for the data extraction points exceeded 95% (62 points of disagreement out of 4992 data extraction points).

Using the focus of the three scoping questions, the following is a description of the literature that was reviewed.

What supporting evidence (both primary and secondary) do we have for role family doctors play in obesity management for adults in primary care?

Of the 225 articles that were included in the review, 110 were about interventions in primary care. There were 77 different interventions described in these papers as some intervention were portrayed in multiple papers (tables 1 and 2). Fifty-seven per cent (44/77) of the interventions were carried out in the USA, with the remainder taking place in a variety of countries (table 1). Forty-eight per cent (37/77) of the interventions described were randomised controlled trials (RCT) (table 1). A majority of interventions on the management of adults with obesity stem from the USA, and RCTs are a common study design.

There were a total of 74 articles that were clinical overviews and opinion papers on the primary care management of obesity that included discussion of the role of the family doctor (table 3), and 25 papers that described current practice of family doctors in obesity management, usually through surveys or clinical audits (table 4). There were 16 international guidelines relevant to family doctors focused on the management of obesity (table 5).

What is the role of the family doctor in managing obesity as a primary risk as supported by the evidence base?

The family doctor was involved in varying ways in obesity management depending on the type of article. The most common role for the family doctor across all types of articles was the diagnosis of obesity. The diagnosis was based on the BMI of the patient and waist circumference measurements were rarely taken. Family doctors were not often involved in intervention studies beyond diagnosis and referral into the trial. Papers about current practice, including audits and surveys, mentioned a lack of recognition and treatment of obesity by family doctors. Current overview and opinion papers often suggested a wide role including diagnosis, nutrition and physical activity counselling, and options for appropriate referrals. And there was great variation in the international guidelines with the family doctor not mentioned by some, to a broad role in others. Unsurprisingly, this varied depending on whether a primary care organisation had developed the guideline.

In all types of articles, the family doctor was frequently involved in the diagnosis of obesity (73/110 intervention papers, 69/74 overview papers, 22/24 current practice papers). They were involved in height and weight measurements in 111 out of 225 total papers, and overall waist circumference was infrequently mentioned in all articles (50/209 papers, not including guidelines).

We included all interventions relevant to the review, whether they were reported the family doctor's role as part of an experimental intervention or in a control arm (table 2). In 45 of the 77 interventions, the family doctor was involved in recruiting patients to the trial. The family doctor only had a role in care delivery in 27 interventions (35%) in either the intervention or the control arm of a trial. Across all interventions, 'standard care' was used in 27 trials; however, it was only well described in 12 of these. In one case, the 'primary care provider' was used in the standard care arm but was 'instructed not to provide specific behavioral strategies for changing eating and activity habits'.[16]

We attempted to describe whether the pillars of primary care could be identified in the interventions as they were described. In 17 of the 77 interventions, the comprehensive, holistic care of the patient was described. In only

Table 2 Interventions in primary care in the management of adult obesity involving the general practitioner (over seven pages)

Author	Multiple[21 22]	Multiple[23–29]	Bolognesi *et al*[30]	Bodenlos[31]	Kerr *et al*[32]	Multiple[33–35]	Multiple[36–39]	Multiple[16 40–46]	Tsai *et al*[47]	Banerjee *et al*[48]	Blonstein *et al*[49]	Barnes *et al*[50]
Name of intervention	Meal replacements in weight	Counterweight	PACE	NA	NA	Be Fit Be Well	POWER	POWER-UP	NA	NA	NA	NA
Number of papers	2	7	1	1	1	3	4	8	1	1	1	1
Country	USA	UK/Scotland	Italy	USA	USA	USA	USA	USA	USA	USA	USA	USA
Year	2001	2004–2012	2006	2007	2008	2009–2013	2009–2015	2009–2015	2010	2013	2013	2015
Design	RCT	Cohort/single arm	RCT	RCT	RCT	RCT	RCT/cohort	RCT	RCT	RCT	Single-arm trial	Single-arm trial
Diagnosis		X	X				X	X	X		X	X
Recruitment into the trial	X	X					X	X	X		X	
Coordination						X	X	X			X	
Weight and height		X	X						X			
Waist circumference			X									
System level/implementation												
Doctor–patient relationship			X	X			X					
Public health role												
Prevention												
Nutrition education	X			X				X	X			
Physical activity education	X		X	X				X	X			
Behaviour modification	X		X	X								
Counselling/psychology			X									
Role modelling												
Group-based interventions				90								
Medications								X				
Bariatric surgery referral												
Bariatric surgery work-up												
Bariatric surgery after care												
Commercial weight loss programme referral												
Bariatric equipment in consultation room												
Standard care undefined												
Standard care was used			X		X	X	X	X		X		
Exact role uncertain										X		
Person-centredness			X	X								
Whole person care			X	X			X	X				

Author	Booth *et al*[51]	Bordowitz *et al*[52]	Bowerman *et al*[53]	Clark *et al*[54 55]	Coupar *et al*[56]	Cutler *et al*[57]	Doering *et al*[58]	Dutton *et al*[59]	Eichler *et al*[60]
Name of intervention	NA	NA	NA	Primary care weight management program	NA	NA	NA	NA	NA
Number of papers	1	1	1	2	1	1	1	1	1

Continued

Table 2 Continued

Author	Booth *et al*[51]	Bordowitz *et al*[52]	Bowerman *et al*[53]	Clark *et al*[54 55]	Coupar *et al*[56]	Cutler *et al*[57]	Doering *et al*[58]	Dutton *et al*[59]	Eichler *et al*[60]
Country	Australia	USA	USA	USA	Scotland	New Zealand	USA	USA	Switzerland
Year	2006	2007	2001	2008–2010	1980	2010	2013	2015	2007
Design	Single-arm trial	Cross sectional	Single-arm trial	Single-arm trial	Single-arm trial	Single-arm trial	Single-arm trial	Single-arm trial	Single-arm trial
Diagnosis	X	X	X	X	X			X	X
Recruitment into the trial		X	X	X	X	X		X	X
Coordination		X	X		X				
Weight and height	X		X		X				X
Waist circumference	X								
System level/implementation									
Doctor–patient relationship									X
Public health role									
Prevention	X								
Nutrition education	X	X			X				X
Physical activity education	X	X							
Behaviour modification	X	X							X
Counselling/psychology		X							X
Role modelling					X				
Group-based interventions					X				X
Medications			X						
Bariatric surgery referral									
Bariatric surgery work-up									
Bariatric surgery after care									
Commercial weight loss programme referral									
Bariatric equipment in consultation room									
Standard care undefined									
Standard care was used									
Exact role uncertain									
Person-centredness	X								
Whole person care	X	X							

Author	Ely *et al*[61]	Feigenbaum *et al*[62]	Kanke *et al*[63]	Multiple[64–66]	Huerta *et al*[67]	Garies *et al*[68]	Gusi *et al*[69]	Haas *et al*[70]	Multiple[71–73]	Hauner *et al*[74]	Hoke and Franks[75]
Name of intervention	NA	NA	NA	Commercial weight loss referral	NA	NA	NA	NA	Lighten-Up	NA	NA
Number of papers	1	1	1	3	1	1	1	1	3	1	1
Country	USA	Israel	Japan	UK/Australia/ Germany	USA	Canada	Spain	USA	UK	Germany	USA
Year	2008	2005	2015	2011–2014	2004	2015	2008	2012	2010–2012	2004	2002
Design	RCT	Two-arm trial, non-randomised	RCT	RCT	Cohort	Cohort	RCT	Cohort	RCT	RCT	Single-arm trial

Continued

Table 2 Continued

Author	Ely *et al*[61]	Feigenbaum *et al*[62]	Kanke *et al*[63]	Multiple[64–66]	Huerta *et al*[67]	Garies *et al*[68]	Gusi *et al*[69]	Haas *et al*[70]	Multiple[71–73]	Hauner *et al*[74]	Hoke and Franks[75]
Diagnosis	X			X	X	X	X	X	X	X	X
Recruitment into the trial	X	X		X	X	X	X	X	X	X	X
Coordination	X	X			X						
Weight and height	X	X		X	X	X	X	X		X	
Waist circumference				X						X	
System level/implementation											
Doctor–patient relationship	X		X			X					
Public health role											
Prevention											
Nutrition education		X	X	X		X		X			
Physical activity education			X	X		X		X			
Behaviour modification		X						X			
Counselling/psychology								X			
Role modelling											
Group-based interventions											
Medications		X								X	
Bariatric surgery referral											
Bariatric surgery work-up											
Bariatric surgery after care											
Commercial weight loss programme referral				X							
Bariatric equipment in consultation room											
Standard care undefined											
Standard care was used	X		X	X			X				
Exact role uncertain											
Person-centredness											
Whole person care			X								

Author	Kumanyika *et al*[76 77]	Kuppersmith and Miles[78]	Laing *et al*[79]	Lewis *et al*[80]	Logue *et al*[81 82]	Logue *et al*[83]	Lowe *et al*[84]	Madigan *et al*[85]	Martin *et al*[86 87]	McDoniel *et al*[88 89]	Mehring *et al*[90]
Name of intervention	Think Health	NA	NA	NA	Transtheoretical Model-Chronic Disease Care for Obesity in Primary Care	NA	NA	NA	A Primary Care Weight Management Intervention for Low-Income African-American Women	The SMART motivational trial	NA
Number of papers	2	1	1	1	2	1	1	1	2	2	1
Country	USA	USA	USA	UK	USA	USA	USA	UK	USA	USA	Germany
Year	2011–2012	2006	2014	2013	2000–2005	2012	2014	2014	2006–2008	2009–2010	2013
Design	RCT	Single-arm trial	RCT	RCT	RCT	RCT	RCT	RCT	RCT	Single-arm trial	RCT
Diagnosis	X				X		X	X		X	X

Continued

Table 2 Continued

Author	Kumanyika *et al*[76 77]	Kuppersmith and Miles[78]	Laing *et al*[79]	Lewis *et al*[80]	Logue *et al*[81 82]	Logue *et al*[83]	Lowe *et al*[84]	Madigan *et al*[85]	Martin *et al*[86 87]	McDoniel *et al*[88 89]	Mehring *et al*[90]
Recruitment into the trial	X				X	X	X	X	X	X	X
Coordination		X			X					X	X
Weight and height									X	X	X
Waist circumference											X
System level/implementation											
Doctor–patient relationship									X	X	X
Public health role											
Prevention											
Nutrition education	X	X							X		
Physical activity education	X								X		
Behaviour modification	X								X		X
Counselling/psychology	X								X		X
Role modelling											
Group-based interventions											
Medications		X									
Bariatric surgery referral		X									
Bariatric surgery work-up											
Bariatric surgery after care											
Commercial weight loss programme referral				X							
Bariatric equipment in consultation room											
Standard care undefined		X	X						X		X
Standard care was used		X	X					X	X		X
Exact role uncertain											
Person-centredness					X				X		X
Whole person care		X			X				X		X

Author	Munsch *et al*[91]	O'Grady *et al*[92]	Olsen *et al*[93]	Pellegrini *et al*[94]	Richman *et al*[95]	Ross *et al*[96 97]	Rutten *et al*[98]	Saris *et al*[99]	Stephens *et al*[100]	Multiple[101–105]	Thomas *et al*[106]	Toth-Capelli *et al*[107]
Name of intervention	NA	NA	NA	NA	NA	PROACTIVE	NA	NA	NA	Groningen Overweight	NA	NA
Number of papers	1	1	1	1	1	2	1	1	1	5	1	1
Country	Switzerland	USA	Denmark	USA	Australia	Canada	Netherlands	Netherlands	USA	Netherlands	USA	USA
Year	2003	2013	2005	2014	1996	2009–2012	2014	1992	2008	2009–2012	2015	2013
Design	RCT	Clinical audit	Cost-effectiveness	RCT	Case–control	RCT	Cohort	Single-arm trial	Cohort	Single-arm trial, RCT	RCT	Single-arm trial
Diagnosis			X		X	X	X	X			X	X
Recruitment into the trial			X		X	X	X	X			X	X
Coordination	X				X			X			X	

Continued

Table 2 Continued

Author	Munsch *et al*[91]	O'Grady *et al*[92]	Olsen *et al*[93]	Pellegrini *et al*[94]	Richman *et al*[95]	Ross *et al*[96 97]	Rutten *et al*[98]	Saris *et al*[99]	Stephens *et al*[100]	Multiple[101–105]	Thomas *et al*[106]	Toth-Capelli *et al*[107]
Weight and height	X	X	X		X			X			X	
Waist circumference			X		X							
System level/implementation												
Doctor–patient relationship					X						X	
Public health role												
Prevention												
Nutrition education	X		X		X							
Physical activity education	X				X							
Behaviour modification	X				X							
Counselling/psychology	X											
Role modelling												
Group-based interventions	X											
Medications												
Bariatric surgery referral												
Bariatric surgery work-up												
Bariatric surgery after care												
Commercial weight loss programme referral												
Bariatric equipment in consultation room												
Standard care undefined	X	X				X			X	X		
Standard care used	X	X				X			X	X		
Exact role uncertain				X								
Person-centredness					X							
Whole person care		X			X						X	

Author	Tsai *et al*[108]	Wadden *et al*[109]	Wilson *et al*[110]	Wirth[111]	Yardley *et al*[112]	Tsai *et al*[113]	Ryan *et al*[114]	Baillargeon *et al*[115]	Baillargeon *et al*[116]	Katz *et al*[117]	Buclin-Thiébaud *et al*[118]	Feuerstein *et al*[119]
Name of intervention	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Number of papers	1	1	1	1	1	1	1	1	1	1	1	1
Country	USA	USA	USA	Germany	UK	USA	USA	Canada	Canada	Israel	Switzerland	USA
Year	2012	2005	2010	2005	2014	2015	2010	2007	2014	2005	2010	2015
Design	Cost-effectiveness	RCT	Non-randomised two-arm trial	Single-arm trial	RCT	RCT	RCT	Action research (protocol)	RCT (protocol)	Educational intervention	Single-arm trial	Single-arm trial
Diagnosis			X	X			X			X		X
Recruitment into the trial		X	X	X			X					
Coordination			X	X			X		X	X		
Weight and height			X	X			X		X			X
Waist circumference							X		X			
System level/implementation												

Continued

Table 2 Continued

Author	Tsai *et al*[108]	Wadden *et al*[109]	Wilson *et al*[110]	Wirth[111]	Yardley *et al*[112]	Tsai *et al*[113]	Ryan *et al*[114]	Baillargeon *et al*[115]	Baillargeon *et al*[116]	Katz *et al*[117]	Buclin-Thiébaud *et al*[118]	Feuerstein *et al*[119]
Doctor–patient relationship												
Public health role												
Prevention												
Nutrition education				X			X		X	X		X
Physical activity education				X					X	X		
Behaviour modification				X					X	X		
Counselling/psychology												
Role modelling												
Group-based interventions				X								
Medications				X			X			X		
Bariatric surgery referral										X		
Bariatric surgery work-up												
Bariatric surgery after care												
Commercial weight loss programme referral												
Bariatric equipment in consultation room												
Standard care undefined			X		X							
Standard care was used			X		X		X					
Exact role uncertain								X			X	
Person-centredness												
Whole person care				X					X			X

Author	Hartman *et al*[120]	Lin *et al*[121]	Moore *et al*[122]	Rodondi *et al*[123]	Rueda-Clausen *et al*[124]	Schuster *et al*[125]	Yank *et al*[126]	Goodyear-Smith *et al*[127]	Jay *et al*[128]	Wadden *et al*[129]
Name of intervention	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Number of papers	1	1	1	1	1	1	1	1	1	1
Country	USA	USA	UK	Switzerland	Canada	USA	USA	New Zealand	USA	USA
Year	2014	2015	2003	2006	2014	2008	2013	2014	2013	1997
Design	RCT (protocol)	RCT	RCT	Cohort study	Single-arm trial	Single-arm trial	RCT	RCT	RCT	RCT
Diagnosis	X		X	X		X		X	X	X
Recruitment into the trial	X							X		X
Coordination	X				X	X			X	
Weight and height	X			X		X		X	X	
Waist circumference	X									
System level/implementation						X				
Doctor–patient relationship				X	X					
Public health role						X				
Prevention										

Continued

Table 2 Continued

Author	Hartman *et al*[120]	Lin *et al*[121]	Moore *et al*[122]	Rodondi *et al*[123]	Rueda-Clausen *et al*[124]	Schuster *et al*[125]	Yank *et al*[126]	Goodyear-Smith *et al*[127]	Jay *et al*[128]	Wadden *et al*[129]
Nutrition education			X	X		X			X	
Physical activity education			X	X		X			X	
Behaviour modification			X	X		X			X	
Counselling/psychology										
Role modelling										
Group-based interventions										
Medications										
Bariatric surgery referral										
Bariatric surgery work-up										
Bariatric surgery after care										
Commercial weight loss programme referral										
Bariatric equipment in consultation room										
Standard care undefined			X		X		X	X		
Standard care was used			X		X		X	X		
Exact role uncertain			X		X					
Person-centredness										
Whole person care										

NA, not applicable; RCT, randomised controlled trial.

Table 3 Clinical overviews and opinion articles on the role of the family doctor in the management of adult obesity in primary care (over seven pages)

Author	Anderson and Wadden[130]	Rao[131]	Simkin-Silverman *et al*[132]	Logue and Smucker[133]	Lyznicki *et al*[134]	Sherman *et al*[135]	Vallis *et al*[136]	Benotti[137]	Brown *et al*[138]	Choban *et al*[139]
Title	Treating the obese patient: suggestions for primary care practice	Office-based strategies for the management of obesity	Treatment of overweight and obesity in primary care practice: current evidence and future directions	Obesity management in primary care: changing the status quo	Obesity: assessment and management in primary care	Health coaching integration into primary care for the treatment of obesity	Modified 5 As: minimal intervention for obesity counseling in primary care	Patient preparation for bariatric surgery	Laparoscopic adjustable gastric banding	Bariatric surgery for morbid obesity: why, who, when, how, where, and then what?
Country	USA	USA	USA	USA	USA	USA	Canada	USA	Australia	USA
Year	1999	2010	2008	2001	2001	2013	2013	2014	2009	2002
Overview/opinion	Overview	Overview	Overview	Editorial	Overview	Opinion	Overview	Overview (bariatric)	Overview (bariatric)	Overview (bariatric)
Diagnosis	X	X	X	X	X	X	X	X	X	X
Coordination	X	X	X		X	X	X		X	X
Weight and height	X	X		X	X		X	X		
Waist circumference		X			X		X	X		
System level/ implementation										
Doctor–patient relationship										
Public health role										
Prevention										
Nutrition education	X	X	X	X			X			X
Physical activity education	X	X		X			X			
Behaviour modification	X	X		X			X			
Counselling/psychology							X			
Role modelling					X					
Group-based interventions										
Medications	X	X		X	X					
Bariatric surgery referral	X	X			X			X	X	X
Bariatric surgery work-up								X		
Bariatric surgery after care										X
Commercial weight loss programme referral	X	X								
Bariatric equipment in consultation room										
Standard care undefined										

Continued

Table 3 Continued

Author	Anderson and Wadden[130]	Rao[131]	Simkin-Silverman *et al*[132]	Logue and Smucker[133]	Lyznicki *et al*[134]	Sherman *et al*[135]	Vallis *et al*[136]	Benotti[137]	Brown *et al*[138]	Choban *et al*[139]
Exact role uncertain			X						X	
Person-centredness				X			X			
Whole person care				X	X		X	X		

Author	DeMaria[140]	Dixon[141]	Heber *et al*[142]	Karmali *et al*[143]	Pietras *et al*[144]	Richardson[145]	Shafipour *et al*[146]	Snow *et al*[147]	Van Sickle[148]	Virji and Murr[149]	Wilbert *et al*[150]
Title	Bariatric surgery for morbid obesity	Referral for a bariatric surgical consultation: it is time to set a standard of care	Endocrine and nutritional management of the post-bariatric surgery patient: an endocrine society clinical practice guideline	Bariatric surgery: a primer	Preoperative and postoperative management of the bariatric surgical patient	Bariatric society is here to help	What do I do with my morbidly obese patient? A detailed case study of bariatric surgery in Kaiser Permanente Southern California	Pharmacologic and surgical management of obesity in primary care: a clinical practice guideline from the American College of Physicians	Management of the challenging bariatric surgical patient	Caring for patients after bariatric surgery	Appetite suppressants as adjuncts for weight loss
Country	USA	Australia	USA	Canada	USA	USA	USA	USA	USA	USA	USA
Year	2007	2009	2010	2010	2007	2010	2009	2005	2007	2006	2011
Overview/opinion	Overview	Opinion	Expert opinion	Overview	Overview	Single opinion	Overview	Expert opinion	Overview	Overview	Overview
Diagnosis	X	X		X		X	X	X	X		X
Coordination	X	X		X		X	X	X	X		
Weight and height						X	X	X	X		X
Waist circumference											
System level/implementation											
Doctor–patient relationship											
Public health role											
Prevention											
Nutrition education							X	X			X
Physical activity education								X			X
Behaviour modification								X			
Counselling/psychology							X				
Role modelling											
Group-based interventions											
Medications								X			X
Bariatric surgery referral	X	X		X	X	X	X	X	X	X	
Bariatric surgery work-up	X			X							
Bariatric surgery after care	X		X	X	X		X		X	X	
Commercial weight loss programme referral											
Bariatric equipment in consultation room											
Standard care undefined											

Continued

Table 3 Continued

Author	DeMaria[140]	Dixon[141]	Heber *et al*[142]	Karmali *et al*[143]	Pietras *et al*[144]	Richardson[145]	Shafipour *et al*[146]	Snow *et al*[147]	Van Sickle[148]	Virji and Murr[149]	Wilbert *et al*[150]
Exact role uncertain	X									X	
Person-centredness									X		
Whole person care							X	X			

Author	Kolasa *et al*[151]	Mercer[152]	UK Health Development Agency[153]	Agrawal *et al*[154]	Brunton *et al*[155]	Bartlett[156]	Benjamin *et al*[157]	Birmingham *et al*[158]	Caulfield[159]	Cerveny[160]	Fitzpatrick *et al*[161]
Title	Weight loss strategies that really work	How useful are clinical guidelines for the management of obesity in general practice?	Care pathways for the prevention and management of obesity	Managing obesity like any other chronic condition. Long-term therapy may reduce comorbidity as well	Management of obesity in adults	Motivating patients toward weight loss: practical strategies for addressing overweight and obesity	Can primary care physician-driven community programs address the obesity epidemic among high-risk populations?	The management of adult obesity	Obesity, legal duties, and the family physician	Approaching the obese patients in primary health care in the Czech Republic	An evidence-based guide for obesity treatment in primary care
Country	USA	UK	UK	USA	USA	USA	USA	Canada	Canada	Czech Republic	USA
Year	2010	2009	2004	2000	2014	2003	2013	2003	2007	2007	2015
Overview/opinion	Overview	Guideline summary	Draft clinical pathway	Overview	Overview	Overview	Editorial overview	Overview	Legal overview	Overview	Overview
Diagnosis	X	X			X	X	X	X	X	X	X
Coordination	X	X	X		X	X	X	X	X	X	X
Weight and height	X	X			X	X		X		X	X
Waist circumference	X	X			X	X		X		X	X
System level/implementation		X					X				
Doctor–patient relationship		X		X	X	X			X	X	X
Public health role		X					X				
Prevention		X					X	X		X	
Nutrition education	X	X	X		X	X				X	X
Physical activity education	X	X			X	X				X	X
Behaviour modification	X	X	X		X	X				X	X
Counselling/psychology	X		X		X	X					
Role modelling											
Group-based interventions											
Medications	X	X		X	X	X		X		X	
Bariatric surgery referral	X	X			X	X		X			
Bariatric surgery work-up											
Bariatric surgery after care											
Commercial weight loss programme referral											
Bariatric equipment in consultation room											
Standard care undefined											
Exact role uncertain											

Continued

Table 3 Continued

Author	Kolasa *et al*[151]	Mercer[152]	UK Health Development Agency[153]	Agrawal *et al*[154]	Brunton *et al*[155]	Bartlett[156]	Benjamin *et al*[157]	Birmingham *et al*[158]	Caulfield[159]	Cerveny[160]	Fitzpatrick *et al*[161]
Person-centredness		X			X	X		X	X	X	X
Whole person care		X			X	X		X		X	X

Author	Frank[162]	Gandjour *et al*[163]	Grief[164]	Grima and Dixon[165]	Hagaman[166]	Hill[167]	Hill and Wyatt[168]	Iacobucci[169]	Kausman and Bruere[170]	Kolasa[171]
Title	A multidisciplinary approach to obesity management: the physician's role and team care alternatives	Development process of an evidence-based guideline for the treatment of obesity	Strategies to facilitate weight loss in patients who are obese	Obesity—recommendations for management in general practice and beyond	FP's patients are successful 'losers'	Dealing with obesity as a chronic disease	Outpatient management of obesity: a primary care perspective	Pay GPs to tackle obesity, doctors urge UK government	If not dieting, now what?	Summary of clinical guidelines on the identification, evaluation, and treatment of overweight and obesity
Country	USA	Germany	USA	Australia	USA	USA	USA	UK	Australia	USA
Year	1998	2001	2010	2013	2010	1998	2002	2014	2006	1999
Overview/opinion	Overview	Overview	Single opinion	Overview	Single opinion	Overview	Overview	Single opinion	Overview	Overview
Diagnosis	X	X	X	X	X	X	X	X	X	X
Coordination	X	X	X	X	X	X		X	X	X
Weight and height		X	X	X		X	X	X		X
Waist circumference			X	X		X	X	X		X
System level/implementation								X		
Doctor–patient relationship				X	X		X		X	X
Public health role								X		
Prevention										
Nutrition education				X			X		X	
Physical activity education				X			X			
Behaviour modification			X	X			X		X	
Counselling/psychology				X			X		X	
Role modelling					X					
Group-based interventions			X							
Medications	X	X		X			X			
Bariatric surgery referral	X	X		X			X	X		
Bariatric surgery work-up										
Bariatric surgery after care										
Commercial weight loss programme referral										
Bariatric equipment in consultation room							X			
Standard care undefined								X		
Exact role uncertain		X								X
Person-centredness			X		X		X		X	X
Whole person care				X	X		X			

Continued

Table 3 Continued

Author	Kushner[172]	Landau and Moulton[173]	Lenfant[174]	Maryon-Davis[175]	Mogul *et al*[176]	Newton *et al*[177]	Nichols and Bazemore[178]	Nonas[179]	Orzano and Scott[180]	Ossolinski *et al*[181]
Title	Tackling obesity: is primary care up to the challenge?	General principles in the primary care of obesity	Physicians need practical tools to treat the complex problems of overweight and obesity	Weight management in primary care: how can it be made more effective?	New perspectives on diagnosis and treatment of obesity Winnable Battles: family physicians play an essential role in addressing tobacco use and obesity	Supporting behavior change in overweight patients: a guide for the primary care physician Winnable Battles: family physicians play an essential role in addressing tobacco use and obesity for the primary care physician	Winnable Battles: family physicians play an essential role in addressing tobacco use and obesity	A model for chronic care of obesity through dietary treatment	Diagnosis and treatment of obesity in adults: an applied evidence-based review	Weight management practices and evidence for weight loss through primary care: a brief review
Country	USA	USA	USA	UK	USA	USA	USA	USA	USA	Australia
Year	2010	1992	2001	2005	1999	2008	2014	1998	2004	2015
Overview/opinion	Editorial	Overview	Editorial	Overview	Overview	Overview	Editorial	Overview	Overview	Overview
Diagnosis	X	X	X	X	X	X	X	X	X	X
Coordination	X			X		X	X	X	X	X
Weight and height	X		X		X				X	X
Waist circumference			X		X					X
System level/implementation	X						X			
Doctor–patient relationship		X	X			X			X	
Public health role	X						X			
Prevention	X									
Nutrition education	X	X	X	X	X	X			X	X
Physical activity education	X	X	X	X	X	X			X	X
Behaviour modification	X	X	X		X	X		X	X	
Counselling/psychology	X	X				X				
Role modelling										
Group-based interventions	X									
Medications	X	X	X	X	X	X		X	X	X
Bariatric surgery referral		X	X	X	X	X			X	X
Bariatric surgery work-up										
Bariatric surgery after care										
Commercial weight loss programme referral				X						X
Bariatric equipment in consultation room										
Standard care undefined	X									X
Exact role uncertain					X		X			
Person-centredness		X	X			X	X	X	X	
Whole person care		X	X				X	X	X	

Continued

Table 3 Continued

Author	Plourde and Prud'homme [182]	Rao *et al* [183]	Robinson *et al* [184]	Ruser *et al* [185]	Scherger [186]	Schlair *et al* [187]	Spira [188]	Thompson *et al* [189]	Tsai *et al* [190]
Title	Managing obesity in adults in primary care	New and emerging weight management strategies for busy ambulatory settings: a scientific statement from the American Heart Association: endorsed by the society of behavioral medicine	Obesity: a move from traditional to more patient-oriented management	Whittling away at obesity and overweight: small lifestyle changes can have the biggest impact	Primary care physicians: on the front line in the fight against obesity	How to deliver high-quality obesity counseling in primary care using the 5As framework	Managing obesity in general practice	Treatment of obesity	Obesity
Country	Canada	USA	USA	USA	USA	USA	UK	USA	USA
Year	2012	2011	1995	2005	1999	2012	1983	2007	2010
Overview/opinion	Overview	Overview	Overview	Overview	Overview	Overview	Single opinion	Overview	Overview
Diagnosis	X	X	X	X	X	X	X	X	X
Coordination	X	X		X	X				X
Weight and height	X			X	X	X		X	X
Waist circumference	X			X	X	X		X	X
System level/implementation									
Doctor–patient relationship			X				X		X
Public health role									X
Prevention				X					
Nutrition education	X		X	X	X	X	X	X	X
Physical activity education	X		X	X	X	X	X	X	X
Behaviour modification	X			X	X	X	X	X	X
Counselling/psychology	X		X			X			X
Role modelling									
Group-based interventions						X			
Medications	X	X		X	X	X	X	X	X
Bariatric surgery referral	X		X	X		X	X	X	
Bariatric surgery work-up									
Bariatric surgery after care									
Commercial weight loss programme referral							X		
Bariatric equipment in consultation room									
Standard care undefined									
Exact role uncertain		X							
Person-centredness			X			X			
Whole person care			X		X				X

Continued

Table 3 Continued

Author	Yanovski[191]	Australian Medical Association[192]	Zwar and Harris[193]	Hainer[194]	Seidell *et al*[195]	Anderson[196]	Jarvis[197]	Lowery[198]	van Avendonk *et al*[199]	Al-Quaiz[200]	Carvajal *et al*[201]	Kushner and Ryan[202]	Obesity Australia[203]
Title	A practical approach to treatment of the obese patient	Your family doctor—keeping you healthy AMA family doctor week, 20–26 July 2014	Are GPs doing enough to help patients lose weight?	How should the obese patient be managed? Possible approaches to a national obesity management network	An integrated health care standard for the management and prevention of obesity in The Netherlands	Reducing overweight and obesity: closing the gap between primary care and public health	Obesity and the overworked GP	Medical home concept: policy implications for an integrated approach in obesity management	Primary care and public health a natural alliance? The introduction of the guidelines for obesity and undernutrition of the Dutch College of General Practitioners	Current concepts in the management of obesity: an evidence based review	Managing obesity in primary care practice: a narrative review	Assessment and lifestyle management of patients with obesity: clinical recommendations from systematic reviews	The mission of Obesity Australia is to drive change in the public perceptions of obesity, its prevalence and its treatment.
Country	USA	Australia	Australia	Czech Republic	Netherlands	Spain	UK	USA	Netherlands	Saudi Arabia	USA	USA	Australia
Year	1993	2014	2013	1999	2012	2008	2006	2010	2012	2001	2013	2014	2013
Overview/opinion	Overview	Media release	Blog	Overview	Overview	Overview	Overview	Overview	Overview	Overview	Overview	Overview	Statement
Diagnosis	X	X	X	X	X	X	X	X	X	X	X	X	X
Coordination	X		X	X	X	X	X	X	X	X	X	X	X
Weight and height	X			X	X	X	X		X	X	X	X	X
Waist circumference	X				X		X		X	X		X	
System level/ implementation						X	X	X	X				
Doctor–patient relationship	X				X		X		X	X	X		
Public health role						X	X		X				
Prevention					X		X		X				
Nutrition education	X	X		X	X	X	X		X	X		X	
Physical activity education	X	X		X	X	X	X		X	X		X	
Behaviour modification	X				X	X	X		X	X		X	
Counselling/psychology	X												
Role modelling													
Group-based interventions	X												
Medications	X									X	X	X	
Bariatric surgery referral	X		X	X					X	X	X	X	X
Bariatric surgery work-up													
Bariatric surgery after care													
Commercial weight loss programme referral	X										X	X	X
Bariatric equipment in consultation room													
Standard care undefined													
Exact role uncertain		X	X		X	X	X	X		X	X	X	X
Person-centredness	X								X				
Whole person care						X	X		X		X		

FP, family physician; GP, general practitioner.

Table 4 Current practice articles on the role of the family doctor in the management of adult obesity in primary care (over three pages)

Author	Bourn[204]	Alexander *et al*[205]	Alexander *et al*[206]	Klumbiene *et al*[207]	Linné *et al*[208]	Patterson *et al*[209]	Hoyt[210]	Fransen *et al*[211]	Cohen *et al*[212]	Fobi *et al*[213]
Title	Tackling obesity in England	Do the five A's work when physicians counsel about weight loss?	Weight-loss talks: what works (and what doesn't)	Advising overweight persons about diet and physical activity in primary health care: Lithuanian health behaviour monitoring study	Success rate of Orlistat in primary-care practice is limited by failure to follow prescribing recommendations: the referral letter content vs clinical reality	Prescribing for weight loss in primary care: evidence from a population based study	Person, place, and prevention in primary care: a multilevel analysis of variation in the delivery of mental health, substance-use disorder, and obesity services	The development of a minimal intervention strategy to address overweight and obesity in adult primary care patients in The Netherlands	Laparoscopic Roux-en-Y gastric bypass for BMI<35 kg/m^2: a tailored approach	Gastric bypass in patients with BMI<40 but >32 without life-threatening comorbidities: preliminary report
Country	England	USA	USA	Lithuania	Sweden	Northern Ireland	USA	Netherlands	USA	Brazil
Year	2001	2011	2011	2006	2003	2013	2013	2008	2006	2002
Methodology	Government report	Qualitative	Qualitative	Survey	Survey	Audit	Survey	Qualitative	Audit	Audit
Diagnosis	X	X	X		X		X	X	X	X
Coordination	X	X			X		X	X	X	X
Weight and height		X			X		X	X		
Waist circumference								X		
System level/implementation	X						X	X		
Doctor–patient relationship								X		
Public health role							X			
Prevention							X			
Nutrition education	X	X	X		X		X	X		
Physical activity education	X	X	X				X	X		
Behaviour modification		X					X	X		
Counselling/psychology							X			
Role modelling										
Group-based interventions										
Medications	X				X	X				
Bariatric surgery referral	X								X	
Bariatric surgery work-up										
Bariatric surgery after care										
Commercial weight loss programme referral										
Bariatric equipment in consultation room										
Standard care undefined					X					
Exact role uncertain	X						X			
Person-centredness								X		
Whole person care								X	X	
Under-recognition/undertreatment mentioned	X			X	X			X		

Author	Kloek *et al*[214]	Antognoli *et al*[215]	Nursing Standard[216]	Binnie[217]	Bramlage *et al*[218]	Kraschnewski *et al*[219]	Morris *et al*[220]	Sammut *et al*[221]	Smith *et al*[222]	Sonntag *et al*[223]	Timmerman *et al*[224]
Title	Dutch general practitioners' weight management policy for overweight and obese patients	Direct observation of weight counselling in primary care: alignment with clinical guidelines	GPs failing to offer weight-loss advice to people who need it	Ten-year follow-up of obesity	Recognition and management of overweight and obesity in primary care in Germany	A silent response to the obesity epidemic: decline in US physician weight counseling	Who gets what treatment for obesity? A survey of GPs in Scotland	Audit of the diagnosis and management of adult obesity in a Maltese general practice	U.S. primary care physicians' diet-, physical activity-, and weight-related care of adult patients	Counseling overweight patients: analysis of preventive encounters in primary care	Weight management practices among primary care providers
Country	Netherlands	USA	UK	UK	Germany	USA	Scotland	Malta	USA	Germany	USA
Year	2014	2014	2015	1977	2004	2013	1999	2012	2011	2010	2000
Methodology	Cross-sectional survey	Direct observation	Editorial	Clinical audit	Cross-sectional survey	Clinical audit	Cross-sectional survey	Clinical audit	Clinical audit	Cross-sectional survey	Cross-sectional survey
Diagnosis	X	X	X	X	X	X	X	X	X	X	X
Coordination	X	X			X		X	X		X	X
Weight and height	X	X		X	X		X	X	X	X	

Continued

Table 4 Continued

Author	Kloek *et al*[214]	Antognoli *et al*[215]	Nursing Standard[216]	Binnie[217]	Bramlage *et al*[218]	Kraschnewski *et al*[219]	Morris *et al*[220]	Sammut *et al*[221]	Smith *et al*[222]	Sonntag *et al*[223]	Timmerman *et al*[224]
Waist circumference	X	X						X	X		
System level/implementation											
Doctor–patient relationship	X			X						X	
Public health role											
Prevention							X				
Nutrition education	X	X	X	X	X	X	X	X	X	X	X
Physical activity education	X	X	X		X	X	X	X	X	X	X
Behaviour modification		X	X				X	X	X	X	X
Counselling/psychology							X				
Role modelling											
Group-based interventions		X					X				X
Medications	X	X	X	X			X	X	X		X
Bariatric surgery referral		X					X	X	X		
Bariatric surgery work-up											
Bariatric surgery after care											
Commercial weight loss programme referral		X					X				X
Bariatric equipment in consultation room											
Standard care undefined											
Exact role uncertain						X					
Person-centredness											
Whole person care	X	X									
Under-recognition/undertreatment mentioned	X		X		X	X			X	X	X

Author	Gaglioti *et al*[225]	Morris and Gravelle[226]	Huber *et al*[227]	Asselin *et al*[228]
Title	Primary care's ecologic impact on obesity	GP supply and obesity	Obesity management and continuing medical education in primary care: results of a Swiss survey	Missing an opportunity: the embedded nature of weight management in primary care
Country	USA	UK	Switzerland	Canada
Year	2009	2008	2011	2015
Methodology	Epidemiology	Cross-sectional survey	Cross-sectional survey	Qualitative
Diagnosis	X	X	X	X
Coordination			X	X
Weight and height			X	X
Waist circumference			X	
System level/implementation	X			X
Doctor–patient relationship				
Public health role	X			
Prevention	X			
Nutrition education			X	X
Physical activity education			X	X
Behaviour modification			X	X
Counselling/psychology				
Role modelling				

Continued

Table 4 Continued

Author	Gagliotti *et al*[225]	Morris and Gravelle[226]	Huber *et al*[227]	Aegelin *et al*[228]
Group-based interventions				
Medications				
Bariatric surgery referral				
Bariatric surgery work-up				
Bariatric surgery after care				
Commercial weight loss programme referral				
Bariatric equipment in consultation room				
Standard care undefined				
Exact role uncertain	X	X		X
Person-centredness				X
Whole person care				X
Under-recognition/undertreatment mentioned				X

GP, general practitioner.

seven of the interventions could person-centredness be seen in the description of the intervention.

Overview and opinion articles generally reported that the family doctor should be involved in all stages of management from diagnosis, nutrition and physical activity counselling, and ongoing follow-up. Not surprisingly, papers that were mainly about pharmacological interventions or bariatric surgery were only about that area of management. Bariatric surgery papers described the family doctor as required for referral, but not work-up, and some described the family doctor's role in ongoing management after surgery.

Overall, the family doctor was commonly involved in the diagnosis of obesity, and as a referral source into intervention trials. Frequently, the under-recognition and management of obesity was noted in observational studies of current practice. It was difficult to identify the pillars of primary care practice in the description on interventions for adult obesity management.

What do primary care guidelines say about the role of the family doctor? What do peak bodies (ie, advocacy groups) say about the role of the family doctor? Are these both in line with what is conveyed by current research?

In terms of the specific role of the family doctor, guidelines were variable and ranged from no mention of the family doctor, to the family doctor being involved in every stage of management from diagnosis and advice on nutrition and physical activity, to intensive treatments and long-term follow-up. Not surprisingly, guidelines written by family medicine organisations described a greater role for the family doctor. For guidelines that were written with a national healthcare focus, there was less detail on the type of professional that should be involved in each of the management areas.

Seven of the 16 guidelines specifically mentioned family doctors (or synonym), with one referring to 'primary care providers' (table 5). Seven (44%) suggested the family doctor should be involved in anthropometric measures of the patient, five (31%) recommended the family doctor should provide nutrition and physical activity advice, and seven discussed the referral to allied health providers by the family doctor.

DISCUSSION

This scoping review synthesises the current literature on the role of the family doctor in the management of obesity in primary care. This comprehensive set of articles provides the research community with a resource for further study, for example, systematic reviews and meta-analyses based on different aspects of primary care management of adult obesity.

The family doctor is mostly used as a recruitment source in primary care interventions, the majority of which have been carried out in the USA. This is in contrast to guidelines, clinical overviews and opinions that suggest a role for family doctors from diagnosis,

Table 5 International guidelines on the management of adult obesity in primary care, the role of the family doctor (FD) (over two pages)

Guideline	Country	Year	Intended for an FD audience?	FD mentioned	Primary healthcare mentioned	FD—measure the patient	FD— nutrition/ physical activity advice	FD—behavioural supports	FD—frequency of visits mentioned	FD—advice on use of intensive treatments	FD—referral to allied health	FD—referral to specialist obesity services	Does not mention specific role for FD
RACGP SNAP—Overweight and obesity, 2nd edition[229]	Australia	2015	X	X	X	X	X		X	X	X		
National Institute for Health and Care Excellence 'Managing adults who are overweight or obese'[230]	UK	2015	X										X
Recommendations for prevention of weight gain and use of behavioural and pharmacological interventions to manage overweight and obesity in adults in primary care Canadian Task Force on Preventive Health Care[231]	Canada	2015	X		X								X
Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia[1]	Australia	2013	X	X	X	X		X	X	X	X	X	
Institute for Clinical Systems Improvement Health Care Guideline Prevention and Management of Obesity for Adults[232]	USA	2013	X		X								X
Guideline for the Management of Overweight and Obesity in Adults A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society[233]	USA	2013	Primary care practitioner (PCP)	PCP	X								X
New Zealand Primary Care Handbook 2012—Weight Management[234]	New Zealand	2012	X	X	X	X	X	X	X	X	X		
US Preventive Services Task Force Screening for and Management of Obesity in Adults: Recommendation Statement[235]	USA	2012	X	X	X	X	X	X	X		X	X	
Screening for and management of obesity in adults: US Preventive Services Task Force recommendation statement[236]	USA	2012	X		X	X					X	X	
RACGP guidelines for preventive activities in general practice, 8th edition; 7.2 Overweight[237]	Australia	2012	X	X	X	X	X	X	X		X		

Continued

Table 5 Continued

Guideline	Country	Year	Intended for an FD audience?	FD mentioned	Primary healthcare mentioned	FD—measure the patient	FD— nutrition/ physical activity advice	FD—behavioural supports	FD—frequency of visits mentioned	FD—advice on use of intensive treatments	FD—referral to allied health	FD—referral to specialist obesity services	Does not mention specific role for FD
National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people, 2nd edition, Overweight/Obesity[238]	Australia	2012	X	X	X								X
British Columbia Ministry of Health Services primary care providers have an important role in preventing and managing obesity through services offered to patients[239]	Canada	2011	X		X								X
World Gastroenterological Organisation: Obesity Guideline[240]	International	2011	X		X								X
Scottish Intercollegiate Guidelines Network—Management of Obesity[241]	Scotland	2010	X		X								X
Dutch College of General Practitioners: Obesity Guideline[242]	Netherlands	2010	X	X	X	X	X	X	X		X		
WHO—Interventions on Diet and Physical Activity: What works[243]	WHO	2009	X		X								X

RACGP SNAP, Royal Australian College of General Practitioners "Smoking, Nutrition, Alcohol, Physical Activity".

offering lifestyle advice and behavioural support, and ongoing follow-up. Half of the articles that described current practice, mostly through clinical audits or surveys, reported that obesity was under-recognised by family doctors. There appears to be a misalignment between what commentators suggest as a role for the family doctor, and the current role they play in many primary care interventions.

The great majority of primary care interventions for adult obesity are being developed and tested in the USA healthcare setting. This has implications for the interpretation of the findings for translation into other contexts.[17] For example, the USA does not have a 'gatekeeper' function for family doctors and patients are able to self-refer to tertiary services.[18] Patients with health insurance also have different access to care compared with those who do not have.[18] This may have ramification when translating an intervention to a context with universal healthcare access, such as the UK and Australia, and warrants further investigation.

We were also able to identify areas of concern for the publication of primary care research in obesity management. Twenty-seven of the interventions used standard care in the control arm, but standard care was poorly defined in 15 of these interventions. It is difficult to determine the relative effectiveness of new interventions in the management of obesity in primary care when they are compared with poorly defined standard care. More worryingly was the use of substandard care where family doctors were advised not to give lifestyle advice to patients.[16] This suggests that usual care was artificially reduced in order to improve the apparent effectiveness of an intervention. This is a dubious practice from an ethical and scientific perspective and undermines the role of family doctors in obesity management.

Implications for practice

Guidelines are documents that are developed to assist practitioners in deciding on a course of action in a specific clinical circumstance[19] and they often determine a standard of care. The obesity guidelines that were identified in this review had varying recommendations for the role of the family doctor. In some jurisdictions, including Australia, national guidelines do not often recommend that a specific profession must be responsible for a task, unless the task is limited to the scope of one profession alone. In contrast, in the Netherlands where the central role of family doctors is prescribed within the health system, family doctors are likely to have a foundational role in all guidelines that are produced. The role of guidelines and their development varies between nations and health systems and the centrality of the role of the family doctor in a guideline may reflect the strength of primary care in the specific healthcare system. Therefore, guidelines may not always be the definitive source for determining the clinical scope and responsibilities of specific professional groups such as family doctors in obesity care.

Implications for research

Poor descriptions of interventions could have been aided by adherence to the TIDieR guidelines.[15] Specifically, the TIDieR guidelines suggest the health professionals involved in an intervention should be described in terms of their professional background, their expertise and any specific training given. The terms used to describe a family doctor were diverse in the intervention papers and ranged from primary care physician, primary care provider, family physician or general practitioner. The range of terms that are used in the primary care literature makes it impossible to understand the qualifications of professionals involved in the interventions. Trials from the USA often use 'primary care providers' or 'primary care practitioners', nebulous terms that could include a variety of professionals with vastly different training. This is particularly problematic when international primary care teams attempt to translate interventions to their local context. An international taxonomy for describing family doctors could assist in solving this issue.

The primary care literature has thoroughly described the fundamental factors that make primary care effective.[9] However, it was challenging for reviewers to determine if interventions were inclusive of the principles of person-centredness and whole person care. Knowing that first point of contact, whole person, coordinated, person-centred, continuous care, is important in primary care; it would be helpful for primary care interventions to explicitly consider these factors in their design. Additionally, the specific reporting of these factors in primary care trials would be helpful in publications to improve the understanding of how and why primary care interventions work. It is perhaps important that primary care determines a specific set of reporting requirements for primary care research that could be added to the TIDieR checklist.

Limitations

This scoping review is limited to the context of obesity management in primary care. Articles that reported on other important and related topics like nutrition, lifestyle change or cardiovascular health were not included. We chose to limit the review to obesity as we were interested in this specific literature and wanted to maintain the depth of our data extraction while maintaining feasibility. The review was also limited to publications in the English language and this may have missed work that included family doctors in non-English speaking healthcare settings. We may have missed international guidelines that were not picked up in our search strategy. As expected in a scoping review, articles were not assessed for quality or the specific outcomes of reported trials. Further work would have to be done from the identified literature and this could include a thematic analysis. The aim of the scoping review is to widely and broadly search the literature to identify gaps and inconsistencies, and provide a platform for further systematic work.[20]

CONCLUSION

There appears to be a disconnect between how family doctors are involved in primary care interventions, the message that is found in academic literature and the apparent role of the family doctor in current practice. Guidelines that are developed by national bodies are not necessarily the definitive source of information for the discrete role of specific health professionals. Improvement is required in the reporting of primary care interventions, particularly in the professional background of those involved in the trial and the acknowledgement of the pillars of primary care in intervention development. This foundation work provides a platform for further interpretation of existing literature on the role of the family doctor in obesity management.

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REFERENCES

1. National Health and Medical Research Council. National Health and Medical Research Council*Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia*. In: ed. Melbourne: National Health and Medical Research Council, 2013.
2. Barnett K, Mercer SW, Norbury M, *et al*. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet* 2012;380:37–43.
3. Bayliss EA. Simplifying care for complex patients. *Ann Fam Med* 2012;10:3–5.
4. Tan D, Zwar NA, Dennis SM, *et al*. Weight management in general practice: what do patients want? *Med J Aust* 2006;185:73–5.
5. Sturgiss EA, van Weel C, Ball L, *et al*. Obesity management in Australian primary care: where has the general practitioner gone? *Aust J Prim Health* 2016;22:473.
6. Jansen S, Desbrow B, Ball L. Obesity management by general practitioners: the unavoidable necessity. *Aust J Prim Health* 2015;21:366–8.
7. Clark AM, Briffa TG, Thirsk L, *et al*. What football teaches us about researching complex health interventions. *BMJ* 2012;345:e8316.
8. Wong G, Westhorp G, Manzano A, *et al*. RAMESES II reporting standards for realist evaluations. *BMC Med* 2016;14:96.
9. Stange KC. Barbara Starfield: passage of the pathfinder of primary care. *Ann Fam Med* 2011;9:292–6.
10. Radcliffe Publishing. Chapter 1: Meeting people's health needs. In: Kidd M, ed. *The contribution of family medicine to improving health systems: a guidebook from the World Organization of Family Doctors*. 2nd Edn. London: Radcliffe Publishing, 2013:1–13.
11. Stange KC. A science of connectedness. *Ann Fam Med* 2009;7:387–95.
12. Stange KC. The paradox of the parts and the whole in understanding and improving general practice. *Int J Qual Health Care* 2002;14:267–8.
13. Gray DP, Evans P, Sweeney K, *et al*. Towards a theory of continuity of care. *J R Soc Med* 2003;96:160–6.
14. Sturgiss EA, Elmitt N, van Weel C, *et al*. The role of the family doctor in the management of adults who are obese: a scoping review protocol. *Springerplus* 2015;4:820.
15. Hoffmann TC, Glasziou PP, Boutron I, *et al*. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ* 2014;348:g1687.
16. Wadden TA, Volger S, Sarwer DB, *et al*. A two-year randomized trial of obesity treatment in primary care practice. *N Engl J Med* 2011;365:1969–79.
17. Pfadenhauer LM, Gerhardus A, Mozygemba K, *et al*. Making sense of complexity in context and implementation: the Context and Implementation of Complex Interventions (CICI) framework. *Implement Sci* 2017;12:21.
18. Shi L. The Impact of Primary Care: A Focused Review. *Scientifica* 2012;2012:22–.
19. Woolf S, Schünemann HJ, Eccles MP, *et al*. Developing clinical practice guidelines: types of evidence and outcomes; values and economics, synthesis, grading, and presentation and deriving recommendations. *Implement Sci* 2012;7:61.
20. The Joanna Briggs Institute. *The Joanna Briggs Institute Reviewers' Manual 2015 Methodology for JBI Scoping Reviews*. Adelaide, Australia: Joanna Briggs Institute, 2015.
21. Ashley JM, St Jeor ST, Perumean-Chaney S, *et al*. Meal replacements in weight intervention. *Obes Res* 2001;9 Suppl 4(Suppl 4):312S–20.
22. Ashley JM, St Jeor ST, Schrage JP, *et al*. Weight control in the physician's office. *Arch Intern Med* 2001;161:1599–604.
23. A new evidence-based model for weight management in primary care: The Counterweight Programme. *Journal of Human Nutrition and Dietetics* 2004;17:191–208.
24. Counterweight Project Team. The implementation of the Counterweight Programme in Scotland, UK. *Fam Pract* 2012;29 Suppl 1(Suppl 1):I139–I44.
25. Laws R; Counterweight Project Team. Current approaches to obesity management in UK Primary Care: the Counterweight Programme. *J Hum Nutr Diet* 2004;17:183-90.
26. Laws R; Counterweight Project Team. A new evidence-based model for weight management in primary care: the Counterweight Programme. *J Hum Nutr Diet* 2004;17:191-208.
27. McQuigg M, Brown J, Broom J, *et al*. Empowering primary care to tackle the obesity epidemic: the Counterweight Programme. *Eur J Clin Nutr* 2005;59 Suppl 1(SUPPL. 1):S93–S101.
28. McQuigg M, Brown JE, Broom J, *et al*. The Counterweight programme: Prevalence of CVD risk factors by body mass index and the impact of 10% weight change. *Obes Res Clin Pract* 2008;2:15–27.
29. McQuigg M, Brown JE, Broom JI, *et al*. Engaging patients, clinicians and health funders in weight management: the Counterweight Programme. *Fam Pract* 2008;25 Suppl 1(Suppl 1):i79–86.
30. Bolognesi M, Nigg CR, Massarini M, *et al*. Reducing obesity indicators through brief physical activity counseling (PACE) in Italian primary care settings. *Ann Behav Med* 2006;31:179–85.
31. Bodenlos JS. Impact of a stage-matched weight loss intervention on stage of change progression in predominantly African-American female primary care patients. *Dissertation Abstracts International: Section B: The Sciences and Engineering* 2007;67:7364.
32. Kerr J, Patrick K, Norman G, *et al*. Randomized control trial of a behavioral intervention for overweight women: impact on depressive symptoms. *Depress Anxiety* 2008;25:555–8.
33. Bennett GG, Warner ET, Glasgow RE, *et al*. Obesity treatment for socioeconomically disadvantaged patients in primary care practice. *Arch Intern Med* 2012;172:565–74.

34. Ritzwoller DP, Glasgow RE, Sukhanova AY, *et al*. Economic analyses of the Be Fit Be Well program: a weight loss program for community health centers. *J Gen Intern Med* 2013;28:1581–8.
35. Greaney ML, Quintiliani LM, Warner ET, *et al*. Weight Management Among Patients at Community Health Centers: The "Be Fit, Be Well" Study. *Obes Weight Manag* 2009;5:222–8.
36. Appel LJ, Clark JM, Yeh HC, *et al*. Comparative effectiveness of weight-loss interventions in clinical practice. *N Engl J Med* 2011;365:1959–68.
37. Bennett WL, Gudzune KA, Appel LJ, *et al*. Insights from the POWER practice-based weight loss trial: a focus group study on the PCP's role in weight management. *J Gen Intern Med* 2014;29:50–8.
38. Bennett WL, Wang NY, Gudzune KA, *et al*. Satisfaction with primary care provider involvement is associated with greater weight loss: Results from the practice-based POWER trial. *Patient Educ Couns* 2015;98:1099–105.
39. Jerome GJ, Yeh H-C, Dalcin A, *et al*. Treatment of Obesity in Primary Care Practice: The Practice Based Opportunities for Weight Reduction (POWER) Trial at Johns Hopkins. *Obes Weight Manag* 2009;5:216–21.
40. Alfaris N, Wadden TA, Sarwer DB, *et al*. Effects of a 2-year behavioral weight loss intervention on sleep and mood in obese individuals treated in primary care practice. *Obesity* 2015;23:558–64.
41. Tsai AG, Wadden TA, Volger S, *et al*. Cost-effectiveness of a primary care intervention to treat obesity. *Int J Obes* 2013;37:S31–S37.
42. Sarwer DB, Moore RH, Diewald LK, *et al*. The impact of a primary care-based weight loss intervention on the quality of life. *Int J Obes* 2013;37 Suppl 1(Supp 1):S25–S30.
43. Derbas J, Vetter M, Volger S, *et al*. Improving Weight Management in Primary Care Practice: A Possible Role for Auxiliary Health Professionals Collaborating with Primary Care Physicians. *Obes Weight Manag* 2009;5:210–5.
44. Volger S, Wadden TA, Sarwer DB, *et al*. Changes in eating, physical activity and related behaviors in a primary care-based weight loss intervention. *Int J Obes* 2013;37 Suppl 1:S12–S18.
45. Vetter ML, Wadden TA, Chittams J, *et al*. Effect of lifestyle intervention on cardiometabolic risk factors: results of the POWER-UP trial. *Int J Obes* 2013;37 Suppl 1(Suppl 1):S19–S24.
46. Wadden TA, Volger S, Tsai AG, *et al*. Managing obesity in primary care practice: an overview with perspective from the POWER-UP study. *Int J Obes* 2013;37 Suppl 1(Suppl 1):S3–S11.
47. Tsai AG, Wadden TA, Rogers MA, *et al*. A primary care intervention for weight loss: results of a randomized controlled pilot study. *Obesity* 2010;18:1614–8.
48. Banerjee ES, Gambler A, Fogleman C. Adding obesity to the problem list increases the rate of providers addressing obesity. *Fam Med* 2013;45:629–33.
49. Blonstein AC, Yank V, Stafford RS, *et al*. Translating an evidence-based lifestyle intervention program into primary care: lessons learned. *Health Promot Pract* 2013;14:491–7.
50. Barnes ER, Theeke LA, Mallow J. Impact of the Provider and Healthcare team Adherence to Treatment Guidelines (PHAT-G) intervention on adherence to national obesity clinical practice guidelines in a primary care centre. *J Eval Clin Pract* 2015;21:300–6.
51. Booth AO, Nowson CA, Huang N, *et al*. Evaluation of a brief pilot nutrition and exercise intervention for the prevention of weight gain in general practice patients. *Public Health Nutr* 2006;9:1055–61.
52. Bordowitz R, Morland K, Reich D. The use of an electronic medical record to improve documentation and treatment of obesity. *Fam Med* 2007;39:274–9.
53. Bowerman S, Bellman M, Saltsman P, *et al*. Implementation of a primary care physician network obesity management program. *Obes Res* 2001;9 Suppl 4:321S–5.
54. Clark D, Chrysler L, Perkins A, *et al*. Screening, referral, and participation in a weight management program implemented in five CHCs. *J Health Care Poor Underserved* 2010;21:617–28.
55. Clark DO, Keith N, Chrysler L, *et al*. Design and reach of a primary care weight management program. *J Health Care Poor Underserved* 2008;19:171–9.
56. Coupar AM, Kennedy T. Running a weight control group: experiences of a psychologist and a general practitioner. *J R Coll Gen Pract* 1980;30:41–8.
57. Cutler L, King B, McCarthy N, *et al*. Appetite for life: an evaluation of a primary care lifestyle programme. *J Prim Health Care* 2010;2:281–7.
58. Doering T, Harwell S, Fassler C, *et al*. An interventional pilot study on obesity among low-income patients using a computer-based weight management module. *J Community Hosp Intern Med Perspect* 2013;3:20072.
59. Dutton GR, Phillips JM, Kukkamalla M, *et al*. Pilot study evaluating the feasibility and initial outcomes of a primary care weight loss intervention with peer coaches. *Diabetes Educ* 2015;41:361–8.
60. Eichler K, Zoller M, Steurer J, *et al*. Cognitive-behavioural treatment for weight loss in primary care: a prospective study. *Swiss Med Wkly* 2007;137(35-36):489–95.
61. Ely AC, Banitt A, Befort C, *et al*. Kansas primary care weighs in: a pilot randomized trial of a chronic care model program for obesity in 3 rural Kansas primary care practices. *J Rural Health* 2008;24:125–32.
62. Feigenbaum A, Pasternak S, Zusk E, *et al*. Influence of intense multidisciplinary follow-up and orlistat on weight reduction in a primary care setting. *BMC Fam Pract* 2005;6:5.
63. Kanke S, Kawai T, Takasawa N, *et al*. Interventions for body weight reduction in obese patients during short consultations: an open-label randomized controlled trial in the Japanese primary care setting. *Asia Pac Fam Med* 2015;14:5.
64. Fuller NR, Colagiuri S, Schofield D, *et al*. A within-trial cost-effectiveness analysis of primary care referral to a commercial provider for weight loss treatment, relative to standard care--an international randomised controlled trial. *Int J Obes* 2013;37:828–34.
65. Holzapfel C, Cresswell L, Ahern AL, *et al*. The challenge of a 2-year follow-up after intervention for weight loss in primary care. *Int J Obes* 2014;38:806–11.
66. Jebb SA, Ahern AL, Olson AD, *et al*. Primary care referral to a commercial provider for weight loss treatment versus standard care: a randomised controlled trial. *Lancet* 2011;378:1485–92.
67. Huerta S, Li Z, Li HC, Hc L, *et al*. Feasibility of a partial meal replacement plan for weight loss in low-income patients. *Int J Obes Relat Metab Disord* 2004;28:1575–9.
68. Garies S, Irving A, Williamson T, *et al*. Using EMR data to evaluate a physician-developed lifestyle plan for obese patients in primary care. *Can Fam Physician* 2015;61:e225–e31.
69. Gusi N, Reyes MC, Gonzalez-Guerrero JL, *et al*. Cost-utility of a walking programme for moderately depressed, obese, or overweight elderly women in primary care: a randomised controlled trial. *BMC Public Health* 2008;8:231.
70. Haas WC, Moore JB, Kaplan M, *et al*. Outcomes from a medical weight loss program: primary care clinics versus weight loss clinics. *Am J Med* 2012;125:603.e7–603.e11.
71. Crawford-Faucher A. Which weight-loss programs are most effective? *American Family Physician* 2012;86:280–2.
72. Jolly K, Daley A, Adab P, *et al*. A randomised controlled trial to compare a range of commercial or primary care led weight reduction programmes with a minimal intervention control for weight loss in obesity: the Lighten Up trial. *BMC Public Health* 2010;10:439.
73. Jolly K, Lewis A, Beach J, *et al*. Comparison of range of commercial or primary care led weight reduction programmes with minimal intervention control for weight loss in obesity: lighten Up randomised controlled trial. *BMJ* 2011;343:d6500.
74. Hauner H, Meier M, Wendland G, *et al*. Weight reduction by sibutramine in obese subjects in primary care medicine: the SAT Study. *Exp Clin Endocrinol Diabetes* 2004;112:201–7.
75. Hoke CN, Franks S. Work site, physician's office, or medical university clinic: the effect of setting on success in a multidisciplinary weight-loss program. *Eat Behav* 2002;3:93–100.
76. Kumanyika S, Fassbender J, Phipps E, *et al*. Design, recruitment and start up of a primary care weight loss trial targeting African American and Hispanic adults. *Contemp Clin Trials* 2011;32:215–24.
77. Kumanyika SK, Fassbender JE, Sarwer DB, *et al*. One-year results of the Think Health! study of weight management in primary care practices. *Obesity* 2012;20:1249–57.
78. Kuppersmith NC, Miles TP. Effect of a BMI chart on weight management discussions in a primary care setting. *J Ky Med Assoc* 2006;104:519–22.
79. Laing BY, Mangione CM, Tseng CH, *et al*. Effectiveness of a smartphone application for weight loss compared with usual care in overweight primary care patients: a randomized, controlled trial. *Ann Intern Med* 2014;161(10 Suppl):S5–12.
80. Lewis A, Jolly K, Adab P, *et al*. A brief intervention for weight management in primary care: study protocol for a randomized controlled trial. *Trials* 2013;14:393.
81. Logue E, Sutton K, Jarjoura D, *et al*. Obesity management in primary care: assessment of readiness to change among 284 family practice patients. *J Am Board Fam Pract* 2000;13:164–71.
82. Logue E, Sutton K, Jarjoura D, *et al*. Transtheoretical model-chronic disease care for obesity in primary care: a randomized trial. *Obes Res* 2005;13:917–27.

83. Logue EE, Bourguet CC, Palmieri PA, *et al*. The better weight-better sleep study: a pilot intervention in primary care. *Am J Health Behav* 2012;36:319–34.
84. Lowe MR, Butryn ML, Thomas JG, *et al*. Meal replacements, reduced energy density eating, and weight loss maintenance in primary care patients: a randomized controlled trial. *Obesity* 2014;22:94–100.
85. Madigan CD, Jolly K, Lewis AL, *et al*. A randomised controlled trial of the effectiveness of self-weighing as a weight loss intervention. *Int J Behav Nutr Phys Act* 2014;11:11.
86. Martin PD, Rhode PC, Dutton GR, *et al*. A primary care weight management intervention for low-income African-American women. *Obesity* 2006;14:1412–20.
87. Martin PD, Dutton GR, Rhode PC, *et al*. Weight loss maintenance following a primary care intervention for low-income minority women. *Obesity* 2008;16:2462–7.
88. McDoniel SO, Wolskee P, Shen J. Treating obesity with a novel hand-held device, computer software program, and Internet technology in primary care: the SMART motivational trial. *Patient Educ Couns* 2010;79:185–91.
89. McDoniel S. The short-term effect of a technology based comprehensive weight reduction program for obese adults in a primary care medical clinic: A three month psychobehavioral study. 2008.
90. Mehring M, Haag M, Linde K, *et al*. Effects of a general practice guided web-based weight reduction program--results of a cluster-randomized controlled trial. *BMC Fam Pract* 2013;14:76.
91. Munsch S, Biedert E, Keller U. Evaluation of a lifestyle change programme for the treatment of obesity in general practice. *Swiss Med Wkly* 2003;133:133148–54.
92. O'Grady JS, Thacher TD, Chaudhry R. The effect of an automated clinical reminder on weight loss in primary care. *J Am Board Fam Med* 2013;26:745–50.
93. Olsen J, Willaing I, Ladelund S, *et al*. Cost-effectiveness of nutritional counseling for obese patients and patients at risk of ischemic heart disease. *Int J Technol Assess Health Care* 2005;21:194–202.
94. Pellegrini CA, Hoffman SA, Collins LM, *et al*. Optimization of remotely delivered intensive lifestyle treatment for obesity using the Multiphase Optimization Strategy: Opt-IN study protocol. *Contemp Clin Trials* 2014;38:251–9.
95. Richman RM, Webster P, Salgo AR, *et al*. A shared care approach in obesity management: the general practitioner and a hospital based service. *Int J Obes Relat Metab Disord* 1996;20:413–9.
96. Ross R, Lam M, Blair SN, *et al*. Trial of prevention and reduction of obesity through active living in clinical settings: a randomized controlled trial. *Arch Intern Med* 2012;172:414–24.
97. Ross R, Blair SN, Godwin M, *et al*. Prevention and Reduction of Obesity through Active Living (PROACTIVE): rationale, design and methods. *Br J Sports Med* 2009;43:57–63.
98. Rutten GM, Meis JJ, Hendriks MR, *et al*. The contribution of lifestyle coaching of overweight patients in primary care to more autonomous motivation for physical activity and healthy dietary behaviour: results of a longitudinal study. *Int J Behav Nutr Phys Act* 2014;11:11.
99. Saris WH, Koenders MC, Pannemans DL, *et al*. Outcome of a multicenter outpatient weight-management program including very-low-calorie diet and exercise. *Am J Clin Nutr* 1992;56:294S–6.
100. Stephens GS, Blanken SE, Greiner KA, *et al*. Visual prompt poster for promoting patient-physician conversations on weight loss. *Ann Fam Med* 2008;6 Suppl 1(SUPPL. 1):S33–S36.
101. Driehuis F, Barte JC, Ter Bogt NC, *et al*. Maintenance of lifestyle changes: 3-year results of the Groningen Overweight and Lifestyle study. *Patient Educ Couns* 2012;88:249–55.
102. Barte JC, ter Bogt NC, Beltman FW, *et al*. Process evaluation of a lifestyle intervention in primary care: implementation issues and the participants' satisfaction of the GOAL study. *Health Educ Behav* 2012;39:564–73.
103. ter Bogt NC, Bemelmans WJ, Beltman FW, *et al*. Preventing weight gain: one-year results of a randomized lifestyle intervention. *Am J Prev Med* 2009;37:270–7.
104. ter Bogt NC, Bemelmans WJ, Beltman FW, *et al*. Preventing weight gain by lifestyle intervention in a general practice setting: three-year results of a randomized controlled trial. *Arch Intern Med* 2011;171:306–13.
105. ter Bogt NC, Milder IE, Bemelmans WJ, *et al*. Changes in lifestyle habits after counselling by nurse practitioners: 1-year results of the Groningen Overweight and Lifestyle study. *Public Health Nutr* 2011;14:995–1000.
106. Thomas JG, Leahey TM, Wing RR. An automated internet behavioral weight-loss program by physician referral: a randomized controlled trial. *Diabetes Care* 2015;38:9–15.
107. Toth-Capelli KM, Brawer R, Plumb J, *et al*. Stage of change and other predictors of participant retention in a behavioral weight management program in primary care. *Health Promot Pract* 2013;14:441–50.
108. Tsai AG, Felton S, Hill JO, *et al*. A randomized pilot trial of a full subsidy vs. a partial subsidy for obesity treatment. *Obesity* 2012;20:1838–43.
109. Wadden TA, Berkowitz RI, Womble LG, *et al*. Randomized trial of lifestyle modification and pharmacotherapy for obesity. *N Engl J Med* 2005;353:2111–20.
110. Wilson DB, Johnson RE, Jones RM, *et al*. Patient weight counseling choices and outcomes following a primary care and community collaborative intervention. *Patient Educ Couns* 2010;79:338–43.
111. Wirth A. Reduction of body weight and co-morbidities by orlistat: The XXL - Primary Health Care Trial. *Diabetes, Obesity and Metabolism* 2005;7:21–7.
112. Yardley L, Ware LJ, Smith ER, *et al*. Randomised controlled feasibility trial of a web-based weight management intervention with nurse support for obese patients in primary care. *Int J Behav Nutr Phys Act* 2014;11:67.
113. Tsai AG, Felton S, Wadden TA, *et al*. A randomized clinical trial of a weight loss maintenance intervention in a primary care population. *Obesity* 2015;23:2015–21.
114. Ryan DH, Johnson WD, Myers VH, *et al*. Nonsurgical weight loss for extreme obesity in primary care settings: results of the Louisiana Obese Subjects Study. *Arch Intern Med* 2010;170:146–54.
115. Baillargeon JP, Carpentier A, Donovan D, *et al*. Integrated obesity care management system -implementation and research protocol. *BMC Health Serv Res* 2007;7:163.
116. Baillargeon JP, St-Cyr-Tribble D, Xhignesse M, *et al*. Impact of an integrated obesity management system on patient's care - research protocol. *BMC Obes* 2014;1:19.
117. Katz S, Feigenbaum A, Pasternak S, *et al*. An interactive course to enhance self-efficacy of family practitioners to treat obesity. *BMC Med Educ* 2005;5:4.
118. Buclin-Thiébaud S, Pataky Z, Bruchez V, *et al*. New psycho-pedagogic approach to obesity treatment: a 5-year follow-up. *Patient Educ Couns* 2010;79:333–7.
119. Feuerstein J, Takayasu K, Maltz A, *et al*. Teaching a lifestyle intervention for reversing impaired fasting glucose, hyperlipidemia and obesity/overweight to a cohort of local physicians. *Current Nutrition and Food Science* 2015;11:65–9.
120. Hartman SJ, Risica PM, Gans KM, *et al*. Tailored weight loss intervention in obese adults within primary care practice: rationale, design, and methods of Choose to Lose. *Contemp Clin Trials* 2014;38:409–19.
121. Lin M, Mahmooth Z, Dedhia N, *et al*. Tailored, interactive text messages for enhancing weight loss among African American adults: the TRIMM randomized controlled trial. *Am J Med* 2015;128:896–904.
122. Moore H, Summerbell CD, Greenwood DC, *et al*. Improving management of obesity in primary care: cluster randomised trial. *BMJ* 2003;327:1085.
123. Rodondi N, Humair JP, Ghali WA, *et al*. Counselling overweight and obese patients in primary care: a prospective cohort study. *Eur J Cardiovasc Prev Rehabil* 2006;13:222–8.
124. Rueda-Clausen CF, Benterud E, Bond T, *et al*. Effect of implementing the 5As of obesity management framework on provider-patient interactions in primary care. *Clin Obes* 2014;4:39–44.
125. Schuster RJ, Tasosa J, Terwoord NA. Translational research--implementation of NHLBI Obesity Guidelines in a primary care community setting: the Physician Obesity Awareness Project. *J Nutr Health Aging* 2008;12:764s–9.
126. Yank V, Stafford RS, Rosas LG, *et al*. Baseline reach and adoption characteristics in a randomized controlled trial of two weight loss interventions translated into primary care: a structured report of real-world applicability. *Contemp Clin Trials* 2013;34:126–35.
127. Goodyear-Smith F, McPhee J, Duncan S, *et al*. Evaluation of a primary care-based programme designed to increase exercise and improve nutrition in patients at risk. *J Prim Health Care* 2014;6:312–8.
128. Jay MR, Gillespie CC, Schlair SL, *et al*. The impact of primary care resident physician training on patient weight loss at 12 months. *Obesity* 2013;21:45–50.
129. Wadden TA, Berkowitz RI, Vogt RA, *et al*. Lifestyle modification in the pharmacologic treatment of obesity: a pilot investigation of a potential primary care approach. *Obes Res* 1997;5:218–26.

130. Anderson DA, Wadden TA. Treating the obese patient. Suggestions for primary care practice. *Arch Fam Med* 1999;8:156–67.
131. Rao G. Office-based strategies for the management of obesity. *Am Fam Physician* 2010;81:1449–56. quiz 29.
132. Simkin-Silverman LR, Conroy MB, King WC. Treatment of Overweight and Obesity in Primary Care Practice: Current Evidence and Future Directions. *Am J Lifestyle Med* 2008;2:296–304.
133. Logue EE, Smucker WD. Obesity management in primary care: changing the status quo. *J Fam Pract* 2001;50:520.
134. Lyznicki JM, Young DC, Riggs JA, *et al*. Obesity: assessment and management in primary care. *Am Fam Physician* 2001;63:2185–96.
135. Sherman R, Crocker B, Dill D, *et al*. Health coaching integration into primary care for the treatment of obesity. *Glob Adv Health Med* 2013;2:58–60.
136. Vallis M, Piccinini-Vallis H, Sharma AM, *et al*. Clinical review: modified 5 As: minimal intervention for obesity counseling in primary care. *Can Fam Physician* 2013;59:e1-e5:27–31.
137. Benotti P. *Patient Preparation for Bariatric Surgery*. USA: Springer, 2014.
138. Brown W, Korin A, Burton P, *et al*. Laparoscopic adjustable gastric banding. *Aust Fam Physician* 2009;38:972–6.
139. Choban PS, Jackson B, Poplawski S, *et al*. Bariatric surgery for morbid obesity: why, who, when, how, where, and then what? *Cleve Clin J Med* 2002;69:897–903.
140. DeMaria EJ. Bariatric surgery for morbid obesity. *N Engl J Med* 2007;356:2176–83.
141. Dixon JB. Referral for a bariatric surgical consultation: it is time to set a standard of care. *Obes Surg* 2009;19:641–4.
142. Heber D, Greenway FL, Kaplan LM, *et al*. Endocrine and nutritional management of the post-bariatric surgery patient: an Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab* 2010;95:4823–43.
143. Karmali S, Johnson Stoklossa C, Sharma A, *et al*. Bariatric surgery: a primer. *Can Fam Physician* 2010;56:873–9.
144. Pietras SM, Usdan LS, Apovian CM. Preoperative and Postoperative Management of the Bariatric Surgical Patient. *JCOM* 2007;14:262–74.
145. Richardson LA. Bariatric society is here to help. *J Fam Pract* 2010;59:488.
146. Shafipour P, Der-Sarkissian JK, Hendee FN, *et al*. What do I do with my morbidly obese patient? A detailed case study of bariatric surgery in kaiser permanente southern california. *Perm J* 2009;13:56–63.
147. Snow V, Barry P, Fitterman N, *et al*. Pharmacologic and surgical management of obesity in primary care: a clinical practice guideline from the American College of Physicians. *Ann Intern Med* 2005;142:525–31.
148. Van Sickle KR. Management of the challenging bariatric surgical patient. *Med Clin North Am* 2007;91:383–92.
149. Virji A, Murr MM. Caring for patients after bariatric surgery. *Am Fam Physician* 2006;73:1403–8.
150. Wilbert B, Mohundro BL, Shaw V, Andres A, *et al*. Appetite suppressants as adjuncts for weight loss. *Am Fam Physician* 2011;83:1–2.
151. Kolasa KM, Collier DN, Cable K. Weight loss strategies that really work. *J Fam Pract* 2010;59:378–85.
152. Mercer S. How useful are clinical guidelines for the management of obesity in general practice? *Br J Gen Pract* 2009;59:863–8.
153. Agency NHD. *Care pathways for the prevention and management of obesity*. London, UK: Health Development Agency, 2004.
154. Agrawal M, Worzniak M, Diamond L. Managing obesity like any other chronic condition. Long-term therapy may reduce comorbidity as well. *Postgrad Med* 2000;108:75–82.
155. Brunton SA, Skolnik NS, Ryan DH, *et al*. Management of obesity in adults. *The Journal of Family Practice* 2014;63:S1–S33.
156. Bartlett SJ. Motivating patients toward weight loss: practical strategies for addressing overweight and obesity. *Phys Sportsmed* 2003;31:29–36.
157. Benjamin RM, Yanovski SZ, Simons-Morton DG. Can primary care physician-driven community programs address the obesity epidemic among high-risk populations? *JAMA Intern Med* 2013;173:1778–9.
158. Birmingham CL, Jones P, Hoffer LJ. The management of adult obesity. *Eat Weight Disord* 2003;8:157–63.
159. Caulfield T, Obesity CT. Obesity, legal duties, and the family physician. *Can Fam Physician* 2007;53:1129–30.
160. Cerveny R. Approaching the obese patients in primary health care in the Czech Republic. *Bratisl Lek Listy* 2007;108:425–7.
161. Fitzpatrick SL, Wischenka D, Appelhans BM, *et al*. An Evidence-based Guide for Obesity Treatment in Primary Care. *Am J Med* 2016;129:115.e1–115.e7.
162. Frank A. A multidisciplinary approach to obesity management: the physician's role and team care alternatives. *J Am Diet Assoc* 1998;98:S44–8.
163. Gandjour A, Westenhöfer J, Wirth A, *et al*. Development process of an evidence-based guideline for the treatment of obesity. *Int J Qual Health Care* 2001;13:325–32.
164. Grief SN. Strategies to facilitate weight loss in patients who are obese. *Am Fam Physician* 2010;82:1434.
165. Grima M, Dixon JB. Obesity-recommendations for management in general practice and beyond. *Aust Fam Physician* 2013;42:532–41.
166. Hagaman M. FP's patients are successful "losers". *The Journal of Family Practice* 2010;59:488.
167. Hill JO. Dealing with obesity as a chronic disease. *Obes Res* 1998;6 Suppl 1:34S–8.
168. Hill JO, Wyatt H. Outpatient management of obesity: a primary care perspective. *Obes Res* 2002;10 Suppl 2:124S–30.
169. Iacobucci G. Pay GPs to tackle obesity, doctors urge UK government. *BMJ* 2014;348:g232.
170. Kausman R, Bruere T, dieting Inot. now what? *Australian family physician* 2006;35:572–5.
171. Kolasa K. Summary of clinical guidelines on the identification, evaluation, and treatment of overweight and obesity. *J Nutr Educ* 1999;31:114.
172. Kushner RF. Tackling obesity: is primary care up to the challenge? *Arch Intern Med* 2010;170:121–3.
173. Landau C, Moulton AW. General principles in the primary care of obesity. *R I Med* 1992;75:527–30.
174. Lenfant C. Physicians need practical tools to treat the complex problems of overweight and obesity. *Am Fam Physician* 2001;63:2139–46.
175. Maryon-Davis A. Weight management in primary care: how can it be made more effective? *Proc Nutr Soc* 2005;64:97–103.
176. Mogul HR, Rau J, Weinstein BI, *et al*. New perspectives on diagnosis and treatment of obesity. *Heart Dis* 1999;1:295–304.
177. Newton RL, Milsom VA, Nackers LM, *et al*. Supporting behavior change in overweight patients: a guide for the primary care physician. *JCOM* 2007;15:536–44.
178. Nichols J, Bazemore A. Winnable battles: family physicians play an essential role in addressing tobacco use and obesity. *Am Fam Physician* 2014;89:872.
179. Nonas CA. A model for chronic care of obesity through dietary treatment. *J Am Diet Assoc* 1998;98:S16–22.
180. Orzano AJ, Scott JG. Diagnosis and treatment of obesity in adults: an applied evidence-based review. *J Am Board Fam Pract* 2004;17:359–69.
181. Ossolinski G, Jiwa M, McManus A. Weight management practices and evidence for weight loss through primary care: a brief review. *Curr Med Res Opin* 2015;31:2011–20.
182. Plourde G, Prud'homme D. Managing obesity in adults in primary care. *Can Med Assoc J* 2012;184:1039–44.
183. Rao G, Burke LE, Spring BJ, *et al*. New and emerging weight management strategies for busy ambulatory settings: a scientific statement from the American Heart Association endorsed by the Society of Behavioral Medicine. *Circulation* 2011;124:1182–203.
184. Robinson BE, Gjerdingen DK, Houge DR. Obesity: a move from traditional to more patient-oriented management. *J Am Board Fam Pract* 1995;8:99–108.
185. Ruser CB, Federman DG, Kashaf SS. Whittling away at obesity and overweight. Small lifestyle changes can have the biggest impact. *Postgrad Med* 2005;117:37–40.
186. Scherger J. Primary care physicians: On the front line in the fight against obesity. *Cardiovascular reviews and reports* 1999;20:268–70.
187. Schlair S, Moore S, McMacken M, *et al*. How to deliver high-quality obesity counseling in primary care using the 5As framework. *JCOM* 2012;19:221–9.
188. Spira M. Managing obesity in general practice. *Practitioner* 1983;227:625–9.
189. Thompson WG, Cook DA, Clark MM, *et al*. Treatment of obesity. *Mayo Clin Proc* 2007;82:93–102. quiz 01-2.
190. Tsai AG, Carvajal R, Egner R, *et al*. Obesity. In: DiTomasso R, Golden B, Morris H, eds. *Handbook of cognitive behavioral approaches in primary care*. New York: Springer Publishing Company, 2010:595–630.
191. Yanovski SZ. A practical approach to treatment of the obese patient. *Arch Fam Med* 1993;2:309–16.
192. Australian Medical Association. Your family doctor – keeping you healthy. *Ama Family Doctor Week* 20142014:20–6.
193. Zwar N, Harris M. *The conversation are GPs doing enough to help patients lose weight?* Australia: The Conversation, 2013.

194. Hainer V. How should the obese patient be managed? Possible approaches to a national obesity management network. *Int J Obes Relat Metab Disord* 1999;23 (Suppl 4):S14–S19. discussion S18-9.
195. Seidell JC, Halberstadt J, Noordam H, *et al*. An integrated health care standard for the management and prevention of obesity in The Netherlands. *Fam Pract* 2012;29 (Suppl 1):i153–6.
196. Anderson P. Reducing overweight and obesity: closing the gap between primary care and public health. *Fam Pract* 2008;25 Suppl 1:i10–i16.
197. Jarvis S. Obesity and the overworked GP. *Br J Gen Pract* 2006;56:654–5.
198. Lowery B. Medical home concept: policy implications for an integrated approach in obesity management. *Bariatric Nursing and Surgical Patient Care* 2010;5:89–91.
199. van Avendonk MJ, Mensink PA, Drenthen AJ, *et al*. Primary care and public health a natural alliance? The introduction of the guidelines for obesity and undernutrition of the Dutch College of General Practitioners. *Fam Pract* 2012;29 Suppl 1(Suppl 1):i31–i35.
200. Al-Quaiz AJ. Current concepts in the management of obesity. An evidence based review. *Saudi Med J* 2001;22:205–10.
201. Carvajal R, Wadden TA, Tsai AG, *et al*. Managing obesity in primary care practice: a narrative review. *Ann N Y Acad Sci* 2013;1281:191–206.
202. Kushner RF, Ryan DH. Assessment and lifestyle management of patients with obesity: clinical recommendations from systematic reviews. *JAMA* 2014;312:943–52.
203. Australia O. The mission of Obesity Australia is to drive change in the public perceptions of obesity, its prevalence and its treatment. *Action Agenda. Australia* 2013.
204. Bourn J. General CaATackling Obesity in England. In: ed. London: National Audit Office, 2001.
205. Alexander SC, Cox ME, Boling Turer CL, *et al*. Do the five A's work when physicians counsel about weight loss? *Fam Med* 2011;43:179–84.
206. Alexander SC, Cox ME, Yancy WS, *et al*. Weight-loss talks: what works (and what doesn't). *J Fam Pract* 2011;60:213–9.
207. Klumbiene J, Petkeviciene J, Vaisvalavicius V, *et al*. Advising overweight persons about diet and physical activity in primary health care: Lithuanian health behaviour monitoring study. *BMC Public Health* 2006;6:30.
208. Linné Y, Rooth P, Rössner S. Success rate of Orlistat in primary-care practice is limited by failure to follow prescribing recommendations: the referral letter content vs clinical reality. *Int J Obes Relat Metab Disord* 2003;27:1434–5.
209. Patterson L, Patterson C, Kee F, *et al*. Prescribing for weight loss in primary care: evidence from a population based study. *J Epidemiol Community Health* 2013;67:530–2.
210. Person HA. place, and prevention in primary care: a multilevel analysis of variation in the delivery of mental health, substance-use disorder, and obesity services dissertation abstracts international section A. *Humanities and Social Sciences* 2013;73.
211. Fransen GA, Hiddink GJ, Koelen MA, *et al*. The development of a minimal intervention strategy to address overweight and obesity in adult primary care patients in The Netherlands. *Fam Pract* 2008;25 (Suppl 1):i112–5.
212. Cohen R, Pinheiro JS, Correa JL, *et al*. Laparoscopic Roux-en-Y gastric bypass for BMI < 35 kg/m(2): a tailored approach. *Surg Obes Relat Dis* 2006;2:401–4. Discussion 04.
213. Fobi M, Lee H, Igwe D, *et al*. Gastric bypass in patients with BMI < 40 but > 32 without life-threatening co-morbidities: preliminary report. *Obes Surg* 2002;12:52–6.
214. Kloek CJ, Tol J, Veenhof C, *et al*. Dutch General Practitioners' weight management policy for overweight and obese patients. *BMC Obes* 2014;1.
215. Antognoli EL, Smith KJ, Mason MJ, *et al*. Direct observation of weight counselling in primary care: alignment with clinical guidelines. *Clin Obes* 2014;4:69–76.
216. GPs failing to offer weight-loss advice to people who need it. *Nursing Standard* 2015;29:16.
217. Binnie GA. Ten-year follow-up of obesity. *J R Coll Gen Pract* 1977;27:492–5.
218. Bramlage P, Wittchen HU, Pittrow D, *et al*. Recognition and management of overweight and obesity in primary care in Germany. *Int J Obes Relat Metab Disord* 2004;28:1299–308.
219. Kraschnewski JL, Sciamanna CN, Stuckey HL, *et al*. A silent response to the obesity epidemic: decline in US physician weight counseling. *Med Care* 2013;51:186–92.
220. Morris SE, Lean ME, Hankey CR, *et al*. Who gets what treatment for obesity? A survey of GPs in Scotland. *Eur J Clin Nutr* 1999;53 (Suppl 2):S44–8.
221. Sammut D, Sammut D, Bonnici J. Audit of the diagnosis and management of adult obesity in a Maltese general practice. *Malta Medical Journal* 2012;24:16–20.
222. Smith AW, Borowski LA, Liu B, *et al*. U.S. primary care physicians' diet-, physical activity-, and weight-related care of adult patients. *Am J Prev Med* 2011;41:33–42.
223. Sonntag U, Henkel J, Renneberg B, *et al*. Counseling overweight patients: analysis of preventive encounters in primary care. *Int J Qual Health Care* 2010;22:486–92.
224. Timmerman GM, Reifsnider E, Allan JD. Weight management practices among primary care providers. *J Am Acad Nurse Pract* 2000;12:113–6.
225. Gaglioti A, Petterson SM, Bazemore AW, *et al*. Primary care's ecologic impact on obesity. *Am Fam Physician* 2009;79:446.
226. Morris S, Gravelle H. GP supply and obesity. *J Health Econ* 2008;27:1357–67.
227. Huber CA, Mohler-Kuo M, Zellweger U, *et al*. Obesity management and continuing medical education in primary care: results of a Swiss survey. *BMC Fam Pract* 2011;12:140.
228. Asselin J, Osunlana AM, Ogunleye AA, *et al*. Missing an opportunity: the embedded nature of weight management in primary care. *Clin Obes* 2015;5:325–32.
229. Smoking, nutrition, alcohol, physical activity (SNAP). *A population health guide to behavioural risk factors in general practice*. Second Edn. Melbourne: Royal Australian College of General Practitioners, 2015.
230. *Managing adults who are overweight or obese*. *NICE guidelines*. United Kingdom: National Institute for Health and Care Excellence, 2015.
231. Brauer P, Connor Gorber S, Shaw E, *et al*. Recommendations for prevention of weight gain and use of behavioural and pharmacologic interventions to manage overweight and obesity in adults in primary care. *CMAJ* 2015;187:184–95.
232. Institute for Clinical Systems Improvement Health Care. Institute for Clinical Systems Improvement Health CarePrevention and management of obesity for adults. In: ed. Sixth Edn, 2013. https://www.icsi.org/guidelines__more/catalog_guidelines_and_more/catalog_guidelines/catalog_endocrine_guidelines/obesity__adults/
233. Jensen MD, Ryan DH, Apovian CM, *et al*. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. *Circulation* 20142014;129:S102–38.
234. New Zealand Guidelines Group. *New Zealand Primary Care Handbook 2012*. 2012. Third Edn. Wellington, New Zealand: New Zealand Guidelines Group, 2012.
235. U.S. Preventive Services Task Force: Screening for and Management of Obesity in Adults: Recommendation Statement. *Am Fam Physician* 2012;86.
236. Moyer VA. U.S. Preventive Services Task Force. Screening for and management of obesity in adults: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med* 2012;157:373–8.
237. Overweight. *Guidelines for preventive activities in general practice*. 8th Edn. Melbourne: edRoyal Australian College of General Practitioners, 2012.
238. National Aboriginal Community Controlled Health Organisation (NACCHO) and The Royal Australian College of General Practitioners (RACGP). Overweight/Obesity. *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people*. Second Edn. Melbourne: Royal Australian College of General Practitioners, 2012.
239. Committee GaPA. Association BCM*Overweight and obese adults: diagnosis and management*. In: ed. British Columbia: British Columbia Medical Association, 2011.
240. Mathus-Vliegen L, Toouli J, Fried M, *et al*. Organisation WGObesity, In: ed. 2011. http://www.worldgastroenterology.org/guidelines/global-guidelines/obesity/obesity-english
241. Scottish Intercollegiate Guidelines Network. Scottish Intercollegiate Guidelines Network*Management of obesity: a national clinical guideline*. In: ed. Edinburgh: Scottish Intercollegiate Guidelines Network, 2010.
242. Binsbergen JV, Langens F, Dapper A, *et al*. Dutch College of General PractitionersObesity. In: ed. 2010. https://guidelines.nhg.org/product/obesity
243. World Health Organisation. *Interventions on Diet and Physical Activity: What works*. Geneva, Switzerland: World Health Organisation, 2009. http://www.who.int/dietphysicalactivity/summary-report-09.pdf?ua=1

Chapter 2b)

Obesity management in Australian primary care: where has the general practitioner gone?

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ABSTRACT

Obesity is a chronic condition with significant health and economic consequences that requires more effective management in Australia. General practitioners (GPs) currently act as care co-ordinators in line with national guidelines for overweight and obesity. Australian patients indicate that they would appreciate more involvement from their GP in the management of obesity and this is in line with international findings. Not all patients have access to specialist obesity services or affordable allied health care due to location, cost and time, particularly in rural and remote areas where there is a greater prevalence of obesity. Empowering GPs to use their skills as expert generalists to manage obesity is an option that should be explored to improve access for all individuals. GPs will require evidence-based tools to assist them in structuring obesity management within their own general practice environment.

Summary statement

What is known about the topic?

- General practitioners are caring for a growing number of people who are living with obesity.

What does this paper add?

- The expert generalist skill set of general practitioners could be better used to provide person-centred care for people with obesity with the support of evidence-based tools.

Obesity is a major public health issue in Australia that contributes to the rising prevalence of chronic diseases such as type 2 diabetes, cardiovascular disease and osteoarthritis (National Health and Medical Research Council 2013). Obesity increases an individual's physical and psychological health burden and adds $21 billion in direct costs to Australia's annual economic burden (Chen et al. 2011). Clearly, there is a need to take immediate and ongoing action to reduce the prevalence of obesity in Australia.

There is increasing evidence that obesity should be viewed as a chronic condition (Fildes et al. 2015), requiring ongoing management rather than a one-off "cure". Primary care has been the cornerstone of chronic disease management in the Australian healthcare system with the recognition that ongoing care from a trusted practitioner improves outcomes (Harris and Zwar 2007). Obesity is specifically managed in 0.7 per 100 encounters in Australian general practice (Britt et al. 2014), but is also managed as part of consultations for other conditions including diabetes, lipid disorders and arthritis.

Review of international guidelines for the role of general practitioners (GPs) in obesity management shows great variation in what is expected of the profession. Australian guidelines suggest a role of recognition and onward referral (National Health and Medical Research Council 2013). The New Zealand guidelines recommend GP delivered care within a community context (New Zealand Guidelines Group 2012). Conversely, there is no mention of general practice in the World Gastroenterology Organisation guideline (Mathus-Vliegen and Toouli 2011). In this review of the literature we investigate the current role of the GP in obesity management, and explore reasons for expanding the role of GPs in supporting patients with obesity to reduce their risk for chronic disease.

FEATURES OF GENERAL PRACTICE

General practice is an internationally recognised medical speciality that provides person-centred, longitudinal, and coordinated whole-person healthcare to individuals in their communities (Kidd 2013). The Australian Patient Experiences Survey found 86% of those over the age of 15 years visited a GP at least annually with increasing frequency of access with age (Australian Bureau of Statistics 2013). The survey also showed that of those who had seen a GP in the previous 12 months, more than 70% reported that the GP always listened carefully to them, always showed them respect and always spent enough time with them (Australian Bureau of Statistics 2013). Most Australians attend a regular GP or general practice thus providing good continuity of care (McRae et al. 2011). Australian GPs enjoy high rates of patient satisfaction and these therapeutic relationships could be better utilised in obesity care.

Currently, over 85% of all GP consultations are bulk billed with no point of care cost to the patient (Australian Bureau of Statistics 2013). Allied health services, such as dietetics and exercise physiology, are subsidised by Medicare only in the context of a chronic disease management plan and require the presence of co-morbidities (Foster et al. 2009). Uncomplicated obesity does not qualify for subsidised services in allied health which may make these services inaccessible for some

patients. The lower point of care cost to the patient may make GP-delivered obesity care more accessible especially for patients of low socioeconomic background.

CURRENT GUIDELINES

The Australian National Health and Medical Research Council (NHMRC) guidelines for the management of overweight and obesity in primary care recommend a usual healthcare practitioner, such as a GP, be involved as a care coordinator. The guidelines state the healthcare practitioner should recognise the condition of obesity, provide opportunity for ongoing anthropometric measurement and basic advice about nutrition and physical activity (National Health and Medical Research Council 2013). The healthcare practitioner is advised to have a low threshold for referring on to an allied health provider for further management. Specialist involvement is suggested if the patient has co-morbidities or a Body Mass Index (BMI) over 35kg/m2. Considering the prevalence of overweight and obesity, referral of most patients to specialist care is unlikely to be a practical reality. It is clear that better support is needed for GPs to manage patients with overweight or obesity.

Obesity management cannot be “one size fits all” as each patient has personal barriers to care and access to specialist obesity services are not available to the majority of Australians living outside the major capital cities (National Rural Health Alliance 2004). The financial cost of seeking these services can be high especially for patients who are overweight but lack the co-morbidities which allow access to Medicare rebates for allied health interventions (Pearce-Brown et al. 2011). The time cost to travel, meet and follow up with different health providers can make services unattainable or unacceptable for some patients (Tan et al. 2006; Pearce-Brown, Grealish et al. 2011; Arai et al. 2015). Providing general practice based options for obesity management will improve access for patients.

There is evidence that GPs are patients’ preferred source of information relating to obesity (and nutrition more generally), even over specialists such as dietitians (Ball et al. 2014). In a survey of Australian general practices, 78% patients (n=227) thought their GP did have a role to play in weight management and 78% were also keen on regular review with their GP (Tan et al. 2006). Internationally the role for GPs as a respected information source regarding nutrition and obesity care has been recognised for decades (Hiddink et al. 1997).

Lack of time is often quoted as a barrier to the involvement of GPs in obesity care. Yet there has been no added benefit of longer periods of consultation when assisting patients to change other health behaviours such as alcohol intake (Kaner et al. 2007). This discourse around time does not

recognise the journey that a GP takes with their patient, with each consultation a drop in the total time spent with the person over a lifetime (Gray et al. 2003).

For patients who want to work with their GP to manage their weight, there are few Australian resources. Primary Health Networks (PHNs) provide some programs to manage people with chronic conditions but most require a patient to have a co-morbidity, and are not delivered within the general practice setting. The Heart Foundation, in conjunction with PHNs and other partners, has piloted "Heartlink" which aims to reduce patient's cardiovascular risk but the program did not involve the patient's GP other than referral (Volker et al. 2014).

PERSON-CENTREDNESS

A core tenet of general practice is that care should be person-centred (Kidd 2013). Person-centredness is treatment that takes into account the target health issue as well as co-morbidities and social circumstances that may impact on the person. The patient's values and desires for their health remain central to any defined treatment or management process (Starfield 2011). The person-centred approach to obesity care is not mentioned in methodology for current interventions based in primary care (Wadden et al. 2014) and thus interventions may not be harnessing the power of this fundamental part of good general practice care. A person-centred approach that is offered as part of quality general practice care will provide a respectful environment for the issues surrounding obesity to be discussed and managed.

As part of person-centredness, GPs determine the priority and timing for any intervention for obesity (Stange 2009b). Patients often present with multiple reasons for a consultation and few have only a single issue that is impacting on their health (Britt et al. 2014). The GP needs to be able to consider all aspects of a patient's situation to prioritise the most pressing health need. Other considerations such as family influences, health priorities and social circumstances may rightly impact on a GP's decision to explore obesity management in a consultation (Stange 2009b). In the interests of excellent patient care there are times when a GP should not address obesity in a consultation, for example acute distress or illness, but instead should include it is part of an ongoing management plan.

EXPERT GENERALISM

The defining feature of an expert generalist is their ability to provide whole-person care and to do this in a context of person-centredness (Reeve et al. 2013). This translates to being a health practitioner who can manage all health concerns no matter what body system is affected, whilst taking into account the wishes and values of the person at the centre of the management plan (Reeve et al. 2013).

For the successful management of obesity three specific areas need to be targeted: nutrition, physical activity and behavioural interventions (National Health and Medical Research Council 2013). A GP has modest training in all three areas and can manage obesity in the context of other health conditions and behaviours – for example smoking, alcohol use and a high stress lifestyle. GPs also demonstrate good attitudes towards continuing education in these areas (Crowley et al. 2015). They can leverage change in one area to assist the patient to change in the areas of nutrition and physical activity. The methods used to assist with behaviour change in obesity are already employed with good effect by GPs in other related areas such as smoking cessation and alcohol use (Kaner et al. 2007; Stead et al. 2013).

A tailored management plan for obesity should be coordinated, taking into account co-morbidities, mental health conditions and the person's social context. The generalist is in the best position to do this. Fragmentation of care has been recognised as a burden when looking at disease states requiring tertiary care (Stange 2009a). Similarly benefits for the patient may potentially be lost if different "parts of obesity" are managed in a fragmented way. The current NHMRC guidelines for management of obesity bypass the expert generalism offered by GPs utilising them solely as "screeners" and "referrers" to more fragmented and less available allied healthcare. The impact of being cared for by an expert generalist is rarely explored within the context of obesity management. This may be a "missing link" in attempts to develop innovative strategies for obesity management in primary care.

OBESOGENIC ENVIRONMENT – PUBLIC HEALTH PARTNERSHIP

All health conditions, including obesity, are influenced by the patient's social determinants of health that are in turn affected by factors specific to the community in which they live (van Weel et al. 2008). This reality requires community awareness and action on the part of GPs. GPs can work alongside public health initiatives to support environments that improve individuals' health status.

Recognition of the “obesogenic environment” is essential in understanding the barriers to weight management (Swinburn et al. 1999). A good example of the interaction between general practice and public health is the success of smoking cessation. GPs increased individual management of patients to help them stop smoking, but also strongly advocated and supported public health interventions. Currently there are disincentives for patients to eat healthily and be physically active, leaving the individual to contend with their environment without the aid of a strong public policy framework to contain obesity.

Too often GPs are pursuing prevention while society is full of counter-incentives – like the obesogenic environment (Swinburn et al. 1999). This is a GP leadership issue as environments that support healthy lifestyles make individual interventions more feasible and effective when they are super-imposed on population directed public health action. GPs must continue to look beyond the consultation room to the community their patients live in. Utilising their leadership skills GPs can advocate for change in public health policies and legislation so that patients find the easiest choice to make is also the one that is best for their health.

CONCLUSION

GPs require resources to support their patients with obesity in their day to day clinical practice. This will enable them to refer to other health service providers only those patients who require a higher level of intervention when this is in line with the patient’s wishes for treatment. This will allow those patients most in need of allied health and specialist services the greatest time and support from these professionals. The expert generalism of GPs can be better used to manage patients with obesity in a holistic, person-centred manner. GPs can understand the person as a whole and recognise the barriers and motivators for individual patients to change their behaviour. GPs have a role at both the individual consultation level and in partnership with public health organisations in advocating for community environments that support healthy lifestyle behaviours.

References

Arai L, Panca M, Morris S, Curtis-Tyler K, Lucas P, Roberts H (2015) Time, monetary and other costs of participation in family-based child weight management interventions: qualitative and systematic review evidence. PLOS ONE 10(4), e0123782. 10.1371/journal.pone.0123782.

Australian Bureau of Statistics (2013) General Practitioners. In ‘Patient experiences in Australia: summary of findings 2012-13’. (Australian Bureau of Statistics: Canberra)

Ball L, Desbrow B, Leveritt M (2014) An exploration of individuals' preferences for nutrition care from Australian primary care health professionals. Aust J Prim Health 20(1), 113-120.

Britt H, Miller G, Henderson J, Bayram C, Harrison C, Valenti L, Wong C, Gordon J, Pollack A, Pan Y, Charles J (2014) General practice activity in Australia 2013–14. In 'General practice series no. 36'. (Sydney)

Chen L, Magliano DJ, Balkau B, Wolfe R, Brown L, Tonkin AM, Zimmet PZ, Shaw JE (2011) Maximising Efficiency and Cost-Effectiveness of Type 2 Diabetes Screening: The AusDiab Study. Diabetic Medicine 28(4), 414-423.

Crowley J, Ball L, McGill A, Buetow S, Arroll B, Leveritt M, Wall C (2015) New Zealand General Practitioners' views on providing nutrition care: a focus group study. Journal of Primary Health Care 2015, Article ID 259653.

Fildes A, Charlton J, Rudisill C, Littlejohns P, Prevost T, Gulliford MC (2015) Probability of an obese person attaining normal body weight: cohort study using electronic health records. American Journal of Public Health 105(9), e54-e59.

Foster MM, Cornwell PL, Fleming JM, Mitchell GK, Tweedy SM, Hart AL, Haines TP (2009) Better than nothing? Restrictions and realities of enhanced primary care for allied health practitioners. Australian Journal of Primary Health 15(4), 326-334.

Gray DP, Evans P, Sweeney K, Lings P, Seamark D, Seamark C, Dixon M, Bradley N. (2003) Towards a theory of continuity of care. Journal of the Royal Society of Medicine 96(4), 160–166.

Harris MF and Zwar NA (2007) Care of patients with chronic disease: the challenge for general practice. MJA 187, 104-107.

Hiddink GJ, Hautvast JG, van Woerku CM, Fieren CJ, van't Hof MA (1997) Consumers' expectations about nutrition guidance: the importance of primary care physicians. Am J Clin Nutr 65(Supplement 6), 1974S-79S.

Kaner EFS, Dickinson HO, Beyer FR, Campbell F, Schlesinger C, Heather N, Saunders JB, Burnand B, Pienaar ED (2007) Effectiveness of brief alcohol interventions in primary care populations. Cochrane Database of Systematic Reviews, Issue 2. Art. No.: CD004148. DOI: 10.1002/14651858.CD004148.pub3.

Kidd M (2013) Meeting people's health needs. In 'The contribution of family medicine to improving health systems: a guidebook from the World Organization of Family Doctors'. Pp. 1-13. (Radcliffe Publishing: London)

Mathus-Vliegen L and Toouli N (2011) 'World Gastroenterology Organisation Global Guideline: Obesity.' (World Gastroenterology Organisation) Available at http://www.worldgastroenterology.org/UserFiles/file/guidelines/obesity-english-2011.pdf [Verified 10 June 2016]

McRae IS, Yen L, Gillespie J, Douglas K (2011) Patient affiliation with GPs in Australia--who is and who is not and does it matter? Health Policy 103(1), 16-23.

National Health and Medical Research Council (2013). Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia. (National Health and Medical Research Council: Melbourne)

National Rural Health Alliance (2004) Under pressure and under-valued: allied health professionals in rural and remote areas. (National Rural Health Alliance) Available at http://ruralhealth.org.au/sites/default/files/position-papers/position-paper-04-11-05.pdf [Verified 10 June 2016]

New Zealand Guidelines Group (2012). New Zealand Primary Care Handbook 2012. (New Zealand Guidelines Group: Wellington)

Pearce-Brown CL, Grealish L, McRae IS, Douglas KA, Yen LE, Wells RW, Wareham S (2011) A local study of costs for private allied health in Australian primary health care: variability and policy implications. Australian Journal of Primary Health 17, 131-134.

Reeve J, Blakeman T, Freeman GK, Green LA, James PA, Lucassen P, Martin CM, Sturmberg JP and van Weel C (2013) Generalist solutions to complex problems: generating practice-based evidence - the example of managing multi-morbidity. BMC Family Practice 14, 112, DOI: 10.1186/1471-2296-14-112.

Stange, KC (2009) The problem of fragmentation and the need for integrative solutions. Ann Fam Med 7(2), 100-103.

Stange, KC (2009) A science of connectedness. Ann Fam Med 7(5), 387-395.

Starfield, B. (2011) Is patient-centred care the same as person-focused care? The Permanente Journal 15(2), 63-69.

Stead L F, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J, Lancaster T (2013) Physician advice for smoking cessation. Cochrane Database of Systematic Reviews 5.
Swinburn, B., G. Egger and F. Raza (1999). "Dissecting Obesogenic Environments: The Development and Application of a Framework for Identifying and Prioritizing Environmental Interventions for Obesity." Preventive Medicine 29(6), 563-570.

Tan D, Zwar N, Dennis S, Vagholkar S (2006) Weight management in general practice: what do patients want? MJA 185(2), 73-76.

van Weel C, Hiddink G, van Binsbergen J, Brotons C, Drenthen T, Green L, Halsted C, Koelen M, Kok F, Mathus-Vliegen E, Ockhuizen T, Truswell A (2008) The Fifth International Heelsum Workshop 'more synergy between primary care and public health': mission statement. Family Practice 25(Supplement 1), i6-i6.

Volker N, Clancy T, Cochrane T, Davey R.(2014) HeartLink Final Report. (University of Canberra, Centre for Research and Action in Public Health)

Wadden TA, Butryn ML, Hong PS, Tsai AG (2014) Behavioral treatment of obesity in patients encountered in primary care settings: a systematic review. JAMA 312(17), 1779-1791.

Chapter 2c)

Summary: The role of the general practitioner in adult obesity management

As shown in the scoping review, most interventions for the management of adult patients with obesity are developed in the USA. Despite the exponential increase in the number of interventions trialed, GPs are not often used as part of the team providing care to patients and are mostly used as a source for recruitment or referral. This approach seems at odds with the holistic role that is ascribed to GPs in many obesity guidelines and clinical overviews. It is possible that the translation of research from the USA has a different meaning in the Australian healthcare context where we are fortunate to have a stronger primary healthcare system.

The narrative review explored the strengths of general practice including person-centredness and expert generalism. Both of these qualities theoretically provide a strong basis for adult obesity management that is increasingly recognised as a chronic disease requiring holistic, person-centred care. This doctoral work seeks to understand more about the role of the GP in obesity care through the development and feasibility testing of a GP-delivered weight management program in Australian general practice.

Chapter 3

Structure and theoretical underpinnings for the development of a general practitioner-delivered weight management program

The remainder of this thesis follows the development of The Change Program, a weight management program for Australian general practice. As mentioned in Chapter 1, the research questions for this work are:

1. If a patient presents requesting their GP's assistance with weight management, is it acceptable and feasible for the GP to manage their care?
2. If a patient has a weight related issue, and there are no allied health services available to the patient due to either cost or location, is it feasible for the GP to assist with weight management?

This chapter will outline the overall aims and the methodological framework that guided the intervention development.

Aims

Chapters 3 through 9 will aim to:

- To develop a weight management program for adults living with obesity that can be delivered by general practitioners in their rooms.
- To assess the feasibility and acceptability of the weight management program to both patients and GPs.

To achieve these aims, this research was guided by the United Kingdom's Medical Research Council's (MRC) guideline[1] for the development and evaluation of complex interventions. A complex intervention is one that has more than one effective component, where implementation is context dependent, and the outcomes of interest are temporally displaced from the intervention itself.[1] Weight management programs for obesity in general practice are clearly complex interventions as they contain more than one component (e.g. provider behaviour, practice systems, tools for the intevention), implementation is reliant on the specific context of the intervention, and the outcomes are seen over an extended time period. These factors make complex interventions difficult to evaluate[2] and well-defined processes for their development lead to a greater chance of success.[1]

Outline

The MRC guideline recognises four key elements that are required to appropriately develop a new complex intervention (Figure 1).[1] This thesis is structured around the first two elements of the guideline – development; and, feasibility/piloting. This thesis concludes with an evaluation of the feasibility of the intervention, and does not go onto the evaluation or implementation phase. Prior to an implementation phase a trial for effectiveness would be required and options for trial design are discussed in Chapter 9.

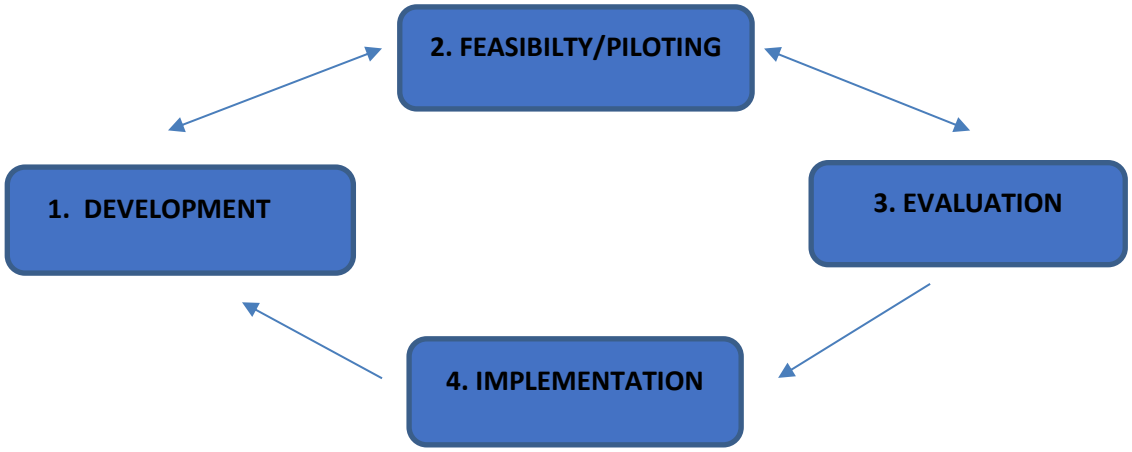

Figure 1 - The four key elements for developing and evaluating a complex intervention from the UK Medical Research Council's Developing and evaluating complex interventions: new guidance.[3]

1. <u>Developing a complex intervention:</u>

Prior to this doctoral work, five Australian national guidelines were reviewed and synthesied as the first step in developing this complex intervention.[4] Guidelines that were relevant to general practice at a national level were selected and then analysed for themes related to obesity management in general practice. Using the AGREE II tool,[5] three GP reviewers evaluated the guidelines and found the National Health and Medical Research Council Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults, Adolescents and Children in Australia[6] to be of the highest quality and best reported. This guidelines synthesis was then used to develop the draft weight management program.

Table 1 – Five Australian guidelines examined and synthesised prior to the intervention development[4]

NHMRC Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults, Adolescents and Children in Australia (2013)
National Heart Foundation's Physical activity and energy balance (2007)
RACGP's Guidelines for preventive activities in general practice ('Red book') (2012)
RACGP's National guide to a preventive health assessment for Aboriginal and Torres Strait Islander People (2012)
RACGP and Diabetes Australia's General practice management of type 2 diabetes – 2014–15

RACGP – Royal Australian College of General Practitioners; NHRMC - National Health and Medical Research Council

In developing the intervention, we used theory to guide knowledge translation, as well as theory related to behaviour change.

Knowledge to Action framework

The Knowledge to Action (KTA) framework was developed to improve the translation of evidence into best clinical practice.[7] The framework was developed in Canada in 2006 and was informed by 31 planned action theories from interdisciplinary and nursing fields.[8] The framework is not intended to be a "recipe" for knowledge translation, but as a guide with suggestions for improving implementation practice. As shown in Figure 2, the framework has a central Knowledge Creation funnel, surrounded by a cyclical Action Cycle.[7] Each part of the framework can be used iteratively, informed by feedback from the participants as the cycle continues. The KTA framework was used to guide the intervention development study that is reported in Chapter 4.

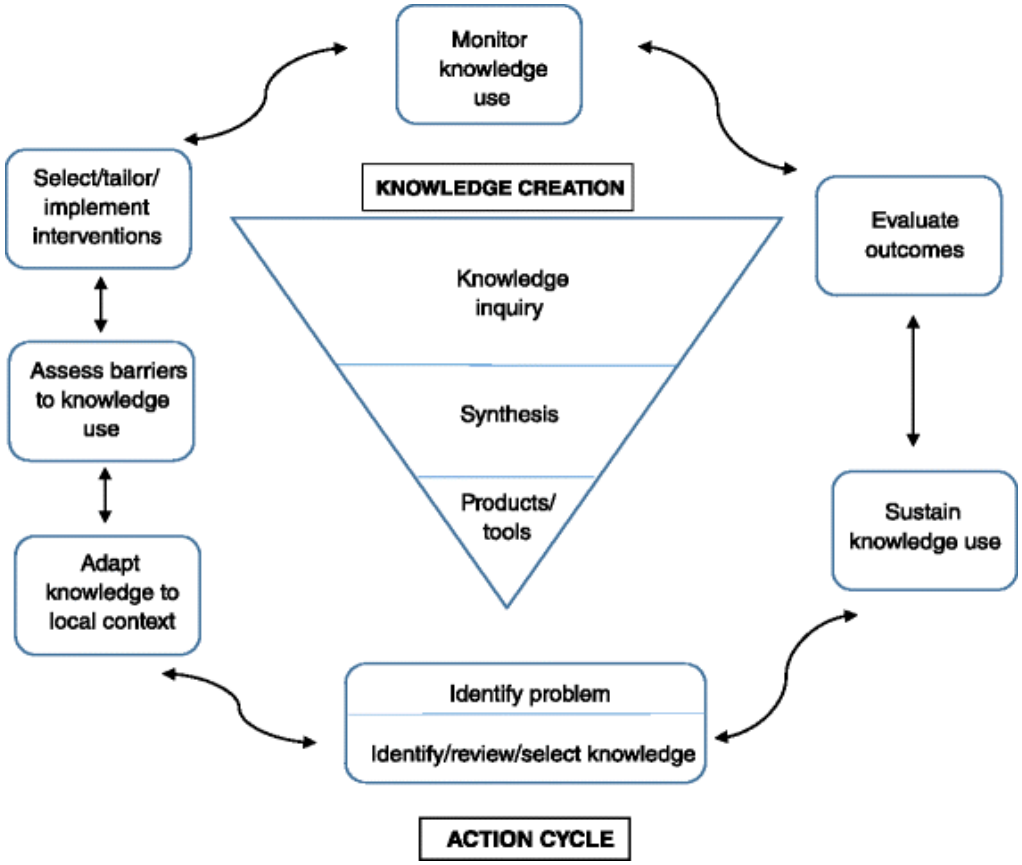

Figure 2 - Knowledge To Action diagram. This diagram depicts the phases of the KTA framework with components of the "Action Cycle" in *rectangles* surrounding the "Knowledge Creation" funnel in a *triangle*. Adapted from Graham, I.D., et al.[7]

5As for behaviour change

The "5As" of behaviour change is a mid-level theory that is based on the transtheoretical model of behaviour change.[9] The original theory from Prochaska and Diclemente describes the different stages of motivation that individuals can pass through when thinking about behaviour change and it has been applied extensively to health behaviours like smoking.[9] Using the Transtheoretical model, the 5As was developed by the United States Preventative Task Force Agency as a framework for practitioners to work with patients on smoking cessation.[10] It is presented as a stepwise process from Ask, Assess, Advise, Assist/Agree, Arrange, with some differences in the verbs that are applied in Australia and North America.

The 5As model has been applied to obesity management and is used extensively to both develop models of care, and to evaluate consultations in the primary care setting.[11-13] The 5As was used to inform the development of the weight intervention as described in Chapter 4. It was also used to evaluate the GPs' experiences of using the weight management program in a quantitative survey with results described in Chapter 6. A possible adaptation of the 5As for behaviour change is

discussed in Chapter 7 to more comprehensively represent person-centred care, continuity of care, and the therapeutic alliance between a family doctor and patient.

2. Assessing feasibility

The acceptability and feasibility of the weight management program were explored in a mixed methods feasibility study. This is described in detail in Chapter 5.

The MRC guideline for complex intervention development[2] encourage the consideration of how and why change occurs in the intervention. Using a theoretically informed approach, this doctoral work considered a number of processes that influenced whether the weight management program was effective for patients in the feasibility trial.

Normalisation Process Theory

Normalisation Process Theory (NPT) is a mid-level theory that was developed by a sociologist working with an interdisciplinary team in the UK.[14] NPT is based on the premise that a successful intervention is one that can be implemented and embedded into everyday practice.[14] The four components described by NPT for successful implementation are:

1. Coherence – the ability of the individual practitioner to understand the new way of working. It is composed of four different subsections: differentiation, communal specification, individual specification, internalisation.

2. Cognitive Participation – the way the individual practitioner integrates the new practice into their everyday work for sustainability. The subsections here are: initiation, enrolment, legitimation, activation.

3. Collective Action – the way the individual practitioner operationalises the new way of working, and in particular, the processes that they use. The subsections here are: interactional workability, relational integration, skill set workability, contextual integration.

4. Reflexive monitoring – the way the individual practitioner understands the new work's impact on themselves and those around them. The subsections here are: systematisation, communal appraisal, individual appraisal, reconfiguration.[14]

NPT is used in Chapter 5 as a tool for assessing the implementation of a new weight management program in a feasibility study in Australian general practice.

Therapeutic alliance

In 1979 the contemporary psychologist Bordin published his seminal paper on what he termed the "working alliance".[15] According to this theory, there are three components of the therapeutic alliance, that is:

1. Bond – the warm and respectful partnership between a practitioner and client;
2. Goals – the ability of the dyad to collaborate on goal setting; and,
3. Tasks – the mutual understanding of what needs to occur to reach the goals.[15]

Each of these three factors has to be strong for a good working alliance. Bordin's paper highlighted the alliance between a psychologist and their client, but he also described the alliance as essential to any helping relationship, be it a "student and teacher, between community action group and leader, and, with only slight extension, between child and parent".[15] Bordin's theory was used to develop a tool to measure the working alliance in psychological practice – the Working Alliance Inventory.[16] In Chapter 8, Bordin's conceptualisation of the therapeutic alliance is applied to the feasibility study using the Working Alliance Inventory.

Self-efficacy theory

Self-efficacy was described by Bandura to be "an individual's belief in his or her capacity to execute behaviours necessary to produce specific performance attainments".[17] It forms part of his overarching Social Cognitive Theory which seeks to describe the factors that influence a person's motivation and behaviours.[18] In Bandura's theory, a person's self-efficacy is shaped by four factors:

1. Vicarious experiences – if an individual sees someone that they feel they can relate to performing a task well, this influences their self-efficacy in a positive way;
2. Physiological feedback – an individual's bodily reaction to a situation can influence their self-efficacy. For example, the bodily experience of adrenaline release from the autonomous nervous system includes heart palpitations and feeling sweaty, and this experience can have a negative impact on sense of self-efficacy for the task they were undertaking at the time;
3. Verbal persuasion – when a person is verbally encouraged in their performance of a task, this can have a positive effect on their self-efficacy;

4. Performance experiences – when a person undertakes a task and their actions result in the outcome they were aiming for, this has a positive impact on their self-efficacy. Performance mastery is the most influential factor in a person's self-efficacy for a task.[17]

Bandura's self-efficacy theory is frequently applied to situations where a patient is trying to change their lifestyle or health related behaviours. In Chapter 6 we describe how this theory helped to inform the analysis of GP self-efficacy in relation to obesity management in primary care.

References

1. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ 2008;337 doi: 10.1136/bmj.a1655.
2. Clark AM. What are the components of complex interventions in healthcare? Theorizing approaches to parts, powers and the whole intervention. *Social Science & Medicine* 2013; **93**(Supplement C): 185-93.
3. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: new guidance. UK: UK Medical Research Council, 2006.
4. Sturgiss E, Douglas K, Kathage R, et al. A synthesis of selected national Australian guidelines on the general practice management of adult patients who are overweight or obese. Aust Fam Physician 2016;45(5):327-31
5. Brouwers MC, Kho ME, Browman GP, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. CMAJ : Canadian Medical Association Journal 2010;182(18):E839-E42 doi: 10.1503/cmaj.090449.
6. Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia. Melbourne: National Health and Medical Research Council, 2013.
7. Graham ID, Logan J, Harrison MB, et al. Lost in knowledge translation: time for a map? The Journal of Continuing Education in the Health Professions 2006;26(1):13-24 doi: 10.1002/chp.47.
8. Field B, Booth A, Ilott I, et al. Using the Knowledge to Action Framework in practice: a citation analysis and systematic review. Implementation Science 2014;9(1):172 doi: 10.1186/s13012-014-0172-2.
9. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. Journal of Consulting and Clinical Psychology 1983;51(3):390-5
10. Tobacco Use and Dependence Guideline Panel. Treating Tobacco Use and Dependence: 2008 Update. Rockville (MD): US Department of Health and Human Services, 2008.
11. Campbell-Scherer DL, Asselin J, Osunlana AM, et al. Implementation and evaluation of the 5As framework of obesity management in primary care: design of the 5As Team (5AsT) randomized control trial. Implementation Science 2014;9:78 doi: 10.1186/1748-5908-9-78.
12. Vallis M, Piccinini–Vallis H, Sharma AM, et al. Modified 5 As. Minimal intervention for obesity counseling in primary care. Canadian Family Physician 2013;59(1):27-31
13. Jay M, Gillespie C, Schlair S, et al. Physicians' use of the 5As in counseling obese patients: is the quality of counseling associated with patients' motivation and intention to lose weight? BMC Health Services Research 2010;10:159-59 doi: 10.1186/1472-6963-10-159.
14. Finch TL, Rapley T, Girling M, et al. Improving the normalization of complex interventions: measure development based on normalization process theory (NoMAD): study protocol. Implementation science : IS 2013;8:43 doi: 10.1186/1748-5908-8-43.

15. Bordin ES. The generalizability of the psychoanalytic concept of the working alliance. Psychotherapy: Theory, Research & Practice 1979;16(3):252-60 doi: 10.1037/h0085885.
16. Horvath AO, Greenberg LS. *The Working Alliance: Theory, Research, and Practice*: Wiley, 1994.
17. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychological review 1977;84(2):191-215
18. Bandura A. Social cognitive theory: an agentic perspective. Annual Review of Psychology 2001;52:1-26 doi: 10.1146/annurev.psych.52.1.1.

Chapter 4

A collaborative process for developing a weight management toolkit for general practitioners in Australia—an intervention development study using the Knowledge To Action framework

Reference: Sturgiss E, Douglas K. A collaborative process for developing a weight management toolkit for general practitioners in Australia—an intervention development study using the Knowledge To Action framework. Pilot and Feasibility Studies 2016;2:20 doi: 10.1186/s40814-016-0060-4.

This intervention development study outlines the process used to create The Change Program using a Knowledge to Action approach. The KTA framework has been used extensively in the development of guidelines. As described in this paper, KTA can be used to draw on the expertise of people working in the field to iteratively develop a new body of knowledge and/or a way to apply the knowledge in practice. This intervention development study describes the qualitative process used to develop the final weight management resources, The Change Program. These resources were then used by GPs and patients in the feasibility trial.

Sturgiss and Douglas *Pilot and Feasibility Studies* (2016) 2:20
DOI 10.1186/s40814-016-0060-4

Pilot and Feasibility Studies

METHODOLOGY Open Access

A collaborative process for developing a weight management toolkit for general practitioners in Australia—an intervention development study using the Knowledge To Action framework

Elizabeth Ann Sturgiss* and Kirsty Douglas

Abstract

Background: Obesity is commonly seen in the Australian general practice population; however, few resources are specifically targeted at GPs working with these patients. The National Health and Medical Research Council (Australia) guideline for managing patients who are overweight and obese supports the involvement of a regular health professional. As 85 % of the population visit a GP annually, resources to support GPs working with this patient population are needed.
This study describes the collaborative process used to develop an obesity management programme based on current Australian guidelines for GPs and their patients to be used in primary care. The Knowledge To Action framework was applied to develop a weight management toolkit for GPs based on current Australian guidelines. This draft was then reviewed by clinical GPs, GP registrars, consumer representatives and allied health professionals using focus groups and interviews. The participants gave feedback on the content, layout and acceptability of the documents. The feedback from the stakeholder groups was evaluated, and changes were incorporated into the final documents. A graphic designer was contracted to assist with the layout to improve useability and attractiveness of the documents.

Results: A total of 38 participants gave feedback on the draft weight management programme, and the research team amalgamated their responses to further improve the documents. The general response from GPs and consumer representatives was positive with most conveying their wish to try the programme themselves.

Conclusions: "The Change Program" is a practical tool for Australian GPs to use with their patients who are overweight or obese. It was developed in collaboration with GPs, allied health professionals and consumer stakeholders based on current Australian guidelines. It is currently being piloted in five general practices.

Keywords: Obesity, Family practice, Health promotion, Knowledge To Action

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Background

An increasing proportion of patients who see GPs are overweight or obese [1, 2], and there are currently no weight management programmes that can be delivered solely by a GP in primary care in Australia [3]. Lifestyle interventions to reduce weight in primary care have had varying degrees of success in the first 12 months with most showing a return to previous weight after that time [4–7]. There are few primary care interventions that involve a family doctor [8], and most require referral to an outside practitioner or lifestyle coach. There is some evidence that patients who are satisfied that their primary care practitioner is involved in the weight loss intervention lose more weight [9]. In Australia, it is recognised that as the number of people who are obese increases, we need good tools to support GPs as the first point of contact in the healthcare system [3].

Australian guidelines suggest that GPs should be involved in identifying patients, assessing their health risk and then referring to a multidisciplinary team as needed whilst acting as a care co-ordinator [10]. It is suggested that GPs put together a management plan for their patients but there is minimal direction as to the exact content of such a plan. The guidelines focus on three areas [10]: nutrition, physical activity and behavioural interventions. We have previously published our findings from synthesising and amalgamating the recommendations from current guidelines [11].

Patients are keen for their GP to be involved in both weight management [12] and giving nutrition advice [13]. Despite this information from patients, there are few weight management interventions that involve the GP in the actual intervention. For patients that wish to work with their GP on weight management, there are few resources to guide them and there are no specific programmes. Patients may be unable to access multidisciplinary care for a variety of reasons—cost [14], availability and preference [12]. As obesity affects more people within a population, it is important to have as many options available for patient choice as possible.

This intervention development study [15] describes the method and outcome of the collaborative process we used to develop an obesity management programme based on current Australian guidelines for GPs and their patients to be used in primary care. A weight management programme gives suggestions to the GP as to how often they should see their patient, the appropriate content of consultations and direction for areas to be discussed with the patient.

Our process was informed by Fransen et al. [16] in their development of a minimal intervention strategy for primary care patients in The Netherlands. Guided by the Knowledge To Action (KTA) framework [17], we developed programme materials using principles of co-creation with stakeholders. The KTA is a knowledge exchange framework that assists in ensuring guidelines are relevant to local organisational and cultural conditions. The aim of the framework is to reduce the gap between the evidence base and clinical practice by making guidelines and resources that are produced in a collaborative fashion with end users and other interested parties. The framework has two main parts: initially, the "knowledge funnel" is used to collate current expertise into a usable form such as guidelines, and then the "action cycles" are used in an iterative process to ensure the knowledge is relevant and practical to the local context. The framework is a cyclical one, best described by the diagram from the original work by Graham et al. (see Fig. 1) [18].

Our aim is to provide GPs with evidence-based weight management resources to be used with their patients in primary care. By describing the process of developing this complex intervention, we hope to assist others who are planning similar interventions in general practice which aligns with the principles of dissemination outlined in the Medical Research Council's guidelines for developing complex interventions [19]. We also discuss the utility of the KTA framework to develop tools to be used in the clinical decision space based on recommended guidelines.

Methods

The knowledge enquiry and synthesis phase of the KTA framework involved four clinical GPs synthesising selected Australia current guidelines [11]. This synthesis resulted in the development of an initial draft that included a GP handbook as well as a patient workbook (see Table 1). The patient workbook was developed based on self-management principles which aim to enhance a person's ability to care for themselves and thereby reduce the consequences of living with a chronic condition [20]. All patient worksheets were written to maximise readability. We used the Simple Measure of Gobbledygook (SMOG) [21] readability index and aimed for a SMOG of 8 (equivalent to a grade 6 standard of reading) wherever possible.

The three action phases of the KTA framework (adapt knowledge to local context, assess barriers/supports to knowledge use, tailor intervention) were then undertaken using qualitative methodologies. Our participants included:

- General practitioners
- Training GP registrars
- Consumer representatives who are trained volunteers who aim to promote the consumer (patient) voice within the healthcare system
- Representative bodies for chronic illness which are advocacy and research organisations that aim to reduce the impact of the specific disease that they represent

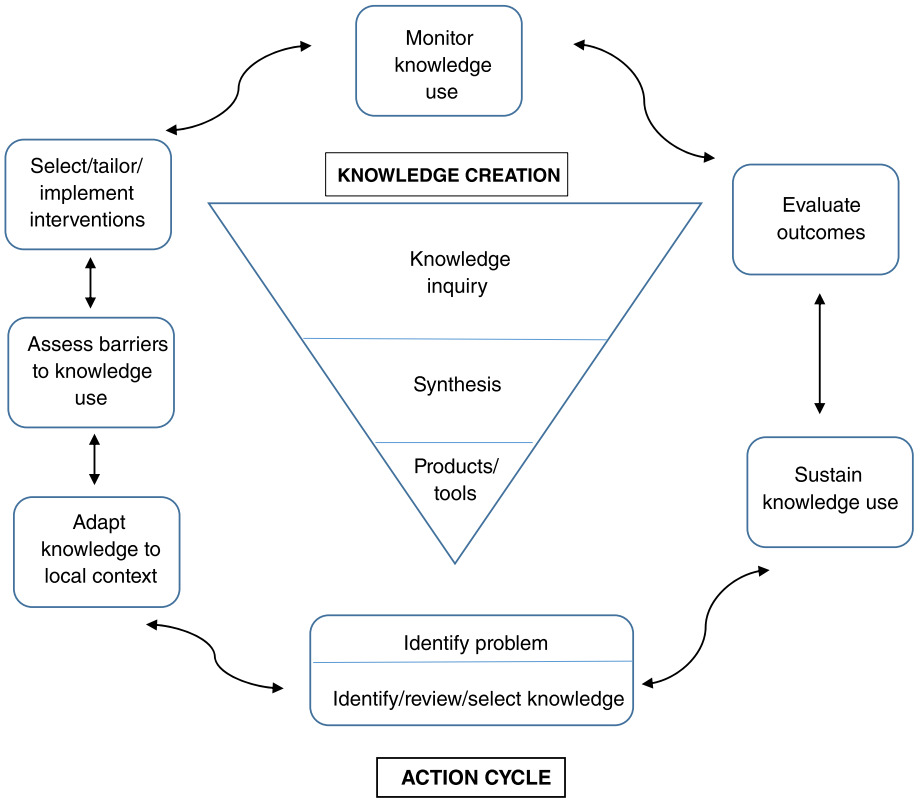

Fig. 1 Knowledge To Action diagram. This diagram depicts the phases of the KTA framework with the "action cycles" in *rectangles* surrounding the "knowledge creation" phase in a *triangle*. Adapted from Graham, I.D., et al. [18]

– Allied health professionals including dieticians and psychologists

We used purposive sampling and continued to interview both GPs and consumer representatives until no new issues were raised. To recruit a diverse sample of participants, we contacted GPs through a number of avenues: via the Australian Capital Territory Medicare Local (primary health network group), through Practice-Based Research Network contacts, at local GP grand round events and convenience sampling via colleague networks. Consumer representatives were contacted via the Health Care Consumers' Association in our local region. The Association used their regular processes for asking their members to give us feedback. We also contacted relevant representative bodies for chronic illnesses associated with obesity in our local region. These organisations were asked to comment on the documents with reference to their particular area of expertise.

Three investigators who are all clinical GPs with BMI 20–25 acted as interviewers, and an outline of the topics that were discussed is given in Table 2. The investigators asked the participants to look through the books, to give feedback freely as they went and also directed particular comment on certain sections (see Table 2). Only one investigator attended each interview/focus group for approximately 1 hour in all instances. All the participants were interviewed at their place of work or at a venue that they most preferred.

All groups reviewed both the patient and GP books, except for the consumer representatives who reviewed only the patient workbook. The participants were given the books at the start of the session, apart from the allied health representatives who had access to the material prior to the interview for a detailed review. Some feedback was audiotaped and transcribed, and others had detailed notes and writings on the actual research materials. This distinction was dependent on the wishes of the participant and the noise levels at the location of the interview.

During the interviews and focus groups, the interviewers checked understanding with the participants by summarising points raised and checking for accuracy. After each interview or focus group, the research team met to review the data that was collected. Data from transcriptions was analysed for themes. At any point where there was new feedback, or a feedback that was opposite to the previous feedback, the research team

Table 1 Contents of the GP handbook and patient workbook

GP handbook:
1. Welcome
2. Who is this programme for?
3. Work up
4. Why is it so hard to lose weight?
5. Nutrition
6. Physical activity
7. Behavioural interventions to support weight loss
8. Trouble shooting and communication
9. Medical causes for obesity
Patient workbook:
1. Welcome
2. Upcoming appointments
3. Goal setting
4. Measurements
5. Nutrition
6. Physical activity
7. Behavioural supports
8. Physical activity diary
9. Nutrition diary
10. Relapse prevention

Table 2 Outline of feedback sought from GP and consumer representatives

Consumer feedback
1. Logistics including frequency of suggested appointments
2. Layout and name
3. Graphics and presentation
4. Goal setting page
a. Is the language appropriate?
b. Is it clear how to use the goal setting?
5. Overall impression
a. Would you like to try it?
General practitioner feedback
1. Logistics and information
a. Time commitment
b. Frequency of appointments
c. Is there information you would like that is missing?
d. Would you like an education programme that is aligned with this programme?
2. Layout
3. Graphics
4. Indexing
a. Any obvious things missing from the index
5. Overall impression
a. Would you like to try it?

discussed how to incorporate it based on current guidelines. The graphic designer was asked to incorporate all the suggested changes from the participants. Finally, the documents were reviewed by a local psychologist with a special interest in obesity care as well as by a local dietician to ensure the information provided was accurate and complete.

This study was approved by the Australian National University Human Research Ethics Committee protocol number 2014/055, and the participants signed the consent forms prior to giving their feedback.

Results

A total of 38 participants gave feedback on the programme materials, and the details of the participants are given in Table 3.

Knowledge creation

The contents of each of the books are outlined in Table 1. Building on the recommendations of Fransen et al. [16], we involved a graphic designer early in the process to ensure that the layout and useability of the documents were maximised. The name of the programme, "The Change Program", was developed by the four clinical GPs. The team wanted a name that sounded hopeful, did not overly emphasise weight and built an idea that "lifestyle change" was needed for better outcomes.

Recruitment process

Recruitment for this research proceeded smoothly and easily. For the GPs, recruitment was most successful via email through the general practice academic unit of the medical school. This was more successful than newsletter invitations or promotion at grand round meetings. The GP registrars were approached via email on two occasions and were asked to volunteer to attend their training day early to give feedback. The recruitment of consumer representatives occurred with only one email to the Health Care Consumers' Association who then instigated their usual processes for asking their volunteers to be involved. This ease of recruitment reflects the genuine interest in the management of obesity in primary care in our local community. A few of the participants from each of the stakeholder groups have remained part of our research and now sit on our research advisory committee.

Action phases

A majority of participants thought the programme looked useable at face value.

Table 3 Details of participants

Participant	Form of feedback	Total number
General practitioner	One-on-one interview	4
GP registrar	Focus group	1 group with 14 attendees
General practitioner	Focus group	3 groups (3 GPs, 4 GPs, 4 GPs)
Healthcare consumer representative	One-on-one interview	5
Representative bodies for chronic illness	One-on-one interview	2
Dietician	One-on-one interview	1
Psychologist	One-on-one interview	1
		Total—38

> …this is a great idea, and I think the GP's need to be more involved in the whole conversation about weight loss, 'cause I think in a lot of cases it's something that it's too delicate, and what do I say, and what if they get upset, and so nothing is said. (Representative body 1)

This was especially so in the GP and GP trainee groups with most asking if they could keep a copy of the programme materials after their interview.

> I think having something substantial that you can give to patients is a really good idea [discussing patient handbook] (GP registrar)

Assess barriers/supports to knowledge use

The GPs all stated that they would want an interface that interacted with their computer software.

> That's always handy, if simply on the screen, 'cause you look at them and then you do the things with the patient and then you fill in your notes afterwards. And that's really great. (GP registrar)

Based on this feedback, we developed a template that could be adapted for the different programmes used in our region. This provided a place to record appointment information and gave the GP prompts for factsheets to refer the patient to in their workbook.

None of the GPs interviewed wanted an education programme associated with the toolkit.

> Would you like an education program that is aligned with this program's delivery?
>
> Not sure we would go. Isn't that the point of the workbook? (self-explanatory) (GP)

They described feeling overwhelmed at times with the number of education events they were invited to participate in. They wanted a set of resources that could be referred to as needed, and they felt that there was enough information in the handbook for them to be able to assist a patient.

None of the consumer representatives thought that the programme looked like an unworkable idea. There were some concerns about the logistics of the programme including cost (both monetary and time) to the patient and the feasibility of implementing it within general practice.

> – wonders about practicalities i.e. would it be practical to get into their GP that often? (consumer rep 1)
> – thinks will depend upon flexibility of the GP and wonders how likely is it that the GP will invest the time or whether it would be sustainable for the GP and wonders if there would be implications if program not followed (consumer rep 2)
> Field notes from the interviewer

The stakeholder representatives were not as positive about the programme. There was concern that GPs would not be able to implement the programme, that GPs would lose focus on other important health condition management and that perhaps patients would not want to see their GP for this sort of advice.

> "Is it realistic to even think that people would use their GP as someone who would help them in their weight loss? Or would they be also looking at a dietician to do the same thing? Or a coach?" (Representative body 1)
>
> "And I'd be really concerned if that happened to my patients, that they be on a six to 12 month treatment programme to sort their obesity out and then no-one looked at their [chronic illness] in the meantime, and they were allowed to continue to have high blood sugars" (Representative body 2)

This feedback was quite opposite from what we saw from the GP and consumer participants.

> I love this book [patient handbook]. And if I had just this book it would change the way I practice I think, just to have a go to for… I like it a lot. (GP registrar)

Both the GPs and consumer participants were concerned about the cost to the patient.

> The GP's don't have a lot of time for things like this. So I'm just sort of wondering here what would that look like for the patient? Is this something that they would be paying for themselves? Or is this something

> that would be covered? Because I think it always seemed to come down to how expensive, how much is it going to cost for me to be able to do this? (Representative body 1)

Adapt knowledge to local context

One group of GPs who worked with a defined vulnerable population felt that the programme would not be helpful in their population and would need modification for their population group. If their population wanted to be involved in a programme like this, our team would offer to meet and tailor the programme as needed. From their experience working in general primary care, they thought it would be useful in that setting.

Some GPs felt that there was not enough prescriptive information in the programme and they would like more exact direction on how to structure each programme. Other GPs liked the "looser" nature of the set-up and felt that this allowed them to work with what they knew about their patient and their community. We took this on board and developed a consultation schedule that had suggested topics and actions for each visit. We had this in the front of the GP handbook should any practitioner feel they wanted this level of direction.

> The booklet's not forcing you to do all this at the same time or anything, it's just saying at… over a period of time. So you've got freedom as the GP to decide as you like. So if you judge the patient is really throwing this at them up front is just going to put a roadblock in the way straight away (GP registrar)

Tailor intervention

Most GPs wanted more nutrition information particularly relating calories eaten to the amount of physical activity needed to burn it off. This was added as a new factsheet in the patient workbook.

Some consumer representatives were worried that there was too much text and the layout was not appealing. This feedback was acted on; readability was re-evaluated, text boxes were added and more graphics were inserted.

- thinks "really good, crisp and clear"; thinks too dense (too much writing) and needs more breakout boxes and pictures (consumer rep 1)
- Too much information to take in – needs more pictures; Not much variation in colour or graphics; "Looks boring and overwhelming (consumer rep 2)

Field notes from the interviewer

> I like the idea though that everything is in the booklet format, this is their little bible that they can use. (Representative body 1)

The graphic designer was involved in making approximately ten different versions of the documents following the participants' feedback to incorporate the changes suggested. The final feedback on the draft was sought from a dietician and psychologist who both have a special interest and expertise in obesity. Both found that the information in the programme was correct for their discipline-specific background. The psychologist was particularly impressed at the detail around behavioural interventions as they usually find this is lacking in many current weight management programmes.

The dietician also felt that there was not enough nutrition information and was a little surprised at the focus on psychological interventions. They felt that we had a lot of information telling the patient what not to eat but not enough about good foods to eat. From this, we included examples of daily menus that were consistent with dietary guidelines.

The next step for "The Change Program" is a pilot implementation trial based on Normalisation Process Theory [22] to assess feasibility, useability and acceptability to both GPs and patients.

Discussion

By using a collaborative process such as this, we aim to produce a toolkit for weight management in primary care that is acceptable to both patients and GPs. Obesity is currently not being recognised and managed in primary care as much as guidelines would recommend [3]. If we increase the treatment choices available to patients and empower GPs with structured tools to be used, we can improve the likelihood that obesity will be managed within the primary care setting. As discussed previously, as GPs are the first point of contact with the health system, they have good reach into the community and need supportive tools for management [3].

Our data has shown a keen interest from GPs and consumer representatives on the role of GPs in managing obesity in primary care. Representatives from chronic illness organisations were less positive about the overall feasibility of such a weight management programme in general practice. They were reflecting from a perspective outside of the relationship between a GP and a patient using their experience in management. We have taken the views of the GPs and consumers as more reflective of the population likely to use the programme. Although it is possible that they were influenced to give positive answers as they were interviewed by GPs, it is unlikely that every person interviewed was similarly influenced and we received some negative feedback from GPs on aspects of the

programme that could be improved. This is an example of the importance of reaching for feedback from multiple sources especially those at the frontline to ensure their perspectives are not missed.

Involving a graphic designer from the beginning of the intervention development meant that our materials looked attractive and easy to use. We were able to use the skills of the graphic designer to incorporate changes when we had feedback about the layout of the materials. We would recommend working with a designer that is happy to work via email, is accessible and is responsive to changes suggested by your team.

The process for developing intervention studies is not described very often in the literature [15]. By outlining the details of the collaborative process we utilised, interested parties are able to trace the origins of the weight management toolkit and what stakeholders had input. It is also important for processes to be published so that other researchers can learn from our experience in developing this complex intervention. Through transparent reporting of development processes, it is possible that research waste can be reduced by stopping repetition of similar interventions or mistakes [15].

By starting with national guidelines for the management of patients who are overweight and obese in primary care [10], we have attempted to make our toolkit generalisable to the Australian context. The stakeholders involved in the action phases of our research were all drawn from our local region. The Australian Capital Territory (ACT) has a population that has a higher than average income compared to the rest of Australia. The ACT also has the lowest rate of "bulk-billing" for general practitioner services where the entire consultation cost is covered by the national health insurance [23]. It is possible that the feedback from our local region is not generalisable to a national level.

Using the KTA framework to describe the development of clinical practice guidelines is well established [24]. Our process informs a further use of the KTA framework where the knowledge creation process begins with identification of guidelines that are then synthesised. The initial knowledge creation process is completed with the development of tools that can be used in the clinical decision-making process. The action phases are used to strengthen and develop the tools prior to the implementation of the intervention. These initial action phases with feedback from relevant stakeholders allow for some problems with interventions to be identified prior to the pilot-testing phase and for further testing of interest in participants for the research project.

This co-creation with all relevant bodies and individuals encourages ownership and interest in the research project. Poor recruitment and response rates within research, especially of GPs, are often described with resultant research waste [25]. Strategies to improve recruitment and retention of GPs usually discuss methods of contact, incentivising and having a colleague send the invitation [26, 27]. However, co-creation with practitioners is not mentioned as a method for enhancing ownership, acceptance and support of research. Our method of co-creation with GPs involved in meaningful ways in early intervention development is likely to enhance recruitment and participation.

Conclusion

By involving multiple different stakeholder groups, we were able to produce programme materials for weight management in primary care to be used by GPs in consultation with their patients using a Knowledge To Action framework. This process led to multiple changes in our weight management materials including changes to layout for readability, more detailed information on nutrition and more explicit instructions for the frequency and content of appointments.

This programme supports increasing calls for increased general practice involvement in obesity management as the first point of call in the health system and having the greatest reach into the community. The interest of the primary care community and patients is testament to the ongoing research that is needed to better support GPs in their management role for this difficult health condition. These programme materials are now being used in an implementation pilot study in five general practices in the next step to assessing clinical effectiveness of such a programme.

Abbreviations

BMI: body mass index; GP: general practitioner; KTA: Knowledge To Action.

Competing interests

This work was funded by a research grant from the Royal Australian College of General Practitioners/Independent Practitioner Network Pty Ltd Research Grant. The funding body had no input into the design, collection or reporting of data.

Authors' contributions

ES and KD designed the study. ES was involved in the data collection. ES and KD were involved in the data interpretation. ES and KD were involved in re-designing the programme booklets. ES prepared the first version of the manuscript. ES and KD revised and approved the final manuscript.

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References

1. Overweight and obesity. 2013, Australian Institute of Health and Welfare: http://www.aihw.gov.au/overweight-and-obesity/.
2. Valenti L. Overweight and obesity. In: Britt H, Miller G, editors. General practice activity in Australia, priorities and policies 1998 to 2008. Canberra: AIHW; 2009.
3. Jansen SB, Desbrow L. Ball. Obesity management by general practitioners: the unavoidable necessity. Aust J Prim Health. 2015

4. Booth HP et al. Effectiveness of behavioural weight loss interventions delivered in a primary care setting: a systematic review and meta-analysis. Fam Pract. 2014;31(6):643–53.
5. Kushner RF, Ryan DH. Assessment and lifestyle management of patients with obesity: clinical recommendations from systematic reviews. Jama. 2014; 312(9):943–52.
6. Tsai AG, Wadden TA. Treatment of obesity in primary care practice in the United States: a systematic review. J Gen Intern Med. 2009;24(9):1073–9.
7. Wadden TA et al. Behavioral treatment of obesity in patients encountered in primary care settings: a systematic review. Jama. 2014;312(17):1779–91.
8. Martin P et al. A primary care weight management intervention for low-income African-American women. Obesity. 2006;14(8):1412–20.
9. Bennett WL et al. Satisfaction with primary care provider involvement is associated with greater weight loss: results from the practice-based POWER trial. Patient Educ Couns. 2015;98(9):1099–105.
10. National Health and Medical Research Council. Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia. Melbourne: National Health and Medical Research Council; 2013.
11. Sturgiss E, et al. Synthesis of selected national Australian guidelines on the management of adult patients who are overweight or obese in general practice. Australian Family Physician, 2015. Accepted for publication.
12. Tan D et al. Weight management in general practice: what do patients want? MJA. 2006;185(2):73–6.
13. Ball L et al. General practitioners can offer effective nutrition care to patients with lifestyle-related chronic disease. J Prim Health Care. 2013;5(1):59–69.
14. Pearce-Brown CL et al. A local study of costs for private allied health in Australian primary health care: variability and policy implications. Aust J Prim Health. 2011;17:131–4.
15. Hoddinott P. A new era for intervention development studies. Pilot and feasibility studies. 2015;1(1).
16. Fransen GA et al. The development of a minimal intervention strategy to address overweight and obesity in adult primary care patients in The Netherlands. Fam Pract. 2008;25 Suppl 1:i112–5.
17. Graham I, Tetroe J. The Knowledge To Action framework. In: Rycroft-Malone J, Bucknell T, editors. Models and frameworks for implementing evidence-based practice: linking evidence to action. Oxford: Wiley-Blackwell; 2010. p. 207–22.
18. Graham ID et al. Lost in knowledge translation: time for a map? J Contin Educ Health Prof. 2006;26(1):13–24.
19. Developing and evaluating complex interventions: new guidance. Craig P, et al. editors. London: Medical Research Council, 2006
20. Barlow J et al. Self-management approaches for people with chronic conditions: a review. Patient Educ Couns. 2002;48:177–87.
21. McLaughlin G. SMOG grading—a new readability formula. Journal of Reading, 1969. 639–46.
22. Mair CMTRF et al. Normalization process theory on-line users' manual, toolkit and NoMAD instrument. 2015.
23. National Health Performance Authority 2013, Healthy Communities: Australian's experiences with primary health care in 2010–11.
24. Field B et al. Using the Knowledge To Action framework in practice: a citation analysis and systematic review. Implement Sci. 2014;9:172.
25. McKinn S, et al. Recruiting general practitioners as participants for qualitative and experimental primary care studies in Australia. Aust J Prim Health. 2014.
26. Winona S, Vo T, Pyakurel S. The effectiveness of recruitment strategies on general practitioner's survey response rates—a systematic review. BMC Med Res Methodol. 2014;14:76.
27. Ngune I et al. Effective recruitment strategies in primary care research: a systematic review. Quality in Primary Care. 2012;20:115–23.

Chapter 5

Feasibility and acceptability of a physician delivered weight management programme

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The main aim of the six-month trial of The Change Program was to assess the feasibility and acceptability for both patients and GPs. We used concurrent triangulation mixed methods to assess feasibility and acceptability, guided by Normalisation Process Theory.

Eligible patients were those aged over 18 years, with a Body Mass Index of over 25 but less than 40, and at least an intermediate risk of developing diabetes as measured by the AUSDRISK scale. Careful consideration was given to the eligibility of patients who had already developed diabetes. It was decided that is would be likely that their motivation for lifestyle change would be different to those patients without diabetes. Thus, patients with diabetes were not included so this is a study of the acceptability of The Change Program to patients who have not developed a chronic disease.

This part of the doctoral work is part of the feasibility phase in the MRC guidelines.

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Feasibility and acceptability of a physician-delivered weight management programme

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Abstract

Background. Primary health care requires new approaches to assist patients with overweight and obesity. This is a particular concern for patients with limited access to specialist or allied health services due to financial cost or location. The Change Program is a toolkit that provides a structured approach for GPs working with patients on weight management.

Objective. To assess the acceptability and feasibility of a GP-delivered weight management programme.

Methods. A feasibility trial in five Australian general practices with 12 GPs and 23 patients. Mixed methods were used to assess the objective through participant interviews, online surveys and the NOrmalization MeAsure Development (NoMAD) tool based on Normalization Process Theory. Content analysis of interviews is presented alongside Likert scales, free text and the NoMAD tool.

Results. The Change Program was acceptable to most GPs and patients. It was best suited to patient–GP dyads where the patient felt a strong preference for GP involvement. Patients' main concerns were the time and possible cost associated with the programme if run outside a research setting. For sustainable implementation, it would have been preferable to recruit a whole practice rather than single GPs to enable activation of systems to support the programme.

Conclusion. A GP-delivered weight management programme is feasible and acceptable for patients with obesity in Australian primary health care. The addition of this structured toolkit to support GPs is particularly important for patients with a strong preference for GP involvement or who are unable to access other resources due to cost or location.

Key words: General practice, health promotion, obesity, patient-centred care, pilot study, primary health care.

Introduction

Obesity is a global health challenge responsible for an estimated 2.8 million deaths annually and 35.8 million lost disability-adjusted life years (1). Reversing the rising prevalence of obesity requires complex multilevel responses (2). While population-based strategies are critical, optimizing care for those individuals who already have weight problems is necessary. Although multidisciplinary care is the preferred framework for patients with obesity, this is not always available. Location (e.g. rural communities), cost, patient time pressures or preference (3) may necessitate the involvement of the GP in weight management (4).

In the Australian health care system, GPs are the first contact point and provide management based on the principles of

person-centeredness, whole person and longitudinal care. In Australia, 85% of the population visit a GP annually and a majority report attending a regular general practice (5). Due to the Australian universal medical insurance scheme, Medicare, 85% of GP consultations are provided at no cost at the point of care (5).

Internationally there has been increasing interest in the expert generalist service provided by GPs and family doctors (6). Expert generalism describes the ability to care for any person, with any disease, leveraging knowledge of that person's social connections (6). Regarding obesity, this equates to the GP providing nutrition, physical activity and behavioural interventions in the context of the patient's entire medical, social and psychological history. Robust primary health care is associated with improved patient outcomes at a lower cost to the community compared to tertiary care (7); however, this has yet to be fully realized in obesity management.

The process for developing The Change Program toolkit has been reported previously (8). Initially, a review of current Australian obesity clinical practice guidelines was undertaken to synthesize evidence-based best practice (9). This synthesis was used to develop a practical toolkit (The Change Program) in collaboration with practicing GPs, dieticians, psychologists and consumers using recognized principles of evidence translation (8).

Feasibility studies are undertaken to determine the worth of pursuing larger effectiveness trials (10). In complex interventions in primary health care, stepwise assessment can reduce the likelihood of trial failure due to implementation issues (11). The aims of this trial were to assess:

(1) feasibility of a GP-delivered weight management programme,
(2) acceptability of such a programme to both patients and GPs and
(3) implementation of the study protocol by exploring recruitment processes, dropout rates and time frames.

Methods

General practitioner recruitment

This feasibility trial recruited individual GPs via an email to the University's network, which includes ~700 GPs from the Australian Capital Territory and New South Wales. Fully qualified GPs were eligible if they worked at least 1 day per week. Once recruited, GPs were asked to recruit another GP in their practice.

Patient recruitment

At least two eligible patients were recruited by GPs during consultations initiated by patients for any reason. Informed consent was obtained. Inclusion criteria for patients were age 18–65 years, English literate, body mass index (BMI) of >25 kg/m^2 and <40 kg/m^2, at least three appointments with the GP in the previous 2 years as a surrogate marker for regular general practice, no past or scheduled bariatric surgery and intermediate or high risk of developing diabetes using the Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK) indicating metabolic risk associated with overweight and obesity (12). The AUSDRISK tool is commonly used in Australia to assess lifetime risk of diabetes and includes demographic, anthropometric and relevant history.

Exclusion criteria were uncontrolled medical or mental health condition, history of diabetes, congestive heart failure, chronic renal failure, chronic obstructive pulmonary disease, significant immobility, history of an eating disorder, current pregnancy or breastfeeding and taking weight loss medications. This programme was aimed at primary prevention, and therefore patients with a diagnosed chronic illness were excluded. Hypertension, dyslipidaemia and glucose intolerance were not exclusion criteria. The research team determined that patients in the secondary prevention phase of obesity care have different motivations for change than those in primary prevention phase. The eligibility criteria were altered to allow patients to be recruited with a BMI up to 42 kg/m^2 at the request of some GPs. Patients consulted their GP in their usual location.

Weight management programme

The Change Program toolkit includes the GP handbook (40 pages of reference material), patient workbook (64 pages of patient information and worksheets) and a computer template interactive with clinical software (8). The patient workbook contains educational factsheets and exercises based on cognitive behavioural therapy (CBT) and mindfulness. The GP handbook provides information on obesity, motivational interviewing and CBT techniques. The computer template captured all aspects of the consultation including those unrelated to the weight management programme. The management of other health problems during a weight consultation was at the discretion of the GP. The research team paid GPs $65 for consultations up to 20 minutes and $120 for >20 minutes consistent with time-based payments for GP services in Australia. The amount paid reflected the average private billing rate for GP practices in our region.

Sample size

To assess the inter- and intra-practice variability for a future cluster randomized trial, a minimum of 20 patients were required in 5 practices with at least 2 GPs per practice. This will allow for the determination of the intra-class coefficient.

Outcomes

The primary outcomes of interest were the feasibility and acceptability of The Change Program. At 3 months, patients completed an online survey that consisted of Likert scales and open text to assess acceptability of elements of the programme, including the programme materials, the process of working with their GP and overall regard for the programme. The recently developed quantitative NOrmalization MeAsure Development (NoMAD) tool (13) was administered online to GPs at 6 months to evaluate the implementation process using descriptive statistics.

The NoMAD tool was chosen as it is the first quantitative measure based on Normalization Process Theory (NPT). The NPT describes four constructs: Coherence (sense-making of new practices), Cognitive Participation (building working relationships around new practices), Collective Action (operationalizing a new practice), and Reflexive Monitoring (ability to reflect on the new practice). The NoMAD tool allows for comparison between individuals across the four key concepts of NPT using Likert scales. The tool was adapted in line with the developer's recommendations.

A nested qualitative evaluation was also conducted via proforma interviews. Interviews were conducted by a member of the research team (GP or research officer) at the conclusion of the study in a location convenient for the participant. The interviews were audio-recorded and transcribed verbatim. The research team developed an *a priori* thematic framework based on the study aims of measuring acceptability and feasibility (see Supplementary Table S1). Two researchers (ES and NE) performed content analysis on the interview transcripts using this framework. The number of appointments attended, time spent in consultations, recruitment and dropout rates

were recorded in a computer template and reported in descriptive statistics to assess the research protocol.

Results

Recruitment of GPs commenced in April 2015 and was complete in 4 days. The 12 recruited GPs had an average 12 years of experience (range 4–30 years). The GPs worked in four urban practices and one rural practice. Due to unexpected leave, 1 GP did not recruit any patients, and the 11 remaining GPs recruited 23 patients (20 women, 3 men) over 4 months (see Table 1). Three patients formally withdrew by 3 months and one patient was lost to follow up, with only the information from their GP computer template available for analysis (see Fig. 1).

There was a good response rate to all of the survey and interview items. All GPs completed interviews at time 0 and 6 months, and 10 of 11 GPs completed the NoMAD survey online. At time 0, 22 of 23 patients completed the online survey, 17 of 20 at 3 months, 15 out of 20 at 6 months and 15 out of 20 completed the end of study interview. At least four attempts (via phone or email) were made to follow up survey and interview non-responders.

From the computer template, it was found that on average patients attended 6.5 appointments. The average consultation length was 25.6 minutes (range 11–60 minutes, median 24 minutes, interquartile range 15 minutes). First consultations were significantly longer than subsequent consultations, 33.9 minutes [95% confidence interval (95% CI) = 30.0–37.8 minutes] and 23.7 minutes (95% CI = 21.8–25.5 minutes), respectively. The GPs recorded the management of 44 other health-related items during the consultations in addition to the weight management programme (e.g. preventative health, acute illness and follow up after hospital admission) reflecting the expert generalist nature of general practice. In three consultations the GP deemed it inappropriate to discuss weight related issues due to acute distress.

Patient and general practitioner acceptability

In the 3-month online survey, 11 of 17 (65%) patients either agreed or strongly agreed that The Change Program was helpful, and 14 (82%) either agreed or strongly agreed that they would recommend it to a friend. In the 6-month online survey, 6 out of 10 (60%) GPs indicated that it would become part of their regular work if available (8/10 rating or more).

In the 6-month interviews, almost all the GPs and a majority of the patients found The Change Program an acceptable concept.

> I really enjoyed it; I think it's been fantastic. …I will be continuing, I'm going to make an appointment over the next two or three months and I will continue until I hopefully reach my goals. (Patient 20)

> I've enjoyed it, I just needed something, I needed another way. I've done [commercial weight loss program] and I've done the gym and…but it was always fairly quick and then I'd put weight back on. (Patient 22)

In interviews, the GPs provided positive feedback on the formalized structure of the programme and the patient workbook.

> It was good. It was good to have a structure. (GP 22A)
>
> Yes I would (use it in the future). …I'm a fan of the handout, and it's nice to have something to give people. (GP 24B)

The role of the GP relationship was explored in the interviews with the patients. This relationship was important for many patients and corresponded to attendance at more appointments and longer time in the programme.

> I think you've already got a rapport with them and they understand your history. (Patient 18)
>
> I think (The Change Program) probably strengthened (my relationship with my GP). …she spent a lot of time with me, and she seemed very conscientious about the whole thing. (Patient 14)
>
> The doctor knows that this is a long term commitment. (Patient 20)

Feasibility

Future cost, outside the research setting, was a common patient concern. Most patients said that any out of pocket costs for appointments would prohibit them from participating fully.

> When you had to go in fortnightly, I probably wouldn't if I had to pay for that myself. I wouldn't have done it fortnightly, I would probably do every six weeks or something like that. (Patient 7)

A few patients reported challenges with getting time off work or getting an appointment with their GP.

> Doctors tend to be rare entities for being able to get to appointments with, …the last appointment I had to cancel it because of work and then of course, work cancelled the trip that they were sending me on…I was not happy. (Patient 18)

Patient withdrawals

Three female patients formally withdrew from study, and a further three female patients attended four appointments or fewer. These patients had appointments that were an average of 27.9 minutes (95% CI = 22.4–33.4 minutes), which was not significantly different from those patients that remained in the programme. These patients were less favourable about the programme overall.

> I don't think I found it particularly useful. It was useful in terms of I had the fortnightly goals to work toward, but I didn't find the program itself particularly useful. (Patient 5)

Table 1. Feasibility study of a general practitioner-delivered weight management programme, patient demographic and characteristics at the start of the study (n = 23)

Gender	20 women	3 men
Age	<45 years = 8	45–54 years = 9 55–64 years = 6
AUSDRISK score	8 intermediate risk	15 high risk
Any previous weight loss attempts: NR = 5	Yes = 17	No = 1
Weight	Mean 100.2 kg (median 97.8)	SD 12.1 (range 78.2–134.1 kg)
Body mass index	Mean 35.7 kg/m^2 (median 35.1)	SD 3.3 (range 29.2–42.9 kg/m^2)
Waist circumference	mean 108.5 cm (median 108)	SD 8.4 (range 90–132.0 cm)

AUSDRISK, Australian Type 2 Diabetes Risk Assessment Tool; NR, not recorded; SD, standard deviation.

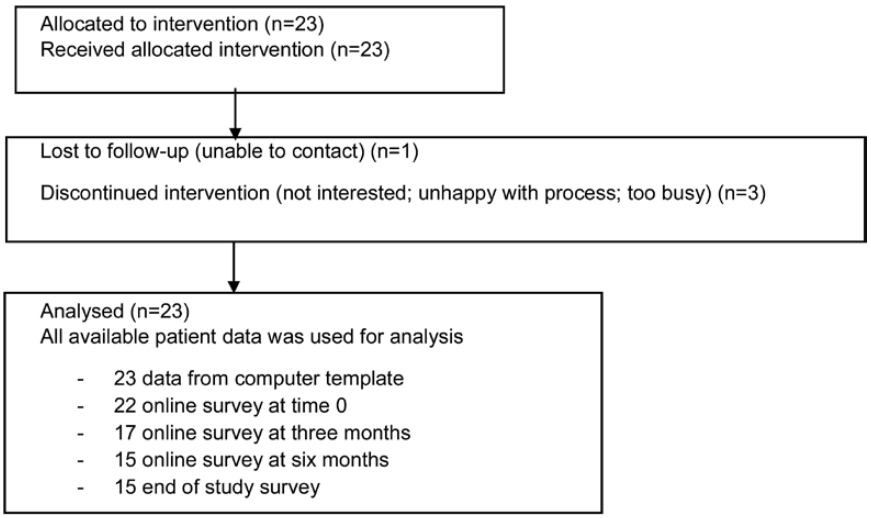

Figure 1. Patient recruitment and retention.

Two patients expressed guilt about seeing their GP and felt they were overusing their GP's time.

> I must admit I felt frequently embarrassed that I was taking up a lot of my GP's time. (Patient 8)

One patient withdrew at time 0 as they felt the program was not within a GP's scope of practice.

> To me a GP is…, the one stop shop of 'OK where do we go from here?' You know, if you've got something serious you go elsewhere. (Patient 17)

Programme implementation

At the end of the trial the NoMAD instrument was administered to the GPs to assess implementation (see Fig. 2). All 10 (100%) GPs saw the potential value of The Change Program in their ongoing work. However, only 4 out of the 10 (40%) GP respondents believed the other staff in their practice had an understanding of The Change Program. Four out of nine GPs (55%) wanted further resources and training to aid implementation. Every GP (100%) viewed the programme as a legitimate part of their professional role, and all 10 (100%) GPs indicated they would continue to support the programme.

Study protocol

Patient recruitment issues that were identified by the research team for the GPs included time limitations, GPs waiting for disadvantaged patients who could benefit from the free appointments that this research offered, a lack of willingness to discuss with all eligible patients and finding patients that matched the selection criteria. In particular, the GPs reported that finding patients with a BMI < 40 kg/m^2 and without diabetes was particularly challenging. Two of the GPs did not use the computer template for recording consultations due to poor interactivity and usability of the template.

The interviews also allowed the participants to make suggestions about how the programme materials could be improved. Suggestions for improvements included a request for more recipes, reordering of topics in the patient handbook, improved tabulation for ease of finding materials and incorporation of the behavioural supports throughout the book.

Conclusions

The Change Program was acceptable to most GPs and patients involved in this feasibility trial based on both quantitative and qualitative data. The GPs reported that the structure of the programme and the patient handbook assisted them in the management of obesity. Patients who had a strong preference for the involvement of their GP were especially positive about the experience. The Change Program provides GPs and patients a straightforward, structured package to manage obesity in the general practice setting.

Regarding feasibility, the study protocol might be improved if the entire practice is aware of the programme and its aims rather than individual GPs. This would allow for whole of practice systems, such as appointment bookings and recalls, to be engaged in the process. Also, direct advertising of the research opportunity to patient in waiting rooms may improve recruitment. The programme materials have also been enhanced based on feedback from all participants.

This study is the first time a GP-delivered weight management programme has been trialled in Australia and is one of few examples of GP involvement in delivering an obesity intervention. As GPs are generalists, they can incorporate obesity management within the treatment of other acute and chronic health issues. In this feasibility study, GPs managed other health issues ranging from acute illness to preventive care within the same consultation as addressing weight loss. Comprehensive and coordinated care is central to quality general practice and offers economic benefit because more issues are covered within one consultation. Involving GPs in obesity management is likely to offer benefits often seen with holistic health management and care that is not fragmented (14).

The strong preference shown from most of the patients for their GPs' involvement in weight management reflects other surveys of patients in primary care (3,15). It seems that there may be therapeutic benefit for patients working closely with a trusted health practitioner with whom they have an ongoing relationship (16). Strong and collaborative patient–GP relationships are likely to be a resource to leverage for long-term lifestyle behaviour change. The therapeutic relationship between patient and practitioner is worthy of further research to determine its association with successful weight management in primary health care.

This study demonstrates that it is acceptable and feasible for GPs to assist their patients with overweight and obesity if they

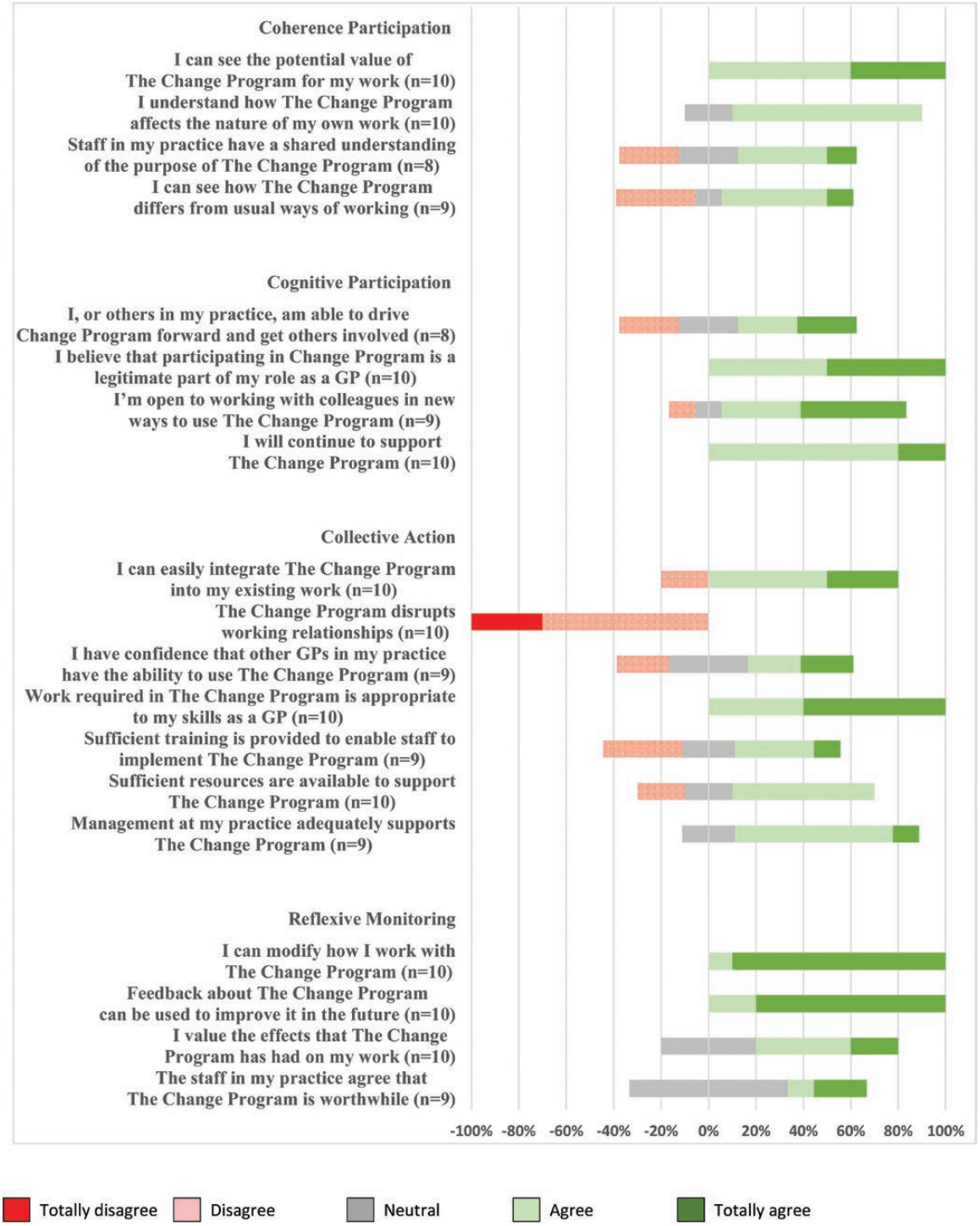

Figure 2. Views from GP participants at the end of the feasibility study (6 months) using the NOrmalization MeAsure Development (NoMAD) tool.

are afforded the time and appropriately remunerated. The reluctance reported by patients to cover the costs of the programme themselves needs further evaluation during a large-scale rollout. The payment structure in the study rewarded GPs for spending more time with patients leading to a long average consultation compared to Australian norms (17). However, unrelated items, such as preventive health and acute illness, were managed across the consultations in addition to weight management. In future, research investigating clinical outcomes of The Change Program, the time spent in consultations and the model of remuneration will be evaluated.

This was a small sample of patients from two regions in Australia. It is possible that the GPs recruited to the study were particularly interested in weight management, and their views of the programme may not reflect that of all GPs. The age of the patients involved were representative of Australian general practice with the peak age for accessing GP services 45–64 years (18). However, 87% were women, which is a higher proportion

than the average general practice population. None of the male patients withdrew from the study. Gender specific issues could be explored as part of a larger effectiveness trial.

A strength of The Change Program is that the vast majority of patients had previously tried to lose weight. This demonstrates that even patients with previous weight loss attempts were still motivated to engage with this programme. A further strength of the study is the mixed methods approach to the analysis that gives depth to the findings and a firm platform from which to build future work. The validity and reliability of the NoMAD tool have not been published by the developers. However, the tool outcomes were consistent with the qualitative data in this trial.

The Change Program was acceptable and feasible for both patients and GPs. Increasing the involvement of GPs in obesity management can reduce health care fragmentation through holistic, person-centred care that epitomizes excellence in general practice.

Supplementary material

Supplementary material is available at *Family Practice* online.

Declaration

Funding: Australian Primary Health Care Research Institute via a Foundation Grant.
Ethical approval: the study was approved by Australian National University Human Research Ethics Committee, and the trial was prospectively registered at Australian New Zealand Clinical Trials Registry ACTRN12614001192673.
Conflict of interest: none.

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References

1. World Health Organisation. Obesity: Situation and Trends. 2015. http://www.who.int/gho/ncd/risk_factors/obesity_text/en/ (accessed on May 2016).
2. Government Office for Science. *Tackling obesities: future choices – obesity system atlas*. UK: United Kingdom Government, 2007. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/295153/07-1177-obesity-system-atlas.pdf (accessed on 7 October 2016).
3. Tan D, Zwar NA, Dennis SM, Vagholkar S. Weight management in general practice: what do patients want? *Med J Aust* 2006; 185: 73–5.
4. Jansen S, Desbrow B, Ball L. Obesity management by general practitioners: the unavoidable necessity. *Aust J Prim Health* 2015; 21: 366–8.
5. McRae I, Yen L, Gillespie J, Douglas K. Patient affiliation with GPs in Australia—who is and who is not and does it matter? *Health Policy* 2011; 103: 16–23.
6. Reeve J, Irving G, Freeman G. Dismantling Lord Moran's ladder: the primary care expert generalist. *Br J Gen Pract* 2013; 63: 34–5.
7. Starfield B, Shi L, Macinko J. Contributions of primary care to health systems and health. *Milbank Q* 2005; 83: 457–502.
8. Sturgiss E, Douglas K. A collaborative process for developing a weight management toolkit for general practitioners in Australia—an intervention development study using the Knowledge To Action framework. *Pilot Feasibil Stud* 2016; 2: 20. doi:10.1186/s40814-016-0060-4.
9. Sturgiss E, Douglas K, Kathage R, Res S. A synthesis of selected national Australian guidelines on the management of adult patients who are overweight or obese. *Aust Fam Physician* 2016; 45: 327–31.
10. Eldridge SM, Lancaster GA, Campbell MJ *et al*. Defining feasibility and pilot studies in preparation for randomised controlled trials: development of a conceptual framework. *PLoS One* 2016; 11: e0150205.
11. *Developing and Evaluating Complex Interventions: New Guidance*. London, UK: Medical Research Council, 2006.
12. Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK). 2013. http://www.health.gov.au/preventionoftype2diabetes (accessed on October 2016).
13. Finch TL, Girling M, May CR *et al*. NoMAD: Implementation Measure Based on Normalization Process Theory. 2015. http://www.normalization-process.org/ (accessed on October 2016).
14. Stange KC. The problem of fragmentation and the need for integrative solutions. *Ann Fam Med* 2009; 7: 100–3.
15. van Dillen SM, Hiddink GJ, Koelen MA, de Graaf C, van Woerkum CM. Perceived relevance and information needs regarding food topics and preferred information sources among Dutch adults: results of a quantitative consumer study. *Eur J Clin Nutr* 2004; 58: 1306–13.
16. Stewart M, Brown JB, Donner A *et al*. The impact of patient-centered care on outcomes. *J Fam Pract* 2000; 49: 796–804.
17. Britt H, Valenti L, Miller G. Time for care. Length of general practice consultations in Australia. *Aust Fam Physician* 2002; 31: 876–80.
18. Britt H, Miller GC, Henderson J *et al*. *General Practice Activity in Australia 2014–15*. Sydney, New South Wales, Australia: University of Sydney, 2015.

Chapter 6

Increasing general practitioners' confidence and self-efficacy in managing obesity: a mixed methods study

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Both Australian and international literature point to the low confidence of GPs when faced with management of a patient with obesity. In this concurrent triangulation mixed methods paper, focus is on the self-efficacy of GPs and is informed by Bandura's social cognitive theory. We find that providing GPs with an experience where they feel they have achieved something with their patient (i.e. a "performance mastery" experience) improved their confidence, and their description of how they manage obesity in their daily practice.

Often interventions are evaluated using a clinical competency framework, however this work uses an alternative approach by exploring the clinician's own view of their competence, and efficacy. This is a novel application of Bandura's theory which is usually applied to patients, but not to the practitioner. Social Cognitive Theory is the most commonly used theoretical framework in any behaviour change intervention and has the most evidence associated with changing outcomes. In this paper, this is referred to as the "professional self-efficacy" for obesity management. It is argued that if GPs have low self-efficacy for obesity management, they will be less likely to raise obesity as an issue with patients and follow through with appropriate care.

BMJ Open

Increasing general practitioners' confidence and self-efficacy in managing obesity: a mixed methods study

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ABSTRACT

Objectives: Internationally, general practitioners (GPs) are being encouraged to take an active role in the care of their patients with obesity, but as yet there are few tools for them to implement within their clinics. This study assessed the self-efficacy and confidence of GPs before and after implementing a weight management programme in their practice.

Design: Nested mixed methods study within a 6-month feasibility trial.

Setting: 4 urban general practices and 1 rural general practice in Australia.

Participants: All vocationally registered GPs in the local region were eligible and invited to participate; 12 GPs were recruited and 11 completed the study.

Interventions: The Change Programme is a structured GP-delivered weight management programme that uses the therapeutic relationship between the patient and their GP to provide holistic and person-centred care. It is an evidence-based programme founded on Australian guidelines for the management of obesity in primary care.

Primary outcome measures: Self-efficacy and confidence of the GPs when managing obesity was measured using a quantitative survey consisting of Likert scales in conjunction with pro forma interviews.

Results: In line with social cognitive theory, GPs who experienced performance mastery during the pilot intervention had an increase in their confidence and self-efficacy. In particular, confidence in assisting and arranging care for patients was improved as demonstrated in the survey and supported by the qualitative data. Most importantly from the qualitative data, GPs described changing their usual practice and felt more confident to discuss obesity with all of their patients.

Conclusions: A structured management tool for obesity care in general practice can improve GP confidence and self-efficacy in managing obesity. Enhancing GP 'professional self-efficacy' is the first step to improving obesity management within general practice.

Trial registration number: ACTRN12614001192673; Results.

Strengths and limitations of this study

- The study used social cognitive theory which has been broadly studied in the health promotion setting.
- The management of obesity is an important issue in the primary healthcare setting.
- The mixed methods approach, using quantitative survey plus qualitative interviews, strengthens the study.
- The small sample of self-selecting general practitioners is a limitation of the study.

BACKGROUND

Throughout international healthcare systems, obesity has become an increasingly important risk factor for the development of chronic illness. The global prevalence of diabetes alone has risen from 4.7% in 1980 to 8.5% in 2014, primarily due to obesity rates.[1] Obesity has an impact on the health of an individual, physically and psychologically, as well as increasing community healthcare costs and indirect economic costs.[2] Approaches to assist people who are living with obesity are clearly needed.

General practitioners (GPs), also known as family doctors, have a vital role to play in health promotion for their patients.[3–5] Internationally, health promotion is a fundamental component of specialty training programmes for GPs.[6–9] GPs are expected to promote lifestyle measures that prevent disease and enhance health and have demonstrated previous success in this goal. For example, GPs have been instrumental in the reduction in smoking rates[10] and administration of immunisation programmes,[11] and are a respected source of nutrition advice.[4 12] GPs regularly provide lifestyle advice to patients when managing chronic illnesses such as diabetes, heart disease and arthritis.[13]

The majority of obesity management interventions in primary care focus on the GP delegating appropriate care to other health practitioners or into external services.[14] Despite this, there are many reasons why an

individual patient may prefer to see their GP for obesity management rather than an external provider. Cost, patient preference and, particularly in rural settings, access and availability are recognised as factors influencing patient preference for management within general practice.[5] However, with respect to obesity management, GPs have reported low confidence in their ability to have an impact on their patients' outcomes.[15] Reasons for this include lack of consultation time, feeling poorly trained in this clinical area and being unconvinced that their intervention will change patient behaviour.[15]

The '5As' is generally the approach recommended to GPs for structuring the management of patients living with obesity.[16] This framework encourages GPs to 'Ask' permission from the patient, 'Assess' the individual, provide 'Advice' on health impacts and treatments available, 'Agree' with the patient on the best way forward and 'Assist' them in accessing the services they need.[16] A cross-sectional analysis of consultations using the 5As approach has demonstrated that GPs are less likely to 'Assist' and 'Arrange' and more likely to only 'Ask' and 'Assess'.[16] It is reported that patients who receive care that includes the 'Assist' and 'Arrange' components of the 5As framework are more likely to change their behaviour.[17] Thus, it is suggested that GPs require support to provide care that incorporates all five 'As'. Although this framework may be simplistic and is undoubtedly influenced by a patient's motivation to change,[18] it continues to be the most referenced approach in the literature.[16]

Social cognitive theory (SCT) links self-efficacy to an individual's health behaviours and lifestyle.[19] Traditionally, it is used in health promotion fields to explain a patient's ability to start and sustain new habits. Change occurs through a patient's belief that they can perform the required new behaviour (efficacy expectation) and that this new behaviour will lead to the desired health outcome (outcome expectation). The strongest influence on self-efficacy is 'performance mastery', in which the experience of having a successful outcome from a personal action provides confidence in one's ability.[19]

GPs provide interventions that enhance 'patients' self-efficacy' to achieve behaviour change. It is probable that GPs with low confidence in providing an intervention would have difficulty in supporting patients to take control of their own health. Confidence is distinct from self-efficacy in that self-efficacy is a concept bound in theory that describes levels of belief as well as capability, whereas confidence is a non-specific term for describing someone's belief in a thing.[20] The likelihood of patient behaviour change is therefore related to the GPs' 'professional self-efficacy' to deliver an intervention. For that reason, it is important to address GPs' 'professional self-efficacy' as a precondition for promoting self-efficacy in patients.

SCT can also provide a useful theoretical framework for understanding GPs' views on obesity management.[19] A GP who has low self-efficacy to assist patients is likely to be heavily influenced by their previous experience of poor outcomes.[15] Efficacy expectation from SCT can be used to describe the GP's belief that they have the skills to provide obesity management for a patient. Outcome expectation from SCT can be related to the GP's belief that their management will lead to patient behaviour change. We hypothesise that providing GPs with a 'performance mastery' experience is likely to affect their self-efficacy for assisting patients living with obesity.

The Change Programme is a GP-delivered weight management programme that was developed based on Australian guidelines[21] for the management of obesity in primary healthcare.[22] The programme consists of a GP handbook, patient workbook and computer template.[23] The suggested schedule is appointments every 2 weeks for 3 months followed by less frequent consultations for up to 2 years. The Change Programme is based on one of the pillars of general practice—'patient-centredness'. For this reason, there are no directive patient goals. For each patient, the GP works with them as an individual. Some will have goals around physical activity, nutrition, for others, it will be time management and social connection. The programme is based on principles of self-management[24] in which the enhancement of a patient's ability to self-care reduces the consequences of living with a chronic illness, and capitalises on the therapeutic potential of being cared for by a regular health practitioner.[25]

The aim of this study was to describe the impact of participating in a pilot intervention for obesity management, The Change Programme, on the self-efficacy and confidence of Australian GPs.

METHODS

This mixed methods study of GP self-efficacy was embedded within a 6-month pilot study of weight management in general practice. The ANU Human Research Ethics Committee approved this study. Informed, written consent was obtained from each of the participants. Approximately 700 local GPs on the contact list of the academic unit of general practice were invited to participate in the study. We aimed to recruit 10 GPs working in 5 different general practices for this initial pilot study and this was achieved within 4 days. We recruited GPs in the order that they expressed interest. Once five general practices were recruited, we ceased accepting expressions of interest. Within these 5 general practices, 12 self-selecting GPs were recruited and then each recruited at least 2 adult patients from those that presented to their practice for any reason.

The patients initially attended appointments every 2 weeks, with less frequent appointments as the programme continued. The patient handbook contains fact-sheets with information on obesity, worksheets based on cognitive–behavioural therapy and mindfulness, nutritional and physical activity diaries, and worksheets to record goal setting. The consultation content was

directed by individual patient needs and included nutrition, physical activity and behavioural support management (eg, stimulus control, goal setting, self-monitoring, cognitive restructuring, problem solving). The GPs were not directed as to whether they should complete the patient handbook within consultation time, or set it as work to do between sessions. The GPs were not offered any training beyond the written handbook as in earlier qualitative work GPs stated they did not want a programme that required additional training.[23]

Evaluation of the study outcomes included a quantitative survey consisting of Likert scales in conjunction with pro forma interviews. The GPs were also asked to complete a survey containing questions related to self-efficacy, each rated on a four-point Likert scale. A four-point Likert scale was chosen to avoid having a middle response. The survey was based on validated tools for self-efficacy[26–28] and has been published in full previously.[15] Likert net stacked distribution graphs were used to compare the pre and postsurvey results as they provide an excellent graphical representation of data. Hypothesis testing was not completed due to the small sample size and the graphs should be considered as descriptive, non-inferential statistics of change.

The survey was used as a platform for interviews conducted with GPs at the initiation and conclusion of the pilot intervention; changes in the GPs' confidence, clinical practice and sense of self-efficacy were discussed. Pro forma interviews were conducted by a GP researcher in a location convenient to the GP participants. The interviews were audiotaped and transcribed verbatim by a professional transcribing service. Two authors (ES, NE) independently reviewed deidentified transcripts in Microsoft Word for three preidentified themes: confidence, self-efficacy and change in clinical practice. These themes were based on SCT and the pro forma interviews were structured to gather this information. The only other information that was offered in the interviews was possible improvements to The Change Programme and this has been presented elsewhere.[29] The review findings were discussed between the two authors until consensus was reached.

The qualitative results related to GP self-efficacy at the beginning of the pilot have been previously reported.[15] This paper will report on the self-efficacy questionnaire responses from the GPs at the beginning and end of the 6-month pilot, as well as the qualitative interview data from the end of the pilot.

RESULTS

The 12 GPs practised in 5 different general practices, 1 rural and 4 urban, and had between 4 and 30 years clinical experience. One GP went on unexpected leave and did not recruit any patients, while another GP recruited three patients. All of the GPs who recruited patients were interviewed and completed the survey at the end of the trial.

There was an improvement in the Likert scale values across almost all indicators (see figures 1–3) in the post-pilot surveys. In each figure, the median response is indicated by the black line and the width of the coloured bar represents the mode. Outcome expectations, in which the GP is confident that their approach to obesity will lead to better health outcomes, are demonstrated in figure 1. Both the median score for the GPs' perceptions that counselling made a difference to patient behaviour and the median score for belief that the GP can empower a patient to change their behaviour indicated improvements in GPs' expectations of outcomes.

Efficacy expectations, in which the GP is confident that they can assist a patient to change their behaviour, are demonstrated in figures 2 and 3. Figure 2 focuses on the 'Assess' and 'Advise' phases of the 5As framework with improvement in the number of GPs who agree or strongly agree, particularly for nutrition counselling. Figure 3 has items relating to the 'Assist' and 'Arrange' phases of the 5As with improvements in the median Likert score across all questions, including identifying barriers, tailoring a plan to an individual and addressing obstacles to change.

The qualitative interview data supported the survey results with most GPs reporting an improvement in their overall confidence when managing patients with obesity.

> I think I'm more confident to know where to start in assessing the patient in terms of sort of things that are contributing to overweight and obesity, and their readiness for change, and then starting to set some goals with them and working towards those goals, and being able to give them more specific suggestions for change and what they might work on. (GP-D)

Specifically, some GPs stated that the access to a structured toolkit helped them to feel more confident in their management.

> I think it's given me some [confidence]…perhaps some more tools and resources, which has been helpful. (GP-H)

The GPs also reported an improvement in self-efficacy for obesity management. This was due to seeing changes in their patients which then gave them confidence in the work they were doing.

> I feel very encouraged by the results. I think the results [have] been good, and … I think I was effective in these three patients. (GP-L)

In the interviews, GPs recognised a change from their usual clinical practice after taking part in the pilot study. Examples given included an increase in their clinical knowledge, improvements in individualising care and increasing frequency of consultations.

> I talk a bit more about the plateauing, because that was something I wasn't that aware of. And so that's really helpful, I think, in talking to other [patients]. (GP-SP)

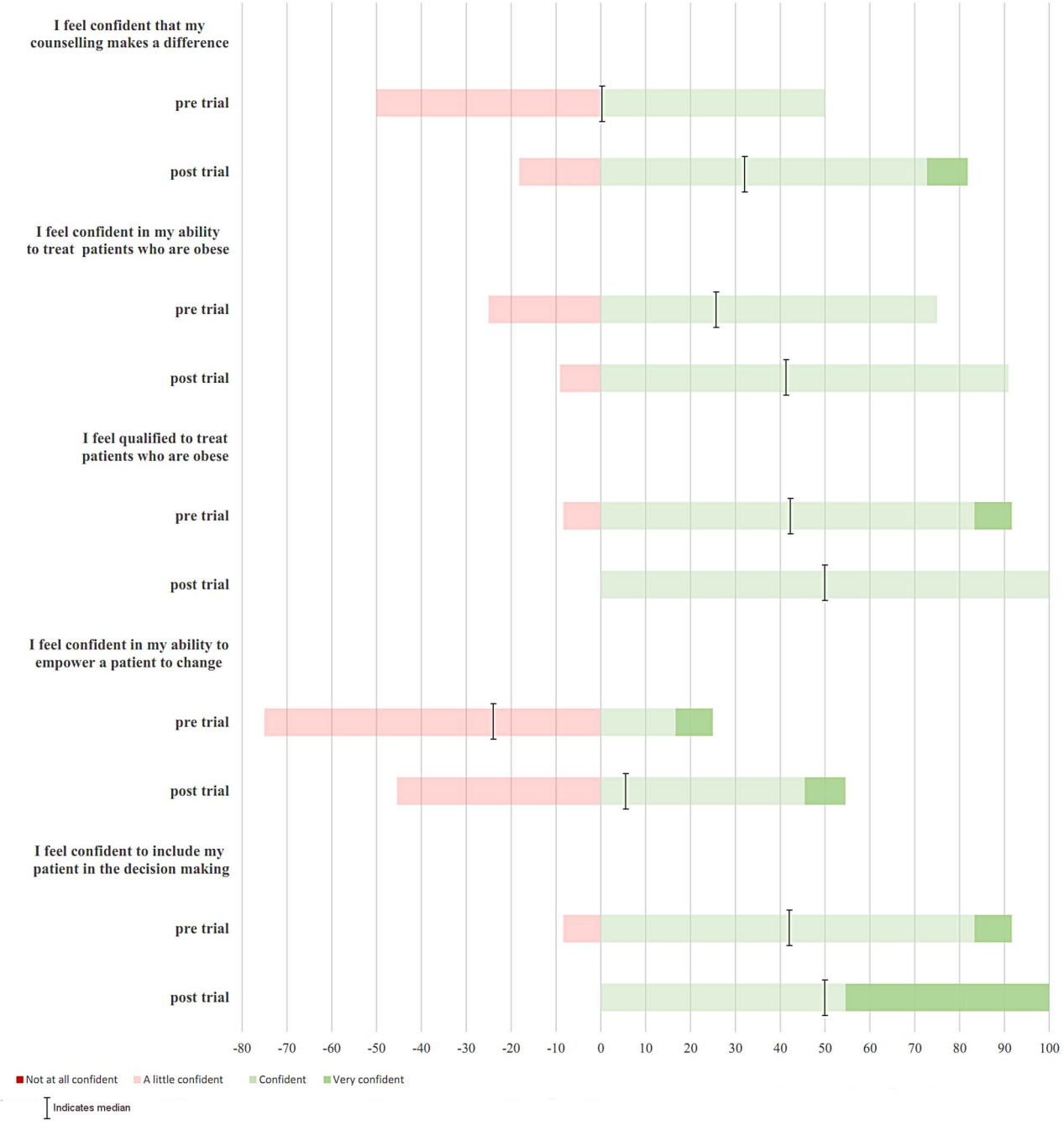

Figure 1 Survey results for general practitioners (GPs) pre and postpilot study relating to GP outcomes expectations for managing adult patients with obesity. Dark red, a little confident; light red, not at all confident; light green, confident; dark green, very confident. Black line indicates the median value.

> I think it's just a general change in my practice over the last period in that being less focussed on the numbers goals [i.e. kilogram weight loss] and bit more focussed on individualising the care. (GP-SE)

> That's the main thing that I'm going to change in the future, is just a more regular quick face-to-face interaction, so they feel accountable. (GP-P)

Additionally, some GPs reported that they had already changed their practice with other patients who were not engaged in the pilot trial. Some GPs reported feeling more comfortable talking to other patients about obesity, and applying some aspects of The Change Programme to other patients.

> I'm also taking a lot more waist circumferences now. And I'm weighing people more. In general in my practice… I used to be a little bit uncomfortable with it, and now I'm more comfortable saying do you mind hopping on the scale, let's see what you weigh. Doing a waist circumference … And then opening up the conversation…and

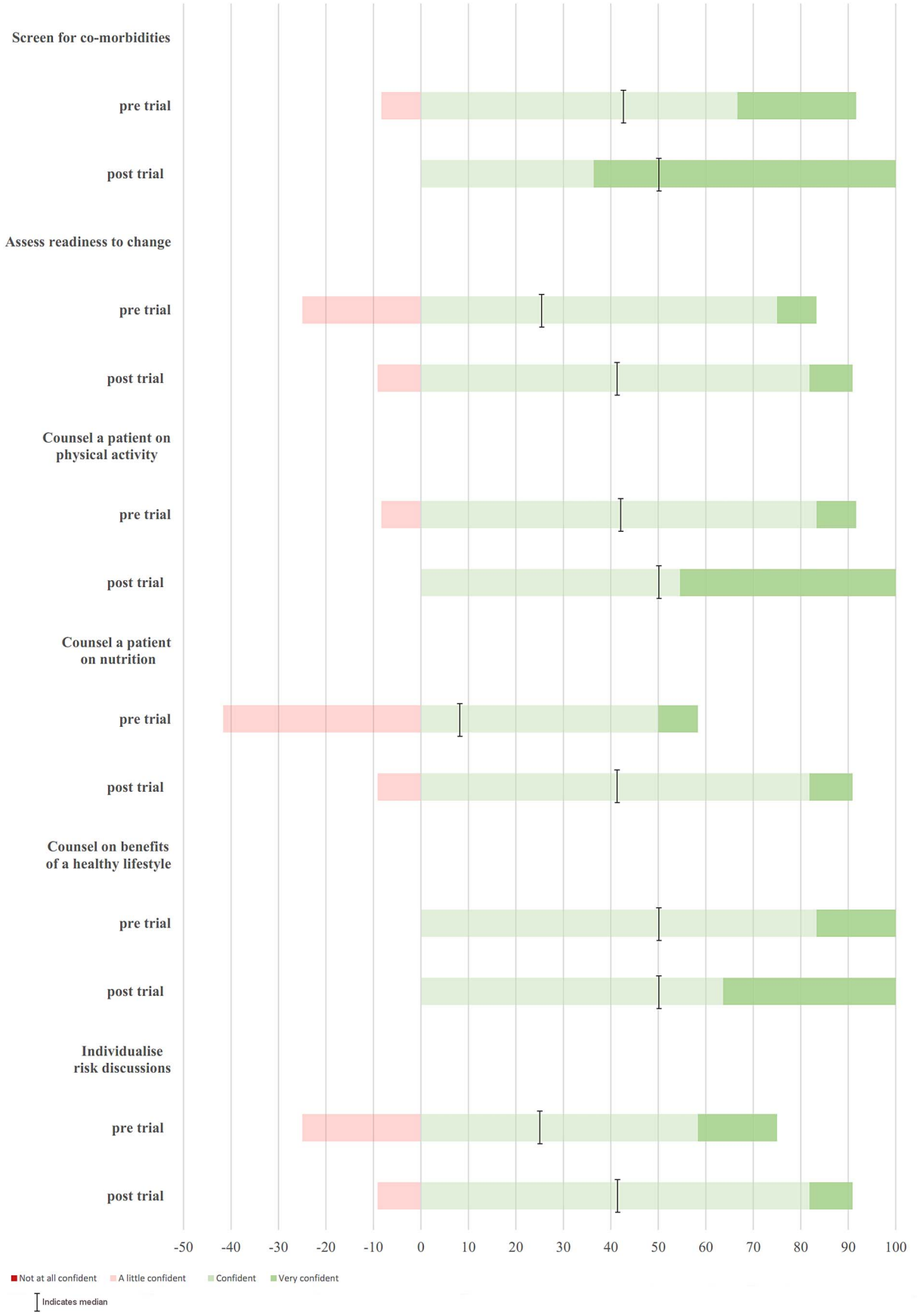

Figure 2 Survey results for general practitioners (GPs) pre and postpilot study relating to GP efficacy expectations in the 'Assess' and 'Advise' categories of the 5As framework. Light red, a little confident; dark red, not at all confident; light green, confident; dark green, very confident. Black line indicates the median value.

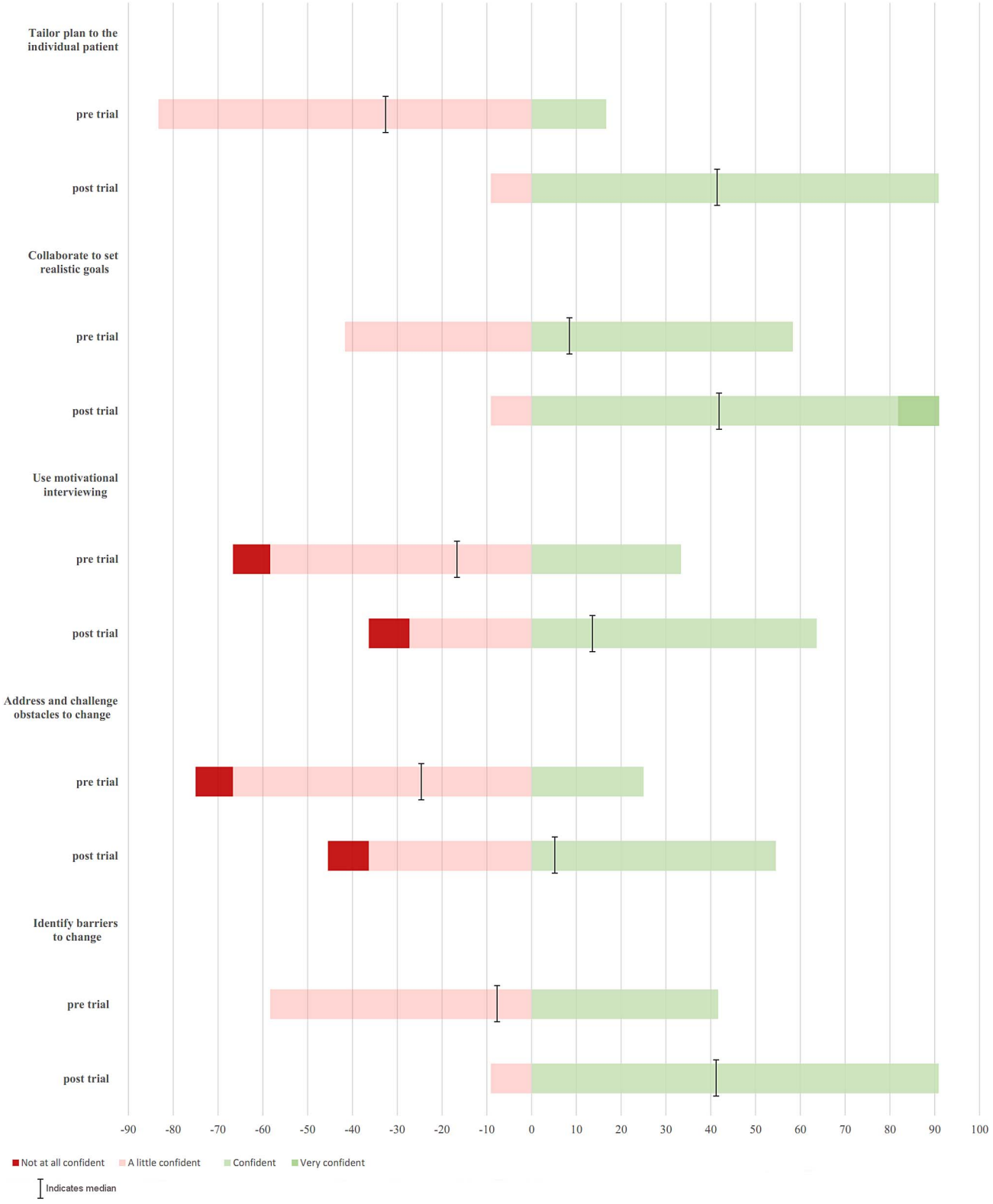

Figure 3 Survey results for general practitioners (GPs) pre and postpilot study relating to GP efficacy expectations in the 'Assist' and 'Arrange' categories of the 5As framework. Light red, a little confident; dark red, not at all confident; light green, confident; dark green, very confident. Black line indicates the median value.

people are actually relieved and grateful when you do that for them. And I guess before I thought they would be more embarrassed or upset, when they're not, that's what they want. They talk to me about it. (GP-SP)

DISCUSSION

We have shown an increase in GPs' confidence and self-efficacy by providing them with a structured toolkit for the management of obesity. This increase was

demonstrated in the results from the quantitative survey as well as the qualitative interview data. In the interviews, GPs identified the structure and support provided by The Change Programme materials as the key reason that they felt more confident after the pilot intervention. This improved confidence is consistent with efficacy expectations in SCT which describes a person's belief that their actions will be effective in leading to behaviour change. In this case, the GPs' actions working with a patient, resulting in the patient's behaviour change.

The most encouraging result was the change in usual clinical practice reported by the GPs in the interviews. They reported using their skills from the pilot trial with other patients outside the research setting. They were more confident to ask and assess patients for obesity management knowing they had skills to offer. This 'performance mastery' experience for the GPs fits with SCT. The GP has had a positive experience managing a patient with obesity leading to increased GP 'professional self-efficacy' to assist patients to change their behaviour. This has flowed into regular daily practice with the GPs reporting increased ease in discussing obesity and management options with patients who were not part of the pilot study.

It is notable that the 'Assist' items (related to goal setting, identifying barriers and using motivational interviewing techniques) on the questionnaire showed the greatest change in GP confidence. This is possibly due to the structured approach provided by The Change Programme that gave the GPs a new process for working with patients. It has been found in other obesity intervention studies in consultations that progress to the 'Assist' and 'Arrange' stages of the 5As framework are associated with the greatest patient lifestyle change.[16 30] The improvement in GP confidence seen with The Change Programme leads to the GP feeling more comfortable initiating conversations and discussing management. This is the initial, critical step on the path towards facilitating actual patient behaviour change.[31]

Often interventions to improve GP care of patients with obesity focus on encouraging GPs to ask their patients for permission to talk about obesity.[14 17 30] The approach of our pilot intervention was somewhat different where we supported GPs with the 'Assist' and 'Arrange' parts of the framework and in doing so, some GPs found their increase in confidence led to them talking to more of their patients about obesity. This alternative approach may be more successful in empowering GPs to speak to more patients about obesity as they are confident and have self-efficacy for managing patients with obesity.

The generalisability of these findings is limited by the small sample of self-selecting GPs and it is likely these GPs have a particular interest in obesity care. Further work on the effectiveness of The Change Programme should aim to recruit a broad range of GPs in different styles of practices to ensure that the programme applies to a variety of practitioners. The improvement in GP self-efficacy and confidence seen in the quantitative survey which was then supported by the qualitative data is a strength of this study.

The Change Programme focuses obesity management within the general practice setting. It is reliant on a strong therapeutic relationship between a patient and their GP. In some international primary care settings, this approach is not in line with current trends of GP care being delegated to other professionals or entirely moved out of the GP care space.[32] Our findings that GP self-efficacy can be improved and their practice changed using a structured approach to obesity management are noteworthy, and the principles could be applied to suit local settings. Further study is needed to determine the cost-effectiveness of reducing fragmentation of care and whether GPs can deliver improved outcomes over the longer term for patients with obesity.

This study provides a unique insight into the possibility of changing GPs' confidence and self-efficacy for obesity management by providing them with a structured tool. By assisting them to achieve a 'performance mastery' experience, the GPs' confidence levels were improved to a point where they offered more to their patients outside the research setting. It is possible to improve GPs' confidence and self-efficacy for obesity management using a structured management programme.

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Contributors ES, EH, NE, CvW and KD contributed to the design of this study. Acknowledgement to Dr Freya Ashman who collected the data. ES and NE analysed the qualitative data. EH designed the graphs for the presentation of the quantitative data. ES wrote the original draft and was responsible for reviewing each draft until finalisation. ES, EH, NE, CvW and KD contributed to the editing of the manuscript and approved the final version.

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REFERENCES

1. World Health Organisation. *Global report on diabetes*. France, 2016.
2. Colagiuri S, Lee CMY, Colagiuri R, *et al*. The cost of overweight and obesity in Australia. *Med J Aust* 2010;192:260–4.
3. Ball L, Johnson C, Desbrow B, *et al*. General practitioners can offer effective nutrition care to patients with lifestyle-related chronic disease. *J Prim Health Care* 2013;5:59–69.

4. Ball L, Desbrow B, Leveritt M. An exploration of individuals' preferences for nutrition care from Australian primary care health professionals. *Aust J Prim Health* 2014;20:113–20.
5. Jansen S, Desbrow B, Ball L. Obesity management by general practitioners: the unavoidable necessity. *Aust J Prim Health* 2015;21:366–8.
6. Royal Australian College of General Practitioners. *Guidelines for preventive activities in general practice*. 8th edn. East Melbourne, 2012.
7. Royal College of General Practitioners. Healthy People: promoting health and preventing disease in RCGP Curriculum, Professional and Clinical Modules. Royal College of General Practitioners, London, 2016.
8. Tannenbaum D, Konkin J, Parsons E, *et al*. *CanMEDS-Family Medicine: working group on curriculum review*. The College of Family Physicians of Canada, 2009.
9. *Family Medicine: report of a regional scientific working group meeting on core curriculum*. New Delhi: World Health Organisation, 2003.
10. Zwar NA, Richmond RL. Role of the general practitioner in smoking cessation. *Drug Alcohol Rev* 2006;25:21–6.
11. Campos-Outcalt D, Jeffcott-Pera M, Carter-Smith P, *et al*. Vaccines provided by family physicians. *Ann Fam Med* 2010;8:507–10.
12. van Dillen SM, Hiddink GJ, Koelen MA, *et al*. Perceived relevance and information needs regarding food topics and preferred information sources among Dutch adults: results of a quantitative consumer study. *Eur J Clin Nutr* 2004;58:1306–13.
13. Harris MF, Zwar NA. Care of patients with chronic disease: the challenge for general practice. *Med J Aust* 2007;187:104–7.
14. Carvajal R, Wadden TA, Tsai AG, *et al*. Managing obesity in primary care practice: a narrative review. *Ann N Y Acad Sci* 2013;1281:191–206.
15. Ashman F, Sturgiss E, Haesler E. Exploring self-efficacy in Australian general practitioners managing patient obesity: a qualitative survey study. *Int J Family Med* 2016;2016:8212837.
16. Vallis M, Piccinini-Vallis H, Sharma AM, *et al*. Clinical review: modified 5 As: minimal intervention for obesity counseling in primary care. *Can Fam Physician* 2013;59:27–31.
17. Rueda-Clausen CF, Benterud E, Bond T, *et al*. Effect of implementing the 5As of obesity management framework on provider-patient interactions in primary care. *Clin Obes* 2014;4:39–44.
18. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot* 1997;12:38–48.
19. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev* 1977;84:191–215.
20. Bandura A. *Self efficacy: the exercise of control*. Stanford, USA: Stanford University, 1997:382.
21. National Health and Medical Research Council. *Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia*. Melbourne: National Health and Medical Research Council, 2013.
22. Sturgiss E, Douglas K, Kathage R, *et al*. A synthesis of selected national Australian guidelines on the general practice management of adult patients who are overweight or obese. *Aust Fam Physician* 2016;45:327–31.
23. Sturgiss EA, Douglas K. A collaborative process for developing a weight management toolkit for general practitioners in Australia-an intervention development study using the Knowledge To Action framework. *Pilot Feasibility Stud* 2016;2:20.
24. Barlow J, Wright C, Sheasby J, *et al*. Self-management approaches for people with chronic conditions: a review. *Patient Educ Couns* 2002;48:177–87.
25. Kelley JM, Kraft-Todd G, Schapira L, *et al*. The influence of the patient–clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PLoS ONE* 2014;9:e94207.
26. Block JP, DeSalvo KB, Fisher WP. Are physicians equipped to address the obesity epidemic? Knowledge and attitudes of internal medicine residents. *Prev Med* 2003;36:669–75.
27. Jay M, Gillespie C, Ark T, *et al*. Do internists, pediatricians, and psychiatrists feel competent in obesity care? *J Gen Intern Med* 2008;23:1066–70.
28. Visser F, Hiddink G, Koelen M, *et al*. Longitudinal changes in GPs' task perceptions, self-efficacy, barriers and practices of nutrition education and treatment of overweight. *Fam Pract* 2008;25(Suppl 1): i105–11.
29. Sturgiss EA, Elmitt N, Haesler E, *et al*. Feasibility and acceptability of a physician-delivered weight management programme. *Fam Pract* 2016:cmw105.
30. Alexander SC, Cox ME, Boling Turer CL, *et al*. Do the five A's work when physicians counsel about weight loss? *Fam Med* 2011;43:179–84.
31. Sim M, Wain T, Khong E. Influencing behaviour change in general practice. Part 1—brief intervention and motivational interviewing. *Aust Fam Physician* 2009;38:885–8.
32. Aveyard P, Lewis A, Tearne S, *et al*. Screening and brief intervention for obesity in primary care: a parallel, two-arm, randomised trial. *Lancet* 2016;388:2492–500.

Chapter 7

The 5As model in obesity management in primary care – do we need a more intricate model?

Reference: Sturgiss E, van Weel C. The 5 As framework for obesity management Do we need a more intricate model? Canadian Family Physician 2017;63(7):506-08.

The "5As model" has become the standard approach to behaviour change in primary care. First developed in the USA as an approach to smoking cessation, it has been transferred into obesity care and other health issues that require behaviour change. This paper is a conceptual discussion about suggested improvements to the model. Informed by the results of the feasibility trial, this paper suggests that the model would be improved by making person-centredness more prominent, and acknowledging the therapeutic role of a trusted relationship with a health practitioner. The adoption of this modified 5As approach would change the way research was conducted and analysed in obesity management, as well as altering the way behaviour change consultations are taught to trainees and medical students.

The definition of person-centred care in this article was based on the 2011 Starfield paper on patient-centred versus person-focused care where I directly transferred the use of "person-focused" to mean person-centred.[1] The academic literature does not contain further reference to person-focused care since Starfield's work. Person-centred care is more commonly used in health promotion literature and patient-centred care more often in medical models,[2] but both are often used interchangeably. A more comprehensive definition of patient-centred care is given in the Cochrane systematic review in 2012 (Dwamena, et al)[3], although it should be noted that this is a review of healthcare generally and not specific to primary care. The review recognises that there are varying definitions of the concept, and they defined patient-centred care by the presence of two factors:

1. *"healthcare providers share control of consultations, decisions about interventions or the management of the health problems with patients, and/or*
2. *healthcare providers focus on the patient as a person, rather than solely on the disease, in consultations."*[3]

The systematic review noted the heterogeneity in the interventions studied – most of the interventions were developed in the US.[3] Overall, interventions successfully trained providers in patient-centred care skills, but had mixed effects on patient satisfaction and health behaviours. Interventions that were targeted at both providers and patients possibly have more consistent effects.[3]

References

1. Starfield B. Is Patient-Centered Care the Same As Person-Focused Care? *The Permanente Journal* 2011; **15**(2): 63-9.
2. Brouwers M, Rasenberg E, van Weel C, Laan R, van Weel-Baumgarten E. Assessing patient-centred communication in teaching: a systematic review of instruments. *Medical education* 2017; **51**(11): 1103-17.
3. Dwamena F, Holmes-Rovner M, Gaulden CM, et al. Interventions for providers to promote a patient-centred approach in clinical consultations. *The Cochrane database of systematic reviews* 2012; **12**: Cd003267.

The 5 *A*s framework for obesity management

Do we need a more intricate model?

Elizabeth Sturgiss FRACGP FHEA MPH MForensMed **Chris van Weel** MD PhD

Family doctors are often involved in assisting patients with behaviour change. The 5 *A*s framework has become the universal approach to teaching and practising the art of encouraging behaviour change (**Figure 1**).[1] It is championed for its simplicity and easy-to-remember acronym. In Australia, it is applied within general practice in the prevention guidelines for smoking, nutrition, alcohol, and physical activity advice.[2]

The 5 *A*s model originates from the US Department of Health and Human Services, where it was developed as a framework for encouraging smoking cessation.[3] The framework is informed by the transtheoretical model of behaviour change first proposed by Prochaska and DiClemente.[4] Its strength is in taking the individual perceived need as the starting point, which makes it possible to direct the process of care toward the patient and his or her personal situation. Since being developed specifically for smoking cessation, the model's approach has been transferred to obesity management.[1,5] This model has served well as an initial descriptor of a process that occurs between a clinician and patient for behaviour change. However, the 5 *A*s model could be further developed to reflect more explicitly the complexity of patient behaviour change in obesity management.

Further development of an existing approach

The linear, sequential 5 *A*s model implies that assisting patients in behaviour change is a streamlined and straightforward process; however, this misinforms both learners and experienced clinicians, as assisting behaviour change is perhaps the most complicated task that a clinician can undertake. It is not simple to help a person identify changes he or she wants to make to his or her behaviour, and it is even more complex to determine appropriate goals for the person and how changes should be implemented. The current 5 *A*s model does not explicitly acknowledge that some patients will not be ready to progress into the *assessment* phase and that this should be respected. A model that better reflects the complexities of behaviour change is needed.

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Can Fam Physician 2017;63:506-8

La traduction en français de cet article se trouve à **www.cfp.ca** dans la table des matières du numéro **de juillet 2017** à la **page e330**.

Figure 1. The 5 *A*s framework*

*In Canada, the United States, the United Kingdom, and Australia, the 5 *A*s might represent slightly different verbs (eg, *assist* in Canada and the United States is *arrange* in Australia).

The 5 *A*s model has been a helpful approach in starting to understand the process for behaviour change. However, the simplistic representation of the process has led some research and teaching to suggest that a stepwise progression through the 5 *A*s for each patient is needed. Experts in the field are aware that this was not the intention of the developers of the model. But the representation of the model with the 5 *A*s does not make this clear for the learner or non-expert in behaviour change. To further develop research and teaching in this area, we suggest the following changes to the representation of the 5 *A*s model:

- using patient-centred language,
- taking a person-centred approach, and
- acknowledging the importance of a strong therapeutic relationship.

Patient-centred language. The importance of patient-centred language in clinical practice has been linked to patient satisfaction and better communication outcomes.[6] Overall, the 5 *A* verbs in the model are not collaborative or patient-centred—they describe processes that you "do to" someone rather than "do with" someone. When the 5 *A*s in obesity care are particularized, the description is collaborative and reflective of motivational interviewing processes.[1] For example, the *ask* phase of the 5 *A*s model might be better represented by *seek permission*. This clearly conveys the expectation of the initial phase of the process. The simple *A* verbs do not convey the importance of partnership in the process, and the model would be improved with the use of more collaborative verbs.

Person-centredness. Person-centredness is a concept that was fully explained by Starfield in 2011.[7] She described person-focused care as a unique concept that was different from patient-centred care. With person-focused care,[8,9] the care of a person takes place over time, with a focus on the whole person rather than

interrelated disease processes, and the person's health beliefs, cultural values, and lived experiences become central to the management planning. A person's experience of health care and his or her sense of well-being is the primary outcome of all care. Placing person-centredness at the core of a modified 5 *A*s model highlights the importance of this approach when we are aiming to improve a person's sense of his or her own health. This is principally important, as person-centredness has been related to positive health outcomes.[10]

Studies in primary health care that correlate consultations with the 5 *A*s process are described as successful only if the practitioner discusses every stage of the 5 *A*s.[11] Studies have repeatedly noted that practitioners most often *ask* and *assess*, but less frequently move to the *advise, agree,* and *arrange* or *assist* phases.[12] This simplified view of the process does not recognize that for some patients, moving beyond the initial phases in a consultation is not appropriate. This view also overlooks that conversations about change do not need to occur in one consultation. Change over time is recognized in some research[13] but not all, and is often overlooked when attempting to simplify the process when teaching learners. If a patient does not wish to discuss obesity or there are other more pressing concerns, the practitioner could be practising excellent, person-centred health care by not moving forward into further phases.

Therapeutic relationship. The therapeutic relationship between a practitioner and client has been well recognized in psychotherapy as a mediator for behaviour change.[14] A strong therapeutic relationship is seen when there is mutual respect between the parties, an ability to collaborate on goal setting, and agreement on the best way to achieve the goals.[15] There are increasing examples in the medical literature of a strong therapeutic relationship being associated with better patient outcomes.[16] The 5 *A*s model could be improved with the recognition of the all-encompassing nature of a strong therapeutic alliance in assisting patients in behaviour change. The current model does not include this concept and gives the impression that anyone could *ask, assess, advise,* and *arrange* with the same success in patient behaviour change. This approach is unlikely to be true.[17]

The current 5 *A*s framework is not reflective of continuity of care that is central to primary care. A strong therapeutic relationship bridges time in that it allows individuals to adapt to the challenges in their lives, recognize their priorities, and temporarily (or permanently) decline to pursue an intervention. Continuity of care is associated with improved uptake of preventive care such as lifestyle interventions.[18] A model that more closely reflects the strengths of primary care, using continuity of care and person-centredness, is likely to better reflect the needs of the individual rather than the constraints of a framework.

Proposed model

The 5 *A*s model could be made circular to better align with the real complexities of patient behaviour change (**Figure 2**). The proposed model is encased in the therapeutic relationship recognizing the important strength this brings in patient behaviour change. Replacing *A* verbs with actions that are more collaborative and person-centred (eg, set goals) is aligned with current theories of patient-centred care and shared decision making. Explicitly outlining the good practice of desisting in the process if a patient does not give permission is essential. Person-centredness is the centrepiece of the model, acknowledging the fundamental role of this value. By adding the *follow-up* phase, along with a view of the model over time (**Figure 3**), it is explicit that the journey with a patient through behaviour change occurs over time, at a pace that suits the patient's needs.

Conclusion

Moving away from a linear, simplified model will better recognize the truly complex nature of assisting patients in behaviour change. It is not necessarily a "failure" when a consultation does not progress through all 5 stages of the 5 *A*s framework and this should be reflected in ongoing research in obesity care. By presenting the 5 *A*s without reference to the patient's context, it has at times, in research and teaching, been used as a simple "tick box" list. By connecting the 5 *A*s to person-centredness, more justice is done to the underlying

Figure 2. Proposed model for the management of obesity within each consultation

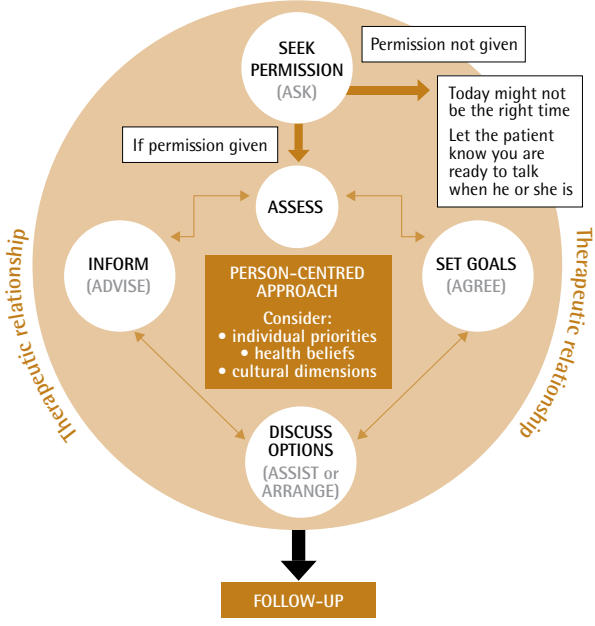
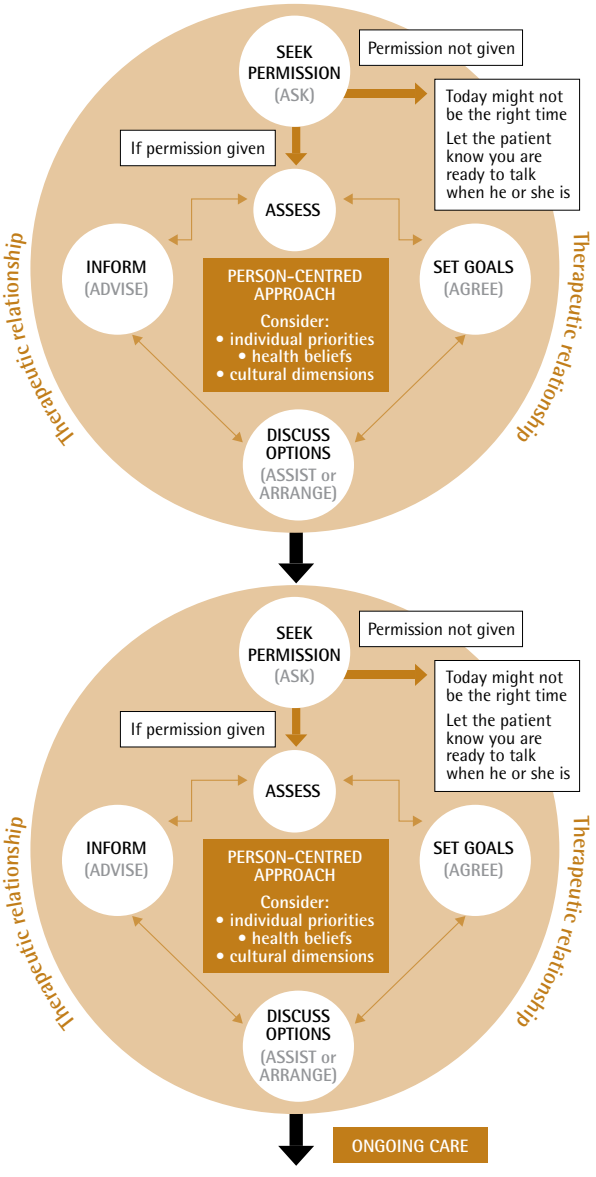


Figure 3. Proposed model for the management of obesity in primary care over time



strength of the transtheoretical model of behaviour change and the actions of the 5 *As* are explicitly connected to the values of primary care. This modified model of the 5 *As* could be used to inform future obesity research and teaching on supporting patient behaviour change in primary care.

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Competing interests
None declared

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References

1. Vallis M, Piccinini-Vallis H, Sharma AM, Freedhoff Y. Modified 5 *As*. Minimal intervention for obesity counseling in primary care. *Can Fam Physician* 2013;59:27-31 (Eng), e1-5 (Fr).
2. Sim MG, Wain T, Khong E. Influencing behaviour change in general practice. Part 1—brief intervention and motivational interviewing. *Aust Fam Physician* 2009;38(11):885-8.
3. Tobacco Use and Dependence Guideline Panel. *Treating tobacco use and dependence: 2008 update.* Rockville, MD: US Department of Health and Human Services; 2008.
4. Prochaska JO, DiClemente CC. Stages and processes of self-change in smoking: toward an integrative model of change. *J Consult Clin Psychol* 1983;51(3):390-5.
5. Rao G. Office-based strategies for the management of obesity. *Am Fam Physician* 2010;81(12):1449-56.
6. King A, Hoppe RB. "Best practice" for patient-centered communication: a narrative review. *J Grad Med Educ* 2013;5(3):385-93.
7. Starfield B. Is patient-centered care the same as person-focused care? *Perm J* 2011;15(2):63-9.
8. Mezzich J, Snaedal J, van Weel C, Heath I. Toward person-centered medicine: from disease to patient to person. *Mt Sinai J Med* 2010;77(3):304-6.
9. Reeve J, Dowrick CF, Freeman GK, Gunn J, Mair F, May C, et al. Examining the practice of generalist expertise: a qualitative study identifying constraints and solutions. *JRSM Short Rep* 2013;4(12):1-9.
10. Stewart M, Brown JB, Donner A, McWhinney IR, Oates J, Weston WW, et al. The impact of patient-centered care on outcomes. *J Fam Pract* 2000;49(9):796-804.
11. Sherson EA, Yakes Jimenez E, Katalanos N. A review of the use of the 5 A's model for weight loss counselling: differences between physician practice and patient demand. *Fam Pract* 2014;31(4):389-98. Epub 2014 Jun 2.
12. Alexander SC, Cox ME, Boling Turer CL, Lyna P, Østbye T, Tulsky JA, et al. Do the five A's work when physicians counsel about weight loss? *Fam Med* 2011;43(3):179-84.
13. Schlair S, Moore S, McMacken M, Jay M. How to deliver high-quality obesity counseling in primary care using the 5As framework. *J Clin Outcomes Manag* 2012;19(5):221-9.
14. Bachelor A, Horvath A. The therapeutic relationship. In: Hubble MA, Duncan BL, Miller SD, editors. *The heart and soul of change. What works in therapy*. Washington, DC: American Psychological Association; 1999. p. 133-77.
15. Bordin ES. The generalizability of the psychoanalytic concept of the working alliance. *Psychother Theory Res Prac* 1979;16(3):252-60.
16. Bennett WL, Wang NY, Gudzune KA, Dalcin AT, Bleich SN, Appel LJ, et al. Satisfaction with primary care provider involvement is associated with greater weight loss: results from the practice-based POWER trial. *Patient Educ Couns* 2015;98(9):1099-105. Epub 2015 May 27.
17. Kelley JM, Kraft-Todd G, Schapira L, Kossowsky J, Riess H. The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PLoS One* 2014;9(4):e94207.
18. Gray DP, Evans P, Sweeney K, Lings P, Seamark D, Seamark C, et al. Towards a theory of continuity of care. *J R Soc Med* 2003;96(4):160-6.

Chapter 8

Therapeutic alliance and obesity management in primary care - a cross-sectional pilot using the Working Alliance Inventory

Reference: Sturgiss EA, Sargent GM, Haesler E, Rieger E, Douglas K. Therapeutic alliance and obesity management in primary care - a cross-sectional pilot using the Working Alliance Inventory. Clinical Obesity 2016;6(6):376-79 doi: 10.1111/cob.12167.

The therapeutic relationship is a construct that has been most widely studied in psychology. It is recognised that a strong relationship between a provider and patient contributes to the improvement in a patient's wellbeing. An empirical review of the conceptualisation and measurement of therapeutic alliance in psychology found that the Working Alliance was associated with improved psychological outcomes.[1] Further, the original paper by Bordin describing the Working Alliance specifically highlights that this concept is applicable to all relationships where one party is attempting to assist another. It was this call for the framework to be applied in other settings than psychology by the original author that made the theory attractive for general practice. As mentioned in the coming paper, it has been applied in some medical settings with promising results.

Many measures of "doctor-patient relationship" focus solely on the trust and respect between the two parties. However, Bordin's model from psychology emphasises the three specific factors that are needed for a strong therapeutic alliance:

1. Bond
2. Collaborative goal setting
3. Agreement on the required tasks.

Bordin's model has been used to construct a quantitative measure called the Working Alliance Inventory (WAI) and it has been found to correlate with client outcomes in adult psychology. This paper describes the application of the WAI to patients and GPs in the feasibility trial of The Change Program.

Reference

1. Elvins R, Green J. The conceptualization and measurement of therapeutic alliance: An empirical review. *Clinical Psychology Review* 2008; **28**(7): 1167-87.

doi: 10.1111/cob.12167

Therapeutic alliance and obesity management in primary care – a cross-sectional pilot using the Working Alliance Inventory

E. A. Sturgiss[1], G. M. Sargent[2], E. Haesler[1], E. Rieger[3] and K. Douglas[1]

What is already known about this subject

- Primary health care has a role in the prevention of chronic diseases associated with obesity.
- Primary health care is built on relationship-based care between practitioners and patients.
- There is great variability in the effectiveness of evidence-based interventions for obesity when applied in primary health care.

What this study adds

- The Working Alliance Inventory (short revised version) can be used to measure therapeutic alliance between practitioners and patients.
- The Working Alliance Inventory was related to appointment attendance and some health outcomes in this cross-sectional pilot study.
- Applying therapeutic alliance theory to obesity interventions in primary health care may predict patient outcomes.

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Summary

Therapeutic alliance is a well-recognized predictor of patient outcomes within psychological therapy. It has not been applied to obesity interventions, and Bordin's theoretical framework shows particular relevance to the management of obesity in primary health care. This cross-sectional study of a weight management programme in general practice aimed to determine if therapeutic alliance was associated with patient outcomes. The Working Alliance Inventory short revised version (WAI-SR) was administered to 23 patients and 11 general practitioners (GPs) at the end of a 6-month weight management programme. Use of the WAI-SR indicated that the strength of therapeutic alliance varied between different patient–GP relationships in this pilot intervention. A robust therapeutic alliance was strongly associated with patient engagement in the weight management programme indicated by number of appointments. It was also associated with some general health and quality of life outcomes. These are promising results that require confirmation with larger studies in primary health care. The measurement of therapeutic alliance using the WAI-SR may predict patient attendance and outcomes in obesity interventions in primary healthcare settings.

Keywords: Obesity, primary care, professional–patient relations, physician–patient relations.

Introduction

Currently, we cannot explain why evidence-based interventions in primary health care succeed in achieving clinically significant outcomes for some patients with obesity but not others. The importance of the physician–patient relationship has been recognized since the time of Hippocrates and continues to be honoured in the modern Hippocratic Oath: 'I will remember that there is art to medicine as well as science, and that warmth, sympathy, and understanding may outweigh the surgeon's knife or the chemist's drug' (1). The strength of the relationship between a healthcare practitioner and patient may be an important predictor of the effectiveness of obesity management in primary health care.

The relationship between a healthcare practitioner and patient has been conceptualized through the therapeutic

alliance framework. Therapeutic alliance has been recognized as an important mediator of behaviour change in psychotherapy (2). It is thought to lead to behaviour change partly by facilitating the patient's full participation in therapy, with trust in the healthcare practitioner, enabling the patient to embrace the proposed treatment (3). Therapeutic alliance can be responsible for 8% variation in the outcome of psychotherapy (4), which is more than has been attributed to any specific form of psychotherapy.

In 1979, Bordin published on what he termed 'working alliance', describing the fundamental characteristics of the therapeutic alliance (5). He maintained that the therapeutic alliance is applicable to any relationship between a 'change seeker' and a 'change agent' (5). He described the therapeutic alliance 'as including three features: an agreement on goals, an assignment of task or a series of tasks, and the development of bonds' ((5), p. 253). Thus, Bordin's theory of the therapeutic alliance encompasses proposed treatment (i.e., goals and tasks) and the environment in which it is delivered (i.e., bonds) within one unifying framework.

Bordin's tripartite conceptualization of the therapeutic alliance is consistent with best practice for obesity management in primary health care (6):

1. Goals — target outcomes that are mutually agreed, realistic, achievable and have a specified duration. These principles of goal setting are already applied in primary health care, including chronic disease management and prevention (7).
2. Tasks — a series of specific steps that the healthcare practitioner and/or patient need to undertake in working towards achieving the agreed-upon goals (6).
3. Bond — an unconditional positive regard for the patient is a well-recognized component of a strong therapeutic alliance (8). A trusted primary healthcare practitioner who engages in ongoing, individualized care (9) is ideally situated for the long-term nature of obesity management.

A comparable effect may be expected in primary health care, where healthcare practitioners are helping patients with obesity to change their lifestyle behaviours. Yet a literature search using key search terms (obesity, therapeutic relationship/alliance, primary care, general/family practice) in medical and psychological databases (PubMed, CINAHL, PsycINFO) has not identified any obesity research conducted to date investigating the role of therapeutic alliance for primary healthcare outcomes in patients with obesity. Therapeutic alliance is of particular relevance to the primary healthcare setting as patients are more likely to have existing relationships with practitioners that can be harnessed to support behaviour change.

While it has not been evaluated in the obesity context, the therapeutic relationship as described by Bordin has been measured in two other medical settings. It was measured in patients attending a Canadian primary care service using a patient-centred care framework, with a strong alliance found to predict patient satisfaction, enablement and intent to adhere to therapy (10). It was also measured in American patients with chronic illness and found to correlate with patient satisfaction and intention to adhere to treatment (11). The alliance has not been correlated with patient health outcomes.

One of the tools for measuring the therapeutic alliance is the Working Alliance Inventory (WAI), which has been validated for psychotherapy outcomes in adults. It was developed to measure the three facets of the therapeutic alliance described by Bordin, and the original inventory consists of 36 questions answered by the practitioner, patient and an external observer (12). A revised short version (WAI-SR) has also been tested for reliability and validity (13). The aim of this study is to determine if the WAI-SR is related to patient outcomes in a pilot study of a weight management programme in general practice.

Materials and methods

This cross-sectional study was completed by participants in a 6-month pilot implementation trial of a weight management programme in Australian general practice (14,15). This programme supported general practitioners (GPs) to work in a structured format using a patient workbook and GP handbook with their patients with obesity. Consultations were bi-monthly for the first 3 months and reduced to every 4–6 weeks depending on the patient's needs. The ethical aspects of this study were approved by the Australian National University Human Ethics Research Committee.

Self-selecting GPs were asked to recruit two of their patients who had attended the practice at least three times in past 2 years. Patients were eligible if they were over the age of 18, had a body mass index (BMI) between 25 and 40 kg m^2, had no uncontrolled medical or mental health condition, had at least an intermediate lifetime risk of diabetes as measured by Australian Diabetes Risk Score and had no plans for bariatric surgery or anti-obesity medications. Across five general practices, 23 patients and 11 GPs participated in the study.

After 6 months of participating in the programme, both patients and their GPs completed the WAI-SR. The WAI-SR uses a five-point Likert scale to rate questions, which are then added to give an overall score. In addition, overall functional health status was measured by GPs using the World Organization of General Practice/Family Physicians functional status charts (WONCA/COOP scale) (16), and quality of life was measured by patients through the Impact of Weight on Quality of Life-Lite (IWQOL-Lite) (17). WONCA uses a five-point Likert scale, and IWQOL uses a

Table 1 Baseline characteristics of the patients and general practitioners

Variable	Results
Patients	
Gender	Female = 20
	Male = 3
Age (years)	<45 years = 8
	45–54 years = 9
	55–64 years = 6
Previous weight loss attempts	Yes = 17
	No = 1
	Not recorded = 5
Weight (kg)	*M* = 100.2 (median = 97.8)
	SD = 12.1 (range = 78.2–134.1)
Body Mass Index (kg m^{-2})	*M* = 35.7 (median = 35.1)
	SD = 3.3 (range = 29.2–42.9)
Waist circumference (cm)	*M* = 108.5 (median = 108)
	SD = 8.4 (range = 90–132)
General practitioners	
Gender	Female = 8
	Male = 3
Experience (years)	*M* = 12 years
	SD = 8.1 (range = 4–30)

M, mean; *SD*, standard deviation.

percentage score, with a higher score indicative of greater health or less impact of obesity on quality of life.

Using Pearson correlation coefficients, mean GP and patient WAI-SR scores were correlated with the following outcome measures: number of appointments, percentage weight loss from baseline to 6 months, functional status and quality of life measures.

Results

The baseline characteristics of the patients and GPs involved are shown in Table 1. As shown in Tables 2 and 3, respectively, both the GP and patient WAI-SR scores were correlated with the number of appointments attended by the patient. The GP WAI-SR scores were also significantly correlated with the emotional and social scores on the overall functional scale with moderate effect size (see Table 2). The patient WAI-SR scores were significantly correlated with the patient's ability to carry out usual daily activities as measured by the WONCA, as well as physical function and self-esteem scores on the IWQOL-Lite (see Table 3).

There were a number of outcomes that were negligibly related to the WAI-SR for GPs (ability to carry out usual activities, physical activity, wellness in past 2 weeks, work-related and public distress) and patients (physical activity, work-related and public distress) (18). There were fewer items of negligible correlation in the patient measures compared to GP measures.

Table 2 Correlations between the Working Alliance Inventory (short revised) by general practitioners and outcome measures at 6 months

Outcome measure	Pearson correlation	*P-value (2-tailed)*
% change in weight from baseline (*n* = 22)	0.323	0.142
Total number of appointments (*n* = 23)	0.538	0.008 *
WONCA – general health (*n* = 15)	0.322	0.242
WONCA – usual activities (*n* = 15)	0.283	0.307
WONCA – physical activity (*n* = 15)	0.246	0.376
WONCA – emotional (*n* = 15)	0.663	0.007*
WONCA – social (*n* = 15)	0.546	0.035*
WONCA – overall well-being in past 2 weeks (*n* = 15)	0.197	0.482
QOL – physical function (*n* = 15)	0.438	0.103
QOL – self-esteem (*n* = 15)	0.397	0.143
QOL – public distress (*n* = 15)	−0.182	0.516
QOL – work-related (*n* = 15)	−0.220	0.432

WONCA, World Organization of General Practice/Family Physicians functional status charts; QOL, Impact of Weight on Quality of Life-Lite; WAI-SR, Working Alliance Inventory, short revised; GP, general practitioner; *n*, number of participants (GP and patient dyads).

Discussion

This is the first study to use the WAI-SR to measure the strength of the therapeutic alliance in the management of obesity in primary care. Both the patients' and GPs' WAI-SR scores indicated that the strength of the therapeutic alliance was positively associated with the number of appointments attended. This finding is noteworthy given that one of the greatest challenges in weight management

Table 3 Correlations between the Working Alliance Inventory (short revised) by patients and outcome measures at 6 months

Outcome measure	Pearson correlation	*P*-value (2-tailed)
% change in weight from baseline (*n* = 19)	0.414	0.078
Total number of appointments (*n* = 19)	0.783	<0.001*
WONCA – general health (*n* = 15)	0.484	0.068
WONCA – usual activities (*n* = 15)	0.623	0.013*
WONCA – physical activity (*n* = 15)	0.034	0.903
WONCA – emotional (*n* = 15)	0.487	0.066
WONCA – social (*n* = 15)	0.314	0.255
WONCA – overall well-being in past 2 weeks (*n* = 15)	0.325	0.238
QOL – physical function (*n* = 15)	0.570	0.027*
QOL – self-esteem (*n* = 15)	0.628	0.012*
QOL – public distress (*n* = 15)	0.011	0.970
QOL – work-related (*n* = 15)	−0.094	0.738

WONCA, World Organization of General Practice/Family Physicians functional status charts; QOL, Impact of Weight on Quality of Life-Lite; WAI-SR, Working Alliance Inventory, short revised; *n*, number of participants (GP and patient dyads).

programmes is the engagement and retention of patients, with dropout rates of approximately 50% being common (19,20). The current finding suggests that the therapeutic alliance is a potential mediating factor in dropout rates that has not been previously identified (21).

The present study found that the strength of the therapeutic alliance was also associated with a range of outcome measures, including the ability to carry out usual activities, emotional well-being and self-esteem. Other general health and quality of life measures were somewhat correlated, with the small sample size limiting interpretation. These promising results regarding relationships between the WAI-SR and obesity health outcomes require further evaluation in larger studies.

As a pilot project, this study is limited by the sample size. We have chosen to publish these promising findings in the hope that other researchers will apply the WAI-SR in their own trials. Future applications of the WAI-SR would be best undertaken longitudinally to assess relationships between therapeutic alliance and outcomes over time. Indexing a broader range of outcome measures, such as reductions in metabolic risk factors, would also be beneficial.

These preliminary findings highlight the therapeutic alliance as an unexplored, but potentially noteworthy, construct in understanding the variability in outcomes for patients with obesity in primary healthcare settings. Should further research confirm this important finding, the strengthening of the practitioner–patient therapeutic alliance will be a means for enhancing obesity-related outcomes in primary health care.

Conflicts of Interest Statement

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ES and GS conceived the theoretical basis for the work. ES, EH and KD were involved in the study design. ER was involved in the application of the WAI-SR to the study. ES and EH were involved in the data analysis. ES wrote the initial draft of the manuscript. All authors were involved in the writing after the initial draft and had final approval of the submitted and published version.

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References

1. Lasagna L. *Modern Hippocratic Oath*. : Boston, MA, 1964.
2. Elvins R, Green J. The conceptualization and measurement of the therapeutic alliance: an empirical review. *Clin Psychol Rev* 2008; **28**: 1167–1187.
3. Horvath A, Greenberg L. *The Working Alliance: Theory, Research and Practice*. Wiley: New York, 1994.
4. Hiskey S. Time to re-evaluate the therapeutic relationship. *Mental Health Pract* 2012; **15**: 34–35.
5. Bordin ES. The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy (Chic)* 1979; **16**: 252–260.
6. National Health and Medical Research Council. *Summary Guide for the Management of Overweight and Obesity in Primary Care*. National Health and Medical Research Council: Melbourne, 2013.
7. Lawn S, Schoo A. Supporting self-management of chronic health conditions: common approaches. *Patient Educ Couns* 2010; **80**: 205–211.
8. Hall JA, Horgan TG, Stein TS, Roter DL. Liking in the physician-patient relationship. *Patient Educ Couns* 2002; **48**: 69–77.
9. Starfield B, Wray C, Hass K *et al.* The influence of patient-practitioner agreement on outcomes of care. *Am J Public Health Res* 1981; **71**: 127–131.
10. Chan A. *The Working Alliance as a Conceptual Framework of Patient-Centredness: The Development of the Primary Care Working Alliance Inventory*. University of Western Ontario: London, 2008.
11. Fuertes JN, Mislowack A, Bennett J *et al.* The physician-patient working alliance. *Patient Educ Couns* 2007; **66**: 29–36.
12. Horvath AO, Luborsky L. Development and validation of the Working Alliance Inventory. *J Couns Psychol* 1989; **36**: 223–233.
13. Hatcher RL, Gillaspy JA. Development and validation of a revised short version of the working alliance inventory. *Psychother Res* 2006; **16**: 12–25.
14. Sturgiss E, Douglas K. A collaborative process for developing a weight management toolkit for general practitioners in Australia - an intervention development study using the knowledge to action framework. *Pilot Feasibility Stud* 2016; **2**. DOI: 10.1186/s40814-016-0060-4.
15. Sturgiss E, Douglas K, Kathage R, Res S. A synthesis of selected national Australian guidelines on the management of adult patients who are overweight or obese. *Aust Fam Physician* 2016; **45**: 327–331.
16. van Weel C, Konig-Zahn C, Touw-Otten FWMM, van Duijn NP, Meyboom-de Jong B. *Measuring Functional Status with the COOP/WONCA Charts*. Noordelijke Centrum voor Gezondheidsvraagstukken (NCG)/ Northern Centre of Health Care Research (NCH): Groningen, 2012.
17. Kolotkin R, Crosby R. Psychometric evaluation of the Impact Of Weight On Quality Of Life-Lite Questionnaire (IWQOL-Lite) in a community sample. *Qual Life Res* 2002; **11**: 157–171.
18. Cohen J. A power primer. *Psychol Bull* 1992; **112**: 155–159.
19. Carvajal R, Wadden T, Tsai A, Peck K, Moran C. Managing obesity in primary care practice: a narrative review. *Ann N Y Acad Sci* 2013; **The Year in Diabetes and Obesity**: 191–206.
20. Miller BM, Brennan L. Measuring and reporting attrition from obesity treatment programs: a call to action!. *Obes Res Clin Pract* 2015; **9**: 187–202.
21. Moroshko I, Brennan L, O'Brien P. Predictors of dropout in weight loss interventions: a systematic review of the literature. *Obes Rev* 2011; **12**: 912–934.

Chapter 9

Conclusion and future directions

Summary of the results

This doctoral work was prompted by a question from a patient – "how can you, as my GP, help me manage my weight?" Research began with a scoping review that identified a mismatch in the literature between how GPs are involved in primary care interventions, the role ascribed to them by clinical overviews, and their stated role in international guidelines (Chapter 2a). A narrative review was used to summarise the role of the GP, in particular their expertise in generalism, and match this to the skills needed for weight management (Chapter 2b). A gap was identified in resources available to GPs and their patients for weight management and this prompted the development of The Change Program.

The development of The Change Program was guided by the UK's Medical Research Council (MRC) Guidelines for the development of complex interventions.[1] An initial draft was created after synthesising relevant guidelines for Australian general practice. Then, applying the Knowledge To Action framework, stakeholders were engaged to review and amend the drafted GP handbook and patient workbook (Chapter 4). Finally, The Change Program was used in a feasibility study in five general practices, including one rural practice, and involved 12 GPs and 23 patients (Chapter 5). This initial phase of testing of The Change Program proved that the approach was acceptable to both GPs and patients, and that it was feasible within the general practice setting.

There were a number of factors that were identified as important to the workings of The Change Program. The therapeutic relationship between the patient and their GP was a positive influence, particularly in engaging and retaining patients in the six-month feasibility trial (Chapter 8). There was also a "ripple" effect for both the GPs and patients who participated in the trial. Patients identified changes in people in their close social networks, such as spouses and other family members. General practitioners identified changes in the way they managed other patients with obesity in their daily practice, and acknowledged that their participation in the trial changed their approach to obesity management (Chapter 6).

Notably, we also identified an improvement in the GPs' confidence and self-efficacy in managing obesity (Chapter 6). Relating Bandura's social cognitive theory, the GPs experienced "performance mastery" which refers to the phenomenon of having a positive, personal involvement with a new task.[2] Performance mastery has been identified as the strongest predictor of sustained self-efficacy.[2]

This finding is positive for ongoing research that results in sustained improvements in weight management in general practice.

Following the findings of this doctoral work, modifications to the 5As framework for behaviour change were suggested (Chapter 7). This modified model highlights the centrality of person-centredness to behaviour change work, the need for an encompassing therapeutic alliance, and recognition that this work occurs over time and not within one consultation. This modified model better reflects the complexity of assisting patients with behaviour change and could be applied in both teaching and research settings.

Strengths and limitations of this work

This doctoral work was based on a clinically driven question about a problem faced in everyday general practice. Research questions that are of importance to stakeholders, including clinicians, are more likely to lead to changes that are disseminated and embedded into clinical practice.[3] The involvement of both patients and GPs from the conception of this work is in line with best practice for stakeholder engagement in research practices.

By using concurrent mixed methods as the approach to the feasibility study,[4] we were able to deepen our understanding of how and why The Change Program might be effective. Concurrent mixed methods allow research questions to be asked that are not possible to answer with either quantitative or qualitative data alone.[4] Additionally, we were able to triangulate qualitative and quantitative data using the Normalisation Process Theory alongside the new quantitative NoMAD tool.[5] Mixed method designs in primary care allow for a better understanding of how and why processes might work.

Limitations of the feasibility trial include the small sample of self-selecting GPs. It is possible that they were not representative of the usual GP. Furthermore, it was clear from the NPT data that implementation would have been better if we had recruited whole general practices, rather than individual GPs. This would have allowed for practices to access their usual teamwork practices such as administration procedures and possibly nursing support.

Finally, weight loss is considered to be the marker of success in obesity management trials. When thinking about a future effectiveness trial, weight loss as a primary outcome may need to be reviewed in light of recent literature on the definition of obesity as excessive body fat plus an impairment in health.[6] In a recent analysis paper, I worked with international colleagues to explore the assumptions that we make about obesity when weight loss alone is used as primary outcome

measure.[7] In this analysis paper we suggested that quality of life, metabolic outcomes, and patient experience would provide more holistic measures of outcomes in obesity trials.[7] The specific outcome measures could be informed by literature from patient-centred care. The therapeutic relationship is recognised as an essential component of patient-centred care and outcomes measures have been used to assess the consultation process, patient satisfaction, adherence to treatment, and patient health outcomes.[8]

Key contributions

1. Development of The Change Program

   The doctoral work has resulted in the development of The Change Program that is based on best available evidence for the Australian general practice setting, and was informed by the UK's MRC guideline for the development of complex interventions.[1] A feasibility trial determined that the weight management resource was acceptable to patients and GPs, and that it was feasible to deliver within general practice.[9]

2. Demonstration of improving GP self-efficacy through performance mastery

   Social cognitive theory suggests that programs based solely on the education of GPs are likely to be less successful than those that provide a practical, hands-on approach. Findings from the feasibility study of The Change Program, informed by Bandura's social cognitive theory, suggests approaches are needed that are based on practical application of tasks, rather than simple education or didactic lectures. This doctoral work is further evidence that a more pragmatic approach to practice change is needed, particularly with the provision of resources that can be incorporated in daily practice.[10]

3. Therapeutic alliance measurement in general practice

   The strength of the therapeutic alliance was trending towards association with patient outcomes in the feasibility trial.[11] Typically, therapeutic alliance and similar concepts are only compared to patients' intention to change or patient satisfaction. Demonstrating a possible correlation between therapeutic alliance and patient outcomes is new territory that should be further investigated.

To conclude this doctoral work, there are two further points to discuss:

1. Now that it has been found to be feasible, what is the best trial design to investigate the effectiveness of The Change Program?
2. How can the therapeutic alliance be further investigated for use in general practice research?

What is the best trial design to investigate the effectiveness of The Change Program?

Through the feasibility trial, this doctoral work has shown that is possible for The Change Program to work in general practice. Before wider implementation can be considered, as per the UK MRC's guideline, testing the effectiveness is required.[1] This step needs careful consideration of the context as primary care patients are heterogeneous with multiple health problems,[12] and general practices are variable in staffing and infrastructure resources. Recruitment can also be problematic, with time constraints for clinicians, and reluctance to be part of a control arm, leading to low recruitment and high withdrawal rates from primary care trials.[13] Being aware of the unique features of different trial designs and how these are affected by the context of general practice leads to stronger clinical trials with more robust interpretation of findings.

Commonly in primary care trials, practices and clinicians are recruited first, and then the clinicians are asked to assist with recruitment of patients. In a Dutch study on elderly care in the community, clinicians were highly attracted to the intervention arm rather than the control arm.[14] It is likely clinicians would feel disappointed if they were randomised to a control group and this could make patient recruitment more difficult[14] and this finding has implications for considering trial design in primary care.

To test the effectiveness of The Change Program a trial based on the principles of the randomised controlled trial remains the most widely accepted and convincing method. A number of trial designs have been considered and the following is a summary of the benefits and drawbacks of each.

1. Cluster Randomised Controlled Trial

Cluster randomised controlled trials (RCTs) were developed to test interventions where individual randomisation is not possible.[15] When clinicians are involved in the delivery of an intervention, it is often impossible to have them involved equally in both the control arm and the intervention arm. This is because contamination occurs between the two groups making it impossible to test effectiveness appropriately. Practices are thus randomised to be either a "control practice" or an "intervention practice", rather than individual patients being randomised. And so clustering of practices is used to avoid contamination (Figure 1). It can be challenging to recruit practices and clinicians to this design as mostly people (both clinicians and patients) are reluctant to be randomised to the control setting. Assuring clinicians that they will have access to the intervention after the trial may help overcome this reluctance.

Concealment is the blinding of participants between recruitment and randomisation and this can be challenging in a cluster RCT.[16] If clinicians are aware of which trial arm they are recruiting for, and

they are directly involved in recruitment, this can influence the type of patients that they offer the program to.[17] This can lead to a significant difference in the baseline characteristics of patients making interpretation of results difficult, or impossible. Concealment in a cluster RCT can be achieved by either recruiting all patients before randomisation of the practices to clusters, or removing the recruitment of patients from the clinicians to a central recruitment strategy. The Change Program would be difficult to fit into either of these two options. This is because patients would have to wait for extended periods while all patients across all practices were recruited, or if a central recruitment process was used this could potentially reduce the therapeutic relationship context which was found to be important in the feasibility trial.

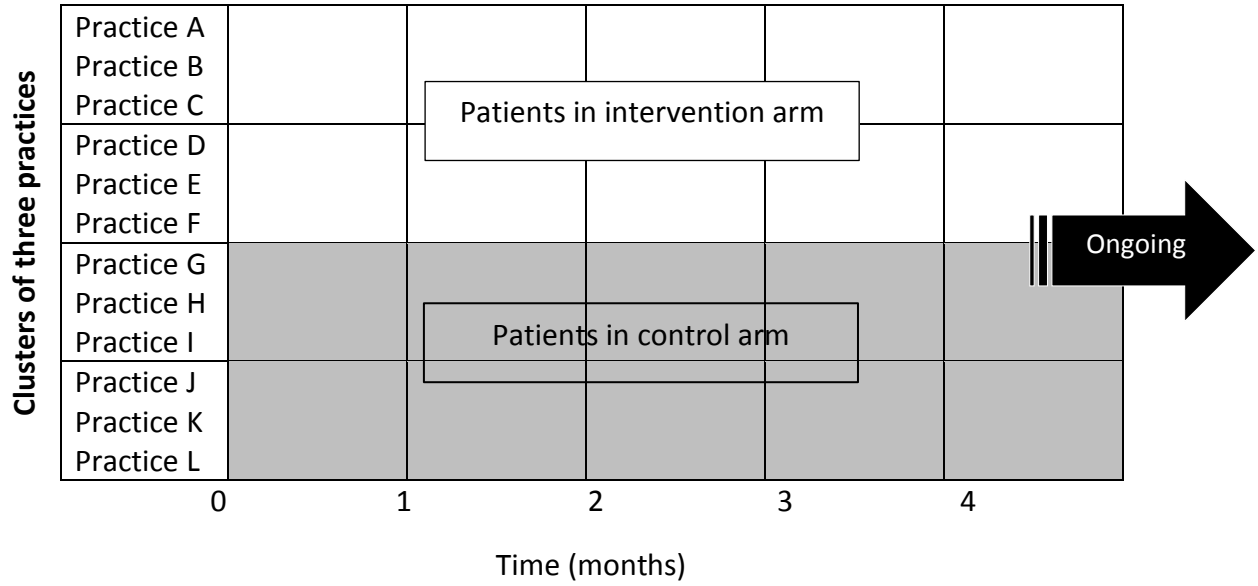

Figure 1 – Design of a cluster randomised controlled trial with three practices in each cluster. Patients are recruited at time zero and remain in either the intervention or control group

2. Cohort Stepped Wedge Randomised Controlled Trial

In a stepped wedge randomised controlled trial (RCT) practices are allocated to clusters which are then randomised to receive the intervention at a specific time point (Figure 2). In the cohort stepped wedge RCT, all patients are recruited at time zero as a "control patient". The patient then switches to the "intervention arm" at the specified time point for the cluster. Similar to a traditional cluster RCT, this design is useful for interventions where providers are involved in the delivery of the intervention making individual patient randomisation impossible.[18] It is also a helpful design for interventions that are going to be implemented widely, but a strong evaluation of the implementation is warranted.

A strength of the cohort stepped wedge design over the cluster RCT (Figure 1) is that all patients will eventually receive the intervention and this may help with recruitment.[18] The sample size required for this trial design is very large, and if there is large variation in the primary outcome measure between patients, an even larger sample size is required. In addition, the time length of each step must be long enough for there to be an expected difference in the primary outcome measure. For example, this would mean a minimum step length of 3 months for The Change Program to see a change in the weight of the participants in the intervention arm.

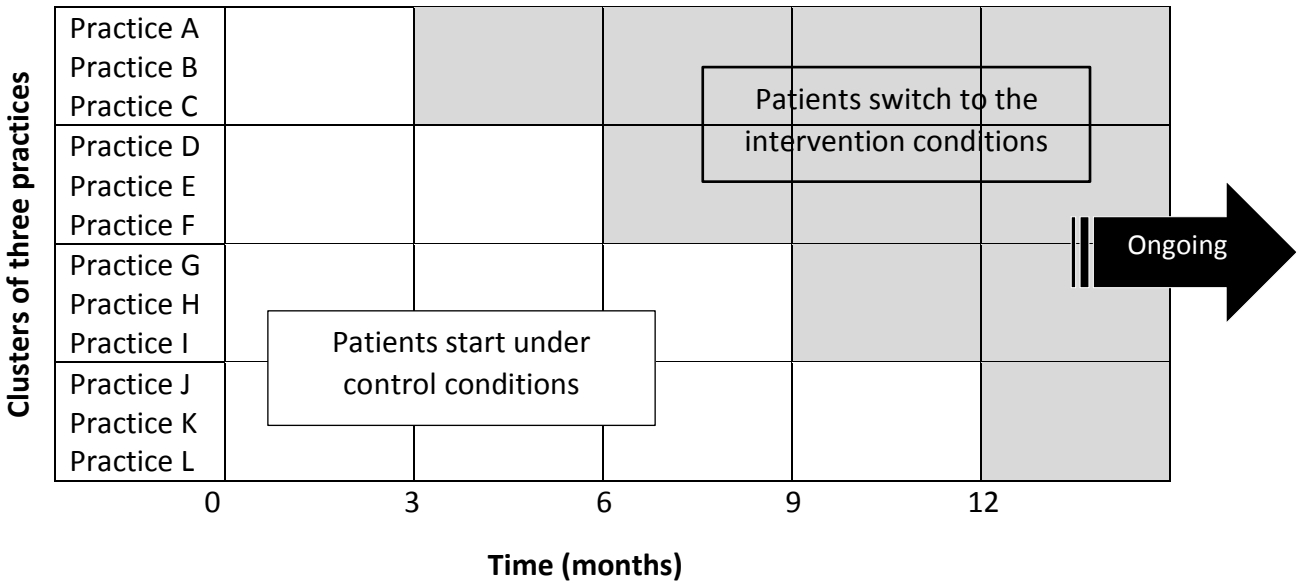

Figure 2 – Design of a cohort stepped wedge randomised controlled trial with three practices in each cluster. Patients are recruited at time zero and change from control to intervention over the study.

3. Stepped Wedge Cluster Randomised Controlled Trial

The stepped wedge cluster RCT is very similar to the cohort stepped wedge cluster RCT (Figure 2), with the main difference being that patients must be recruited at every step of the study (Figure 3). This means that at each step, there are patients in both the control and intervention conditions within each practice. This needs a smaller sample size than the cohort stepped wedge RCT. It has the

problems associated with individual randomisation – there will be contamination between control and intervention patients when the clinicians in each practice are delivering both arms of the trial at the same time.

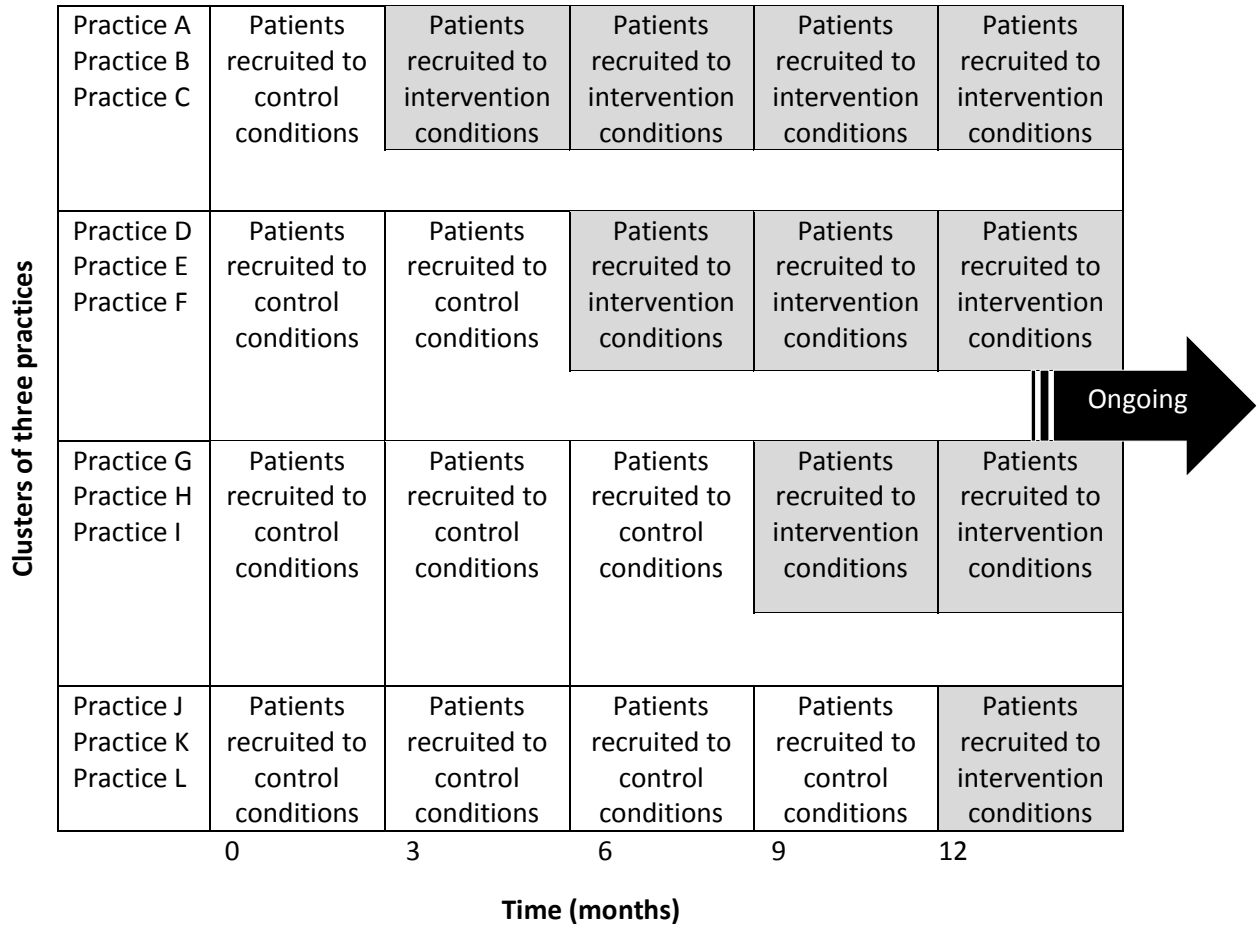

Figure 3 – Design of a stepped wedge randomised controlled trial with three practices in each cluster. Patients recruited in each month of the study to either control or intervention conditions. Over the course of the trial, practices will have patients in both control and intervention conditions.

4. Pseudo-cluster Randomised Controlled Trial

This trial design was developed in the Netherlands to address some of the limitations of the cluster RCT (Figure 1).[19] In this design, general practices are randomised to different ratios of intervention to control conditions. For example, practices are randomised to deliver the intervention condition to 80% of the recruited patients and the control condition to 20% of the recruited patients (80/20) or vice versa (Figure 4). The clinician is not aware of the ratio of intervention to control, and they are not told that it is not 1:1. Clinicians recruit the patient to the trial and then randomisation of the patient is done centrally. This design helps to alleviate the issue with clinicians being reluctant to be

a control practice as all practices will have an opportunity to use the intervention during the trial. It also stops the issue of loss of concealment as randomisation of the patient is done centrally, and the clinicians are not aware of what ratio of control to intervention they have been allocated.[19]

This method can only be used with a complex intervention that has enough parts that can be quarantined to intervention patients only, to minimise contamination. The Change Program probably meets these conditions if the patient workbook is only available to intervention patients. There is some contamination between control and intervention patients in this trial design, but it is minimised compared to the cluster RCT (Figure 1) due to the allocation ratio. It is also possible to take the contamination into account statistically during the analysis.[19]

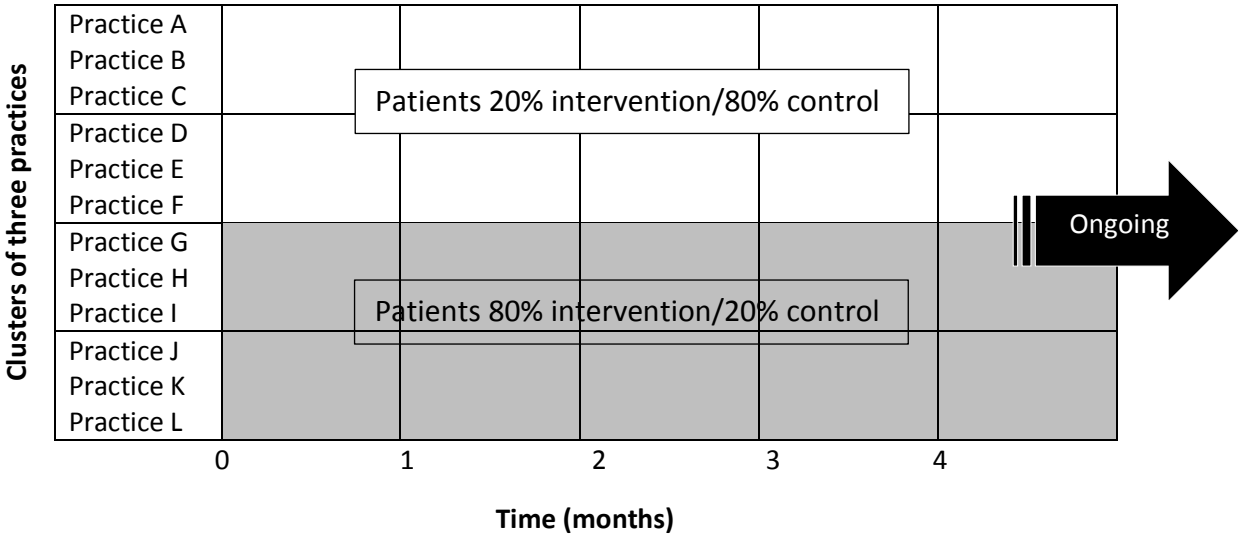

Figure 4 – Design of a pseudo-cluster randomised controlled trial with three practices in each cluster. Patients are recruited at time zero and remain in either control or intervention conditions throughout the trial.

5. Interrupted time series design

An interrupted time series is an observational study design that is most commonly used in public health interventions.[20] All patients within a practice commence in the control condition and many measurements of the primary outcome are taken over a defined time period. The patient is then moved into the intervention condition and further measurements of the primary outcome are taken. This results in a comparison of the outcome measure over time, showing the effect on the outcome measure when the intervention is started and then followed over time.

As it is an observational design, it is more difficult to argue that a causal link exists between an intervention and an outcome. This can be somewhat helped by randomising when each practice starts the intervention with patients. Additionally, even though the patient is held in the control

condition, the clinician knows that the intervention will be applied at some point and this may interfere with the control condition. It is also only possible to compare patients within a practice with this trial design, and not between different practices.

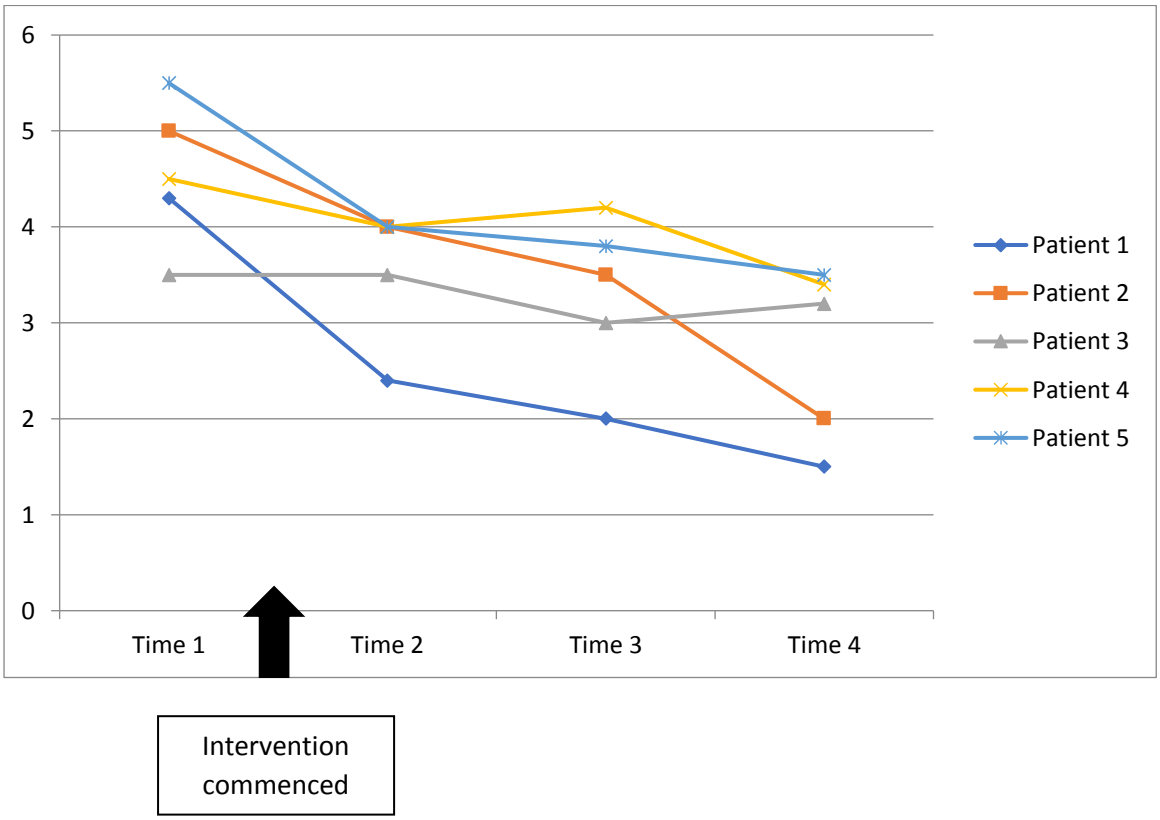

Figure 5 – Design of an interrupted time series. Patients are recruited at time zero and measurements are taken before and after the intervention is implemented in the practice.

In conclusion, there are benefits and drawbacks to each type of clinical trial design in general practice. Considering the above points, the pseudo-cluster RCT (Figure 4) is the most appropriate design for an effectiveness trial of The Change Program.

How can the therapeutic alliance be further investigated for use in general practice research?

A strong therapeutic alliance, as measured by the Working Alliance Inventory (WAI), was related to patient engagement in the feasibility trial (Chapter 8). It is known that many obesity interventions do not translate into the clinical setting due to difficulties with uptake and high participant drop out.[21]

The therapeutic alliance may be a modifiable factor affecting the delivery and effectiveness of obesity interventions.

The findings from this doctoral work have now been extended to adapt the WAI specifically for Australian general practice. A small pilot has been funded through a competitive grant process of the Royal Australian College of General Practitioners for a three phase adaption of the tool. Early engagement with GPs and patients has been positive and the adapted version will be trialled in the clinical setting to assess its concurrent validity with markers of shared decision making and depth of doctor-patient relationship. It is hoped that this theoretically based measure of therapeutic alliance will be aligned with patient outcomes and provide a way to measure and compare the alliance in a research setting. The therapeutic alliance may be a missing link when evaluating the effectiveness of interventions in primary care.

Conclusion

Australian GPs are an under-utilised resource for the management of obesity in primary care. A structured weight management resource can improve GP confidence and self-efficacy in obesity management. Changing the current under-management of obesity in general practice will require more than didactic teaching, educational sessions, and guidelines. The performance mastery experience that was demonstrated in the feasibility trial of The Change Program may be a way to sustained improvement in weight management in general practice. The therapeutic alliance between a patient and their GP was related to patient engagement in the feasibility trial and the alliance is a currently unexamined part of weight management. General practitioners are expert generalists who can provide ongoing, holistic management for obesity. Weight management can be delivered by GPs when they are provided with the appropriate practical resources within a supportive system.

References

1. Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ 2008;337 doi: 10.1136/bmj.a1655.
2. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychological Review 1977;84(2):191-215

3. Jagosh J, Macaulay AC, Pluye P, et al. Uncovering the benefits of participatory research: implications of a realist review for health research and practice. Milbank Q 2012;90(2):311-46 doi: 10.1111/j.1468-0009.2012.00665.x.
4. Creswell JW, Clark VLP. Designing and conducting mixed methods research. 2007
5. Finch TL, Rapley T, Girling M, et al. Improving the normalization of complex interventions: measure development based on normalization process theory (NoMAD): study protocol. Implementation Science 2013;8:43 doi: 10.1186/1748-5908-8-43.
6. Sharma AM, Campbell-Scherer DL. Redefining obesity: beyond the numbers. Obesity 2017;25(4):660-61 doi: 10.1002/oby.21801.
7. Sturgiss E, Jay M, Campbell-Scherer D, et al. Challenging assumptions in obesity research. BMJ 2017;359 doi: 10.1136/bmj.j5303.
8. Dwamena F, Holmes-Rovner M, Gaulden CM, et al. Interventions for providers to promote a patient-centred approach in clinical consultations. The Cochrane database of systematic reviews 2012; 12: Cd003267.
9. Sturgiss EA, Elmitt N, Haesler E, et al. Feasibility and acceptability of a physician-delivered weight management programme. Family Practice 2017;34(1):43-48 doi: 10.1093/fampra/cmw105.
10. Sturgiss E, Haesler E, Elmitt N, et al. Increasing general practitioners' confidence and self-efficacy in managing obesity: a mixed methods study. BMJOpen 2017;7(1):e014314 doi: 10.1136/bmjopen-2016-014314.
11. Sturgiss EA, Sargent GM, Haesler E, et al. Therapeutic alliance and obesity management in primary care - a cross-sectional pilot using the Working Alliance Inventory. Clinical Obesity 2016;6(6):376-79 doi: 10.1111/cob.12167.
12. Boeckxstaens P. Multimorbidity: A quantitative and qualitative exploration in primary care. Ghent University, 2014.
13. Foster JM, Sawyer SM, Smith L, et al. Barriers and facilitators to patient recruitment to a cluster randomized controlled trial in primary care: lessons for future trials. BMC Medical Research Methodology 2015;15:18 doi: 10.1186/s12874-015-0012-3.
14. Melis RJF, Teerenstra S, Rikkert MGMO, et al. Pseudo cluster randomization performed well when used in practice. Journal of Clinical Epidemiology 2008;61(11):1169-75 doi: https://doi.org/10.1016/j.jclinepi.2007.12.001.
15. Eldridge S, Kerry S. Introduction. A Practical Guide to Cluster Randomised Trials in Health Services Research: John Wiley & Sons, Ltd, 2012:1-21.
16. Eldridge S, Kerry S. Recruitment and Ethics. A Practical Guide to Cluster Randomised Trials in Health Services Research: John Wiley & Sons, Ltd, 2012:22-43.
17. Eldridge S, Kerry S. Designing Interventions. A Practical Guide to Cluster Randomised Trials in Health Services Research: John Wiley & Sons, Ltd, 2012:44-59.
18. Hemming K, Haines TP, Chilton PJ, et al. The stepped wedge cluster randomised trial: rationale, design, analysis, and reporting. BMJ 2015;350 doi: 10.1136/bmj.h391.
19. Teerenstra S, Melis RJ, Peer PG, et al. Pseudo cluster randomization dealt with selection bias and contamination in clinical trials. Journal of Clinical Epidemiology 2006;59(4):381-6 doi: 10.1016/j.jclinepi.2005.10.003.
20. Biglan A, Ary D, Wagenaar AC. The value of interrupted time-series experiments for community intervention research. Prevention Science : the official journal of the Society for Prevention Research 2000;1(1):31-49
21. Inelmen EM, Toffanello ED, Enzi G, et al. Predictors of drop-out in overweight and obese outpatients. International Journal Of Obesity 2004;29:122 doi: 10.1038/sj.ijo.0802846.

Bibliography

Agrawal, M., Worzniak, M., & Diamond, L. (2000). Managing obesity like any other chronic condition. Long-term therapy may reduce comorbidity as well. *Postgraduate Medical Journal, 108*(1), 75-82.

Aktürk, Z., Dağdeviren, N., Eneç Can, F., Aydemir, I., & Taştan, K. (2010). An exercise facility connected to family practice offices as a solution for female obesity. *Turkiye Klinikleri Cardiovascular Sciences, 22*(2), 193-199.

Al-Quaiz, A. J. (2001). Current Concepts in the Management of obesity. An evidence based review. *Saudi Med J, 22*(3), 205-210.

Alberga, A. S., Russell-Mayhew, S., Ranson, K., McLaren, L., Ramos-Salas, X., & Sharma, A. M. (2016). Future research in weight bias: what next? *Obesity., 24*. doi: 10.1002/oby.21480

Alberga, A. S., Russell-Mayhew, S., von Ranson, K. M., & McLaren, L. (2016). Weight bias: a call to action. *Journal of Eating Disorders, 4*(1), 34. doi: 10.1186/s40337-016-0112-4

Alberga, A. S., Russell-Mayhew, S., von Ranson, K. M., McLaren, L., Ramos Salas, X., & Sharma, A. M. (2016). Future research in weight bias: What next? *Obesity, 24*(6), 1207-1209. doi: 10.1002/oby.21480

Aldrich, T., & Hackley, B. (2010). The impact of obesity on gynecologic cancer screening: an integrative literature review. *J Midwifery Womens Health, 55*. doi: 10.1016/j.jmwh.2009.10.001

Alexander, S. C., Cox, M. E., Boling Turer, C. L., Lyna, P., Ostbye, T., Tulsky, J. A., . . . Pollak, K. I. (2011). Do the five A's work when physicians counsel about weight loss? *Fam Med, 43*(3), 179-184.

Alexander, S. C., Cox, M. E., Yancy, W. S., Boling Turer, C., Lyna, P., Ostbye, T., . . . Pollak, K. I. (2011). Weight-loss talks: what works (and what doesn't). *J Fam Pract, 60*(4), 213-219.

Alfaris, N., Wadden, T. A., Sarwer, D. B., Diwald, L., Volger, S., Hong, P., . . . Chittams, J. (2015). Effects of a 2-year behavioral weight loss intervention on sleep and mood in obese individuals treated in primary care practice. *Obesity, 23*(3), 558-564.

Allan, G. M., Ivers, N., & Sharma, A. M. (2011). Diets for weight loss and prevention of negative health outcomes. *Canadian Family Physician, 57*(8), 894-895.

Almeida, L., Savoy, S., & Boxer, P. (2011). The role of weight stigmatization in cumulative risk for binge eating. *J Clin Psychol, 67*. doi: 10.1002/jclp.20749

Anderson, D. A., & Wadden, T. A. (1999). Treating the obese patient. Suggestions for primary care practice. *Arch Fam Med, 8*(2), 156-167.

Anderson, P. (2008). Reducing overweight and obesity: closing the gap between primary care and public health. *Fam Pract, 25 Suppl 1*, i10-16. doi: 10.1093/fampra/cmn060

Andreyeva, T., Puhl, R. M., & Brownell, K. D. (2008). Changes in perceived weight discrimination among Americans, 1995–1996 through 2004–2006. *Obesity (Silver Spring), 16*. doi: 10.1038/oby.2008.35

Antognoli, E. L., Smith, K. J., Mason, M. J., Milliner, B. R., Davis, E. M., Harris-Haywood, S., . . . Flocke, S. A. (2014). Direct observation of weight counselling in primary care: alignment with clinical guidelines. *Clin Obes, 4*, 69-76. doi: 10.1111/cob.12050

Appel, L. J., Clark, J. M., Yeh, H.-C., Wang, N.-Y., Coughlin, J. W., Daumit, G., . . . Brancati, F. L. (2011). Comparative effectiveness of weight-loss interventions in clinical practice. *The New England Journal of Medicine, 365*(21), 1959-1968.

Ashley, J. M., St Jeor, S. T., Perumean-Chaney, S., Schrage, J., & Bovee, V. (2001). Meal replacements in weight intervention. *Obes Res, 9 Suppl 4*, 312s-320s. doi: 10.1038/oby.2001.136

Ashley, J. M., St Jeor, S. T., Schrage, J. P., Perumean-Chaney, S. E., Gilbertson, M. C., McCall, N. L., & Bovee, V. (2001). Weight control in the physician's office. *Arch Intern Med, 161*(13), 1599-1604.

Ashman, F., Sturgiss, E., & Haesler, E. (2016). Exploring self-efficacy in Australian general practitioners managing patient obesity: a qualitative survey study. *Int J Family Med, 2016*, 8212837. doi: 10.1155/2016/8212837

Asselin, J., Osunlana, A. M., Ogunleye, A. A., Sharma, A. M., & Campbell-Scherer, D. (2015a). Missing an opportunity: the embedded nature of weight management in primary care. *Clin Obes, 5*(6), 325-332. doi: 10.1111/cob.12115

Australian Bureau of Statistics. (2016). Patient Experiences in Australia: Summary of Findings, 2015-16. Canberra: Australian Bureau of Statistics.

Australian Health Ministers' Advisory Council. (2017). National Strategic Framework for Chronic Conditions. Canberra: Australian Government.

Australian Institute of Health and Welfare. (2017a). National health priority areas. Australia: Australian Government.

Australian Institute of Health and Welfare. (2017b). Weight loss surgery in Australia 2014–15: Australian hospital statistics (Vol. Cat. no. HSE 186). Canberra: Australian Institute of Health and Welfare.

Aveyard, P., Lewis, A., Tearne, S., Hood, K., Christian-Brown, A., Adab, P., . . . Jebb, S. A. (2016). Screening and brief intervention for obesity in primary care: a parallel, two-arm, randomised trial. *Lancet, 388*(10059), 2492-2500. doi: 10.1016/s0140-6736(16)31893-1

Bacon, L., & Aphramor, L. (2011). Weight science: evaluating the evidence for a paradigm shift. *Nutrition Journal, 10*(1), 9. doi: 10.1186/1475-2891-10-9

Baillargeon, J. P., Carpentier, A., Donovan, D., Fortin, M., Grant, A., Simoneau-Roy, J., . . . Langlois, M. F. (2007). Integrated obesity care management system -implementation and research protocol. *BMC Health Serv Res, 7*, 163. doi: 10.1186/1472-6963-7-163

Baillargeon, J. P., St-Cyr-Tribble, D., Xhignesse, M., Grant, A., Brown, C., & Langlois, M. F. (2014). Impact of an integrated obesity management system on patient's care - research protocol. *BMC Obes, 1*, 19. doi: 10.1186/s40608-014-0019-z

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev, 84*(2), 191-215.

Bandura, A. (2001). Social cognitive theory: an agentic perspective. *Annu Rev Psychol, 52*, 1-26. doi: 10.1146/annurev.psych.52.1.1

Banerjee, E. S., Gambler, A., & Fogleman, C. (2013). Adding obesity to the problem list increases the rate of providers addressing obesity. *Fam Med, 45*(9), 629-633.

Barnes, E. R., Theeke, L. A., & Mallow, J. (2015). Impact of the provider and healthcare team Adherence to Treatment Guidelines (PHAT-G) intervention on adherence to national obesity clinical practice guidelines in a primary care centre. *Journal of Evaluation in Clinical Practice, 21*(2), 300-306.

Barnett, K., Mercer, S. W., Norbury, M., Watt, G., Wyke, S., & Guthrie, B. (2012). Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *The Lancet, 380*(9836), 37-43.

Barte, J. C., ter Bogt, N. C., Beltman, F. W., van der Meer, K., & Bemelmans, W. J. (2012). Process evaluation of a lifestyle intervention in primary care: implementation issues and the participants' satisfaction of the GOAL study. *Health Educ Behav, 39*(5), 564-573. doi: 10.1177/1090198111422936

Bartlett, S. (2003). Motivating patients toward weight loss: practical strategies for addressing overweight and obesity. *The Physician and Sportsmedicine, 31*(11), 29-36.

Barwais, F. A., Cuddihy, T. F., & Tomson, L. M. (2013). Physical activity, sedentary behavior and total wellness changes among sedentary adults: a 4-week randomized controlled trial. *Health Qual Life Outcomes, 11*, 183. doi: 10.1186/1477-7525-11-183

Benjamin, R. M., Yanovski, S. Z., & Simons-Morton, D. G. (2013). Can primary care physician-driven community programs address the obesity epidemic among high-risk populations? *JAMA Intern Med, 173*(19), 1778-1779.

Bennett, G. G., Foley, P., Levine, E., Whiteley, J., Askew, S., Steinberg, D. M., . . . Puleo, E. (2013). Behavioral treatment for weight gain prevention among black women in primary carepPractice: a randomized clinical trial. *JAMA internal medicine, 173*(19), 1770-1777. doi: 10.1001/jamainternmed.2013.9263

Bennett, G. G., Warner, E. T., Glasgow, R. E., Askew, S., Goldman, J., Ritzwoller, D. P., . . . Colditz, G. A. (2012). Obesity treatment for socioeconomically disadvantaged patients in primary care practice. *Arch Intern Med, 172*(7), 565-574.

Bennett, W. L., Gudzune, K. A., Appel, L. J., & Clark, J. M. (2014). Insights from the POWER practice-based weight loss trial: a focus group study on the PCP's role in weight management. *Journal of General Internal Medicine, 29*(1), 50-58.

Bennett, W. L., Wang, N.-Y., Gudzune, K. A., Dalcin, A. T., Bleich, S. N., Appel, L. J., & Clark, J. M. (2015). Satisfaction with primary care provider involvement is associated with greater weight loss: Results from the practice-based power trial. *Patient Educ Couns*, 98(9):1099-105.

Bennett, W. L., Wang, N. Y., Gudzune, K. A., Dalcin, A. T., Bleich, S. N., Appel, L. J., & Clark, J. M. (2015). Satisfaction with primary care provider involvement is associated with greater weight loss: Results from the practice-based POWER trial. *Patient Educ Couns, 98*(9), 1099-1105. doi: 10.1016/j.pec.2015.05.006

Benotti, P. (2014). *Patient Preparation for Bariatric Surgery*. USA: Springer.

Bertozzi, N., Bakken, E., Bolognesi, M., Castoldi, F., Massarini, M., Galvani, C., . . . Vitali, P. (2004). Promoting physical activity in overweight and obese patients: counseling in primary care from Italy (Cesena, 2002–2003). *Sport Sciences for Health, 1*(1), 25-30.

Biglan, A., Ary, D., & Wagenaar, A. C. (2000). The value of interrupted time-series experiments for community intervention research. *Prev Sci, 1*(1), 31-49.

Binnie, G. A. (1977). Ten-year follow-up of obesity. *J R Coll Gen Pract, 27*(181), 492-495.

Binsbergen, J. V., Langens, F., Dapper, A., Halteren, M. V., Glijsteen, R., Cleyndert, G., . . . Avendonk, M. V. (2010). *Obesity*. https://guidelines.nhg.org/product/obesity.

Birmingham, C. L., Jones, P., & Hoffer, L. J. (2003). The management of adult obesity. *Eating and Weight Disorders, 8*, 157-163.

Bland, J. M., & Kerry, S. M. (1997). Trials randomised in clusters. *BMJ, 315*(7108), 600. doi: 10.1136/bmj.315.7108.600

Blonstein, A. C., Yank, V., Stafford, R. S., Wilson, S. R., Rosas, L. G., & Ma, J. (2013). Translating an evidence-based lifestyle intervention program into primary care: Lessons learned. *Health Promotion Practice, 14*(4), 491-497.

Blumenthal, J. A., Babyak, M. A., Hinderliter, A., Watkins, L. L., Craighead, L., Lin, P.-H., . . . Sherwood, A. (2010). Effects of the DASH diet alone and in combination with exercise and weight loss on blood pressure and cardiovascular biomarkers in men and women with high blood pressure: The ENCORE Study. *Archives of internal medicine, 170*(2), 126-135. doi: 10.1001/archinternmed.2009.470

Bodenlos, J. S. (2007). Impact of a stage-matched weight loss intervention on stage of change progression in predominantly African-American female primary care patients. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 67*(12-B), 7364.

Boeckxstaens, P. (2014). *Multimorbidity: A quantitative and qualitative exploration in primary care.* (Doctor in Medical Sciences), Ghent University, Ghent, Belgium.

Bolognesi, M., Nigg, C. R., Massarini, M., & Lippke, S. (2006). Reducing obesity indicators through brief physical activity counseling (PACE) in Italian primary care settings. *Annals of Behavioral Medicine, 31*(2), 179-185.

Booth, A. O., Nowson, C. A., Huang, N., Lombard, C., & Singleton, K. L. (2006). Evaluation of a brief pilot nutrition and exercise intervention for the prevention of weight gain in general practice patients. *Public Health Nutrition, 9*(8), 1055-1061.

Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory, Research & Practice, 16*(3), 252-260. doi: 10.1037/h0085885

Bordowitz, R., Morland, K., & Reich, D. (2007). The use of an electronic medical record to improve documentation and treatment of obesity. *Fam Med, 39*(4), 274-279.

Bouchard, C., Tremblay, A., Despres, J. P., Nadeau, A., Lupien, P. J., & Theriault, G. (1990). The response to long-term overfeeding in identical twins. *N Engl J Med, 322*.

Bourn, J. (2001). *Tackling Obesity in England*. London: National Audit Office.

Bowerman, S., Bellman, M., Saltsman, P., Garvey, D., Pimstone, K., Skootsky, S., . . . Heber, D. (2001). Implementation of a primary care physician network obesity management program. *Obesity Research, 9 Suppl 4*, 321S-325S.

Bramlage, P., Wittchen, H. U., Pittrow, D., Kirch, W., Krause, P., Lehnert, H., . . . Sharma, A. M. (2004). Recognition and management of overweight and obesity in primary care in Germany. *Int J Obes Relat Metab Disord, 28*(10), 1299-1308. doi: 10.1038/sj.ijo.0802752

Brauer, P., Connor Gorber, S., Shaw, E., Singh, H., Bell, N., Shane, A. R., . . . Tonelli, M. (2015). Recommendations for prevention of weight gain and use of behavioural and pharmacologic interventions to manage overweight and obesity in adults in primary care. *CMAJ, 187*(3), 184-195. doi: 10.1503/cmaj.140887

Brewis, A. A. (2014). Stigma and the perpetuation of obesity. *Social Science & Medicine, 118*(Supplement C), 152-158. doi: https://doi.org/10.1016/j.socscimed.2014.08.003

Britt, H., Miller, G., Henderson, J., Bayram, C., Harrison, C., Valenti, L., . . . Gordon, J. (2016). *General practice activity in Australia 2015-16* (Vol. General practice series no. 40). Sydney: Sydney University Press.

Brouwers, M. C., Kho, M. E., Browman, G. P., Burgers, J. S., Cluzeau, F., Feder, G., . . . Zitzelsberger, L. (2010). AGREE II: advancing guideline development, reporting and evaluation in health care. *CMAJ : Canadian Medical Association Journal, 182*(18), E839-E842. doi: 10.1503/cmaj.090449

Brouwers M, Rasenberg E, van Weel C, Laan R, van Weel-Baumgarten E. Assessing patient-centred communication in teaching: a systematic review of instruments. Medical education 2017; 51(11): 1103-17.

Brown, W., Korin, A., Burton, P., & O'Brien, P. E. (2009). Laparoscopic adjustable gastric banding. *Aust Fam Physician, 38*(12), 972-976.

Brunton, S. A., Skolnik, N. S., Ryan, D. H., Kushner, R. F., Sur, D. K., & Aronne, L. J. (2014). Management of obesity in adults. *The Journal of Family Practice, 63*(7), S1-S33.

Buclin-Thiebaud, S., Pataky, Z., Bruchez, V., & Golay, A. (2010). New psycho-pedagogic approach to obesity treatment: a 5-year follow-up. *Patient Educ Couns, 79*(3), 333-337.

Campbell-Scherer, D. L., Asselin, J., Osunlana, A. M., Fielding, S., Anderson, R., Rueda-Clausen, C. F., . . . Sharma, A. M. (2014). Implementation and evaluation of the 5As framework of obesity management in primary care: design of the 5As Team (5AsT) randomized control trial. *Implementation Science, 9*(1), 78. doi: 10.1186/1748-5908-9-78

Cao, T. T. (2014). *A new model of weight loss clinic in general practice using multidisciplinary approach in group sessions*. Paper presented at the GP14, Adelaide.

Carvajal, R., Wadden, T. A., Tsai, A. G., Peck, K., & Moran, C. H. (2013). Managing obesity in primary care practice: a narrative review. *Ann N Y Acad Sci, 1281*, 191-206. doi: 10.1111/nyas.12004

Caulfield, T. (2007). Obesity, legal duties, and the family physician. *Can Fam Physician, 53*, 1129-1130.

Cerveny, R. (2007). Approaching the obese patients in primary health care in the Czech Republic. *Bratislavské lekárske listy, 108*(9), 425-427.

Chan, J. M., Rimm, E. B., Colditz, G. A., Stampfer, M. J., & Willett, W. C. (1994). Obesity, fat distribution, and weight gain as risk factors for clinical diabetes in men. *Diabetes Care, 17*(9), 961-969.

Choban, P. S., Jackson, B., Poplawski, S., & Bistolarides, P. (2002). Bariatric surgery for morbid obesity: why, who, when, how, where, and then what? *Cleve Clin J Med, 69*(11), 897-903.

Ciao, A. C., Loth, K., & Neumark-Sztainer, D. (2014). Preventing eating disorder pathology: common and unique features of successful eating disorders prevention programs. *Curr Psychiatry Rep, 16*. doi: 10.1007/s11920-014-0453-0

Claridge R, Gray L, Stubbe M, Macdonald L, Tester R, Dowell AC. General practitioner opinion of weight management interventions in New Zealand. Journal of primary health care 2014; 6(3): 212-20.

Clark, A. M. (2013). What are the components of complex interventions in healthcare? Theorizing approaches to parts, powers and the whole intervention. *Social Science & Medicine, 93*(Supplement C), 185-193.

Clark, A. M., & Thompson, D. R. (2008). The future of management programmes for heart failure. *Lancet, 372*(9641), 784-786. doi: 10.1016/s0140-6736(08)61317-3

Clark, D., Chrysler, L., Perkins, A., Keith, N. R., Willis, D. R., Abernathy, G., & Smith, F. (2010). Screening, referral, and participation in a weight management program implemented in five CHCs. *Journal of Health Care for the Poor and Underserved, 21*(2), 617-628.

Clark, D. O., Keith, N., Chrysler, L., Perkins, A. J., & Willis, D. (2008). Design and reach of a primary care weight management program. *Journal of Health Care for the Poor and Underserved, 19*(1), 171-179.

Cohen, R., Pinheiro, J. S., Correa, J. L., & Schiavon, C. A. (2006). Laparoscopic Roux-en-Y gastric bypass for BMI < 35 kg/m(2): a tailored approach. *Surg Obes Relat Dis, 2*(3), 401-404, discussion 404. doi: 10.1016/j.soard.2006.02.011

Colditz, G. A., Willett, W. C., Rotnitzky, A., & Manson, J. E. (1995). Weight gain as a risk factor for clinical diabetes mellitus in women. *Ann Intern Med, 122*(7), 481-486.

Committee., G. a. P. A. (2011). *Overweight and Obese Adults: Diagnosis and Management*. British Columbia: British Columbia Medical Association.

Coupar, A. M., & Kennedy, T. (1980). Running a weight control group: experiences of a psychologist and a general practitioner. *Journal of the Royal College of General Practitioners, 30*(210), 41-48.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2006). Developing and evaluating complex interventions: new guidance. UK: UK Medical Research Council.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ, 337*. doi: 10.1136/bmj.a1655

Crandall, R., & Reser, A. (2005). Attributions and weight-based prejudice. In K. Brownell, R. Puhl, M. Schwartz & L. Rudd (Eds.), *Weight bias: nature, consequences and remedies*. New York: Guildford Press.

Crawford-Faucher, A. (2012). Which weight-loss programs are most effective? *American Family Physician, 86*(3), 280-282.

Creswell, J. W., & Clark, V. L. P. (2007). Designing and conducting mixed methods research.

Cutler, L., King, B., McCarthy, N., Hamilton, G., & Cook, L. (2010). Appetite for life: An evaluation of a primary care lifestyle programme. *Journal of Primary Health Care, 2*(4), 281-287.

Danielsdottir, S., O'Brien, K. S., & Ciao, A. (2010). Anti-fat prejudice reduction: a review of published studies. *Obes Facts, 3*. doi: 10.1159/000277067

Davis Martin, P., Rhode, P. C., Dutton, G. R., Redmann, S. M., Ryan, D. H., & Brantley, P. J. (2006). A primary care weight management intervention for low-income African-American women. *Obesity (Silver Spring), 14*(8), 1412-1420. doi: 10.1038/oby.2006.160

DeMaria , E. J. (2007). Bariatric surgery for morbid obesity. *New England Journal of Medicine, 356*(21), 2176-2183. doi: doi:10.1056/NEJMct067019

Derbas, J., Vetter, M., Volger, S., Khan, Z., Panigrahi, E., & Tsai, A. (2009). Improving weight management in primary care practice: a possible role for auxiliary health professionals collaborating with primary care physicians. *Obesity and Weight Management, 5*, 210-215.

Dixon, J. B. (2009). Referral for a bariatric surgical consultation: it is time to set a standard of care. *Obes Surg, 19*(5), 641-644. doi: 10.1007/s11695-008-9765-7

Dixon JB, Hayden MJ, O'Brien PE, Piterman L. Physician Attitudes, Beliefs and Barriers towards the Management and Treatment of Adult Obesity: A Literature Review. Australian Journal of Primary Health 2008; 14(3): 9-18.

Doering, T., Harwell, S., Fassler, C., Burr, K., Hewitt, S., & Trabue, C. (2013). An interventional pilot study on obesity among low-income patients using a computer-based weight management module. *J Community Hosp Intern Med Perspect, 3*(1).

Driehuis, F., Barte, J. C., Ter Bogt, N. C., Beltman, F. W., Smit, A. J., van der Meer, K., & Bemelmans, W. J. (2012). Maintenance of lifestyle changes: 3-year results of the Groningen Overweight and Lifestyle study. *Patient Educ Couns, 88*(2), 249-255.

Duckett, S., Swerissen, H., & Moran, G. (2017). Building better foundations for primary care. Sydney: Grattan Institute.

Durso, L. E., Latner, J. D., & Hayashi, K. (2012). Perceived discrimination is associated with binge eating in a community sample of non-overweight, overweight, and obese adults. *Obes Facts, 5*. doi: 10.1159/000345931

Dutton, G. R., Phillips, J. M., Kukkamalla, M., Cherrington, A. L., & Safford, M. M. (2015). Pilot study evaluating the feasibility and initial outcomes of a primary care weight loss intervention with peer coaches. *The Diabetes Educator, 41*(3), 361-368.

Dwamena F, Holmes-Rovner M, Gaulden CM, et al. Interventions for providers to promote a patient-centred approach in clinical consultations. The Cochrane database of systematic reviews 2012; 12: Cd003267.

Echenique Sarah, J., Rodríguez Osiac, L., Pizarro Quevedo, T., Martín A, M., & Atalah Samur, E. (2011). Impact of a national treatment program in overweight adults women in primary care centers. *Nutricion Hospitalaria, 26*(6), 1372-1377. doi: 10.3305/nh.2011.26.6.5272

Eichler, K., Zoller, M., Steurer, J., & Bachmann, L. M. (2007). Cognitive-behavioural treatment for weight loss in primary care: A prospective study. *Swiss Med Wkly, 137*(35-36), 489-495.

Eldridge, S., & Kerry, S. (2012). Designing Interventions *A Practical Guide to Cluster Randomised Trials in Health Services Research* (pp. 44-59): John Wiley & Sons, Ltd.

Elvins R, Green J. The conceptualization and measurement of therapeutic alliance: An empirical review. Clinical Psychology Review 2008; 28(7): 1167-87.

Ely, A. C., Banitt, A., Befort, C., Hou, Q., Rhode, P. C., Grund, C., . . . Ellerbeck, E. (2008). Kansas primary care weighs in: A pilot randomized trial of a chronic care model program for obesity in 3 rural Kansas primary care practices. *The Journal of Rural Health, 24*(2), 125-132.

Feigenbaum, A., Pasternak, S., Zusk, E., Sarid, M., & Vinker, S. (2005). Influence of intense multidisciplinary follow-up and orlistat on weight reduction in a primary care setting. *BMC Family Practice, 6*. doi: 10.1186/1471-2296-6-5

Feuerstein, J. S., Takayasu, K., Maltz, A., Bjerke, W. S., Hu, H., Nixon, I., & McQuiston, C. (2015). Teaching a lifestyle intervention for reversing impaired fasting glucose, hyperlipidemia and obesity/overweight to a cohort of local physicians. *Current Nutrition and Food Science, 11*(1), 65-69.

Field, B., Booth, A., Ilott, I., & Gerrish, K. (2014). Using the Knowledge to Action Framework in practice: a citation analysis and systematic review. *Implementation Science, 9*(1), 172. doi: 10.1186/s13012-014-0172-2

Fildes, A., Charlton, J., Rudisill, C., Littlejohns, P., Prevost, A. T., & Gulliford, M. C. (2015). Probability of an obese person attaining normal body weight: cohort study using electronic health records. *Am J Public Health, 105*(9), e54-59.

Finch, T. L., Rapley, T., Girling, M., Mair, F. S., Murray, E., Treweek, S., . . . May, C. R. (2013). Improving the normalization of complex interventions: measure development based on normalization process theory (NoMAD): study protocol. *Implement Sci, 8*, 43.

Fitzpatrick, S. L., Wischenka, D., Appelhans, B. M., Pbert, L., Wang, M., Wilson, D. K., . . . Society of Behavioral, M. (2016). An evidence-based guide for obesity treatment in primary care. *Am J Med, 129*(1), 115 e111-117. doi: 10.1016/j.amjmed.2015.07.015

Flegal, K. M., Kit, B. K., Orpana, H., & Graubard, B. I. (2013). Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. *JAMA, 309*. doi: 10.1001/jama.2012.113905

Flodgren, G., Deane, K., Dickinson, H. O., Kirk, S., Alberti, H., Beyer, F. R., . . . Eccles, M. P. (2010). Interventions to change the behaviour of health professionals and the organisation of care to promote weight reduction in overweight and obese people. *Cochrane Database Syst Rev*(3), Cd000984. doi: 10.1002/14651858.CD000984.pub2

Fobi, M., Lee, H., Igwe, D., Felahy, B., James, E., Stanczyk, M., & Fobi, N. (2002). Gastric bypass in patients with BMI < 40 but > 32 without life-threatening co-morbidities: preliminary report. *Obes Surg, 12*(1), 52-56. doi: 10.1381/096089202321144586

Forhan, M., Risdon, C., & Solomon, P. (2013). Contributors to patient engagement in primary health care: perceptions of patients with obesity. *Prim Health Care Res Dev, 14*. doi: 10.1017/s1463423612000643

Forhan, M., & Salas, X. R. (2013). Inequities in healthcare: a review of bias and discrimination in obesity treatment. *Can J Diabetes, 37*(3), 205-209. doi: 10.1016/j.jcjd.2013.03.362

Forjuoh, S. N., Ory, M. G., Wang, S., des Bordes, J. K., & Hong, Y. (2014). Using the iPod Touch for Patient Health Behavior Assessment and Health Promotion in Primary Care. *JMIR Mhealth Uhealth, 2*(1), e14. doi: 10.2196/mhealth.2927

Foster, J. M., Sawyer, S. M., Smith, L., Reddel, H. K., & Usherwood, T. (2015). Barriers and facilitators to patient recruitment to a cluster randomized controlled trial in primary care: lessons for future trials. *BMC Medical Research Methodology, 15*, 18.

Foster, M. M., Cornwell, P. L., Fleming, J. M., Mitchell, G. K., Tweedy, S. M., Hart, A. L., & Haines, T. P. (2009). Better than nothing? Restrictions and realities of enhanced primary care for allied health practitioners. *Australian Journal of Primary Health, 15*(4), 326-334. doi: https://doi.org/10.1071/PY08065

Fothergill, E., Guo, J., Howard, L., Kerns, J. C., Knuth, N. D., Brychta, R., . . . Hall, K. D. (2016). Persistent metabolic adaptation 6 years after “The Biggest Loser” competition. *Obesity, 24*(8), 1612-1619. doi: 10.1002/oby.21538

Frank, A. (1998). A multidisciplinary approach to obesity management: The physician's role and team care alternatives. *American Dietetic Association, 98*(10 supp 2), S44-48.

Fransen, G. A., Hiddink, G. J., Koelen, M. A., van Dis, S. J., Drenthen, A. J., van Binsbergen, J. J., & van Woerkum, C. M. (2008). The development of a minimal intervention strategy to address overweight and obesity in adult primary care patients in The Netherlands. *Fam Pract, 25 Suppl 1*, i112-115. doi: 10.1093/fampra/cmn083

Friedman, K. E., Reichmann, S. K., Costanzo, P. R., Zelli, A., Ashmore, J. A., & Musante, G. J. (2005). Weight stigmatization and ideological beliefs: relation to psychological functioning in obese adults. *Obes Res, 13*. doi: 10.1038/oby.2005.105

Frood, S., Johnston, L. M., Matteson, C. L., & Finegood, D. T. (2013). Obesity, complexity, and the role of the health system. *Curr Obes Rep, 2*. doi: 10.1007/s13679-013-0072-9

Fuller, N. R., Colagiuri, S., Schofield, D., Olson, A. D., Shrestha, R., Holzapfel, C., . . . Caterson, I. D. (2013). A within-trial cost-effectiveness analysis of primary care referral to a commercial provider for weight loss treatment, relative to standard care-an international randomised controlled trial. *International Journal Of Obesity, 37*(6), 828-834. doi: 10.1038/ijo.2012.139

Gaglioti, A., Petterson, S. M., Bazemore, A. W., Phillips, R. L., Dodoo, M. S., & Zhang, X. (2009). Primary Care’s Ecologic Impact on Obesity. *Am Fam Physician, 79*(6), 446.

Gaglioti, A. H., Petterson, S., Bazemore, A., & Phillips, R. (2016). Access to Primary Care in US Counties Is Associated with Lower Obesity Rates. *J Am Board Fam Med, 29*(2), 182-190. doi: 10.3122/jabfm.2016.02.150356

Gandjour, A. (2001). Development process of an evidence-based guideline for the treatment of obesity. *International Journal for Quality in Health Care, 13*(4), 325-332. doi: 10.1093/intqhc/13.4.325

Garies, S., Irving, A., Williamson, T., & Drummond, N. (2015). Using EMR data to evaluate a physician-developed lifestyle plan for obese patients in primary care. *Canadian Family Physician, 61*(5), e225-e231.

Gibbs, H. D., McQuigg, M., Broom, J., Brown, J., Laws, R., Reckless, J. P. D., . . . Montazeri, A. (2004). A new evidence-based model for weight management in primary care: The counterweight programme. *Journal of Human Nutrition and Dietetics, 17*(3), 191-208. doi: 10.1111/j.1365-277X.2004.00517.x

Goodyear-Smith, F., McPhee, J., Duncan, S., & Schofield, G. (2014). Evaluation of a primary care-based programme designed to increase exercise and improve nutrition in patients at risk. *J Prim Health Care, 6*(4), 312-318.

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: time for a map? *J Contin Educ Health Prof, 26*(1), 13-24. doi: 10.1002/chp.47

Gray, J., & Hoon, E. (2015). *Experiencing obesity, seeking support in general practice*. Paper presented at the 9th Health Services and Policy Research Conference, Melbourne.

Greaney, M. L., Quintiliani, L. M., Warner, E. T., King, D. K., Emmons, K. M., Colditz, G. A., . . . Bennett, G. G. (2009). Weight management among patients at community health centers: The "Be Fit, Be Well" study. *Obesity and Weight Management, 5*(5), 222-228.

Grief, S. (2010). Strategies to facilitate weight loss in patients who are obese. *Am Fam Physician, 82*(12), 1434.

Grima, M., & Dixon, J. (2013). Obesity: Recommendations for management in general practice and beyond. *Aust Fam Physician, 42*(8), 532-541.

Gstettner, A., Holzapfel, C., Stoll, J., & Hauner, H. (2013). Weight reduction: Evaluation of the possibilities in primary care and patient satisfaction: Results from a weight reduction trial. *Deutsche Medizinische Wochenschrift, 138*(19), 989-994.

Gusi, N., Reyes, M. C., Gonzalez-Guerrero, J. L., Herrera, E., & Garcia, J. M. (2008). Cost-utility of a walking programme for moderately depressed, obese, or overweight elderly women in primary care: A randomised controlled trial. *BMC Public Health, 8*.

Haas, W. C., Moore, J. B., Kaplan, M., & Lazorick, S. (2012). Outcomes from a medical weight loss program: Primary care clinics versus weight loss clinics. *American Journal of Medicine, 125*(6), 603.e607-603.e611. doi: 10.1016/j.amjmed.2011.07.039

Hagaman, M. (2010). FP's patients are successful "losers". *The Journal of Family Practice, 59*(9), 488.

Hainer, V. (1999). How should the obese patient be managed? Possible approaches to a national obesity management network. *Int J Obes Relat Metab Disord, 23 Suppl 4*, S14-18; discussion S18-19.

Haines, J., & Neumark-Sztainer, D. (2006). Prevention of obesity and eating disorders: a consideration of shared risk factors. *Health Educ Res, 21*. doi: 10.1093/her/cyl094

Harris, M. F., & Zwar, N. A. (2007). Care of patients with chronic disease: the challenge for general practice. *Med J Aust, 187*(2), 104-107.

Harris, M. F., & Zwar, N. A. (2014). Reflections on the history of general practice in Australia. *Med J Aust, 201*(1 Suppl), S37-40.

Hartman, S. J., Risica, P. M., Gans, K. M., Marcus, B. H., & Eaton, C. B. (2014). Tailored weight loss intervention in obese adults within primary care practice: Rationale, design, and methods of Choose to Lose. *Contemporary Clinical Trials, 38*(2), 409-419.

Hartmann-Boyce, J., Johns, D. J., Jebb, S. A., Summerbell, C., & Aveyard, P. (2014). Behavioural weight management programmes for adults assessed by trials conducted in everyday contexts: systematic review and meta-analysis. *Obes Rev, 15*(11), 920-932.

Hatzenbuehler, M. L., Phelan, J. C., & Link, B. G. (2013). Stigma as a fundamental cause of population health inequalities. *Am J Public Health, 103*.

Hauner, H., Meier, M., Wendland, G., Kurscheid, T., & Lauterbach, K. (2004). Weight reduction by sibutramine in obese subjects in primary care medicine: The S.A.T. study. *Experimental and Clinical Endocrinology and Diabetes, 112*(4), 201-207.

Heber, D., Greenway, F. L., Kaplan, L. M., Livingston, E., Salvador, J., & Still, C. (2010). Endocrine and nutritional management of the post-bariatric surgery patient: an Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab, 95*(11), 4823-4843.

Hemming, K., Haines, T. P., Chilton, P. J., Girling, A. J., & Lilford, R. J. (2015). The stepped wedge cluster randomised trial: rationale, design, analysis, and reporting. *BMJ : British Medical Journal, 350*. doi: 10.1136/bmj.h391

Heraief, E. (1997). [Tolerance and acceptability of dexfenfluramine in the long-term treatment of obesity in private practice. ESIM Group]. *Rev Med Suisse Romande, 117*(1), 19-24.

Hill, J. (1998). Dealing With Obesity as a Chronic Disease. *Obesity Research, 6*(supp 1), 34S - 38S.

Hill, J. O., & Wyatt, H. (2002). Outpatient Management of Obesity: A Primary Care Perspective. *Obesity Research, 10*(supp 2), 124S-130S.

Hillman, C. H., Erickson, K. I., & Kramer, A. F. (2008). Be smart, exercise your heart: exercise effects on brain and cognition. *Nat Rev Neurosci, 9*(1), 58-65.

Hoddinott, P. (2015). A new era for intervention development studies. *Pilot and Feasibility Studies, 1*(1), 36. doi: 10.1186/s40814-015-0032-0

Hoke, C. N., & Franks, S. (2002). Work site, physician's office, or medical university clinic: The effect of setting on success in a multidisciplinary weight-loss program. *Eating Behaviors, 3*(1), 93-100. doi: 10.1016/S1471-0153(01)00053-8

Holzapfel, C., Cresswell, L., Ahern, A. L., Fuller, N. R., Eberhard, M., Stoll, J., . . . Hauner, H. (2014). The challenge of a 2-year follow-up after intervention for weight loss in primary care. *Int J Obes (Lond), 38*(6), 806-811. doi: 10.1038/ijo.2013.180

Hooft van Huysduynen EJC, Hiddink GJ, van Woerkum CJM. The use of theory in research on nutrition guidance practices by primary care physicians from 1995 to October 2008: a review. Family practice 2012; 29(suppl_1): i56-i60.

Horvath, A. O., & Greenberg, L. S. (1994). *The Working Alliance: Theory, Research, and Practice*: Wiley.

Hoyt, A. (2013). Person, place, and prevention in primary care: A multilevel analysis of variation in the delivery of mental health, substance-use disorder, and obesity services. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 73*(9-A(E)).

Huber, C. A., Mohler-Kuo, M., Zellweger, U., Zoller, M., Rosemann, T., & Senn, O. (2011). Obesity management and continuing medical education in primary care: results of a Swiss survey. *BMC Fam Pract, 12*, 140. doi: 10.1186/1471-2296-12-140

Huerta, S., Li, Z., Li, H. C., Hu, M. S., Yu, C. A., & Heber, D. (2004). Feasibility of a partial meal replacement plan for weight loss in low-income patients. *International Journal Of Obesity, 28*(12), 1575-1579. doi: 10.1038/sj.ijo.0802792

Iacobucci, G. (2014). Pay GPs to tackle obesity, doctors urge UK government. *BMJ, 348*, g232. doi: 10.1136/bmj.g232

Inelmen, E. M., Toffanello, E. D., Enzi, G., Gasparini, G., Miotto, F., Sergi, G., & Busetto, L. (2004). Predictors of drop-out in overweight and obese outpatients. *International Journal Of Obesity, 29*, 122. doi: 10.1038/sj.ijo.0802846

Irving, L. M., & Neumark-Sztainer, D. (2002). Integrating the prevention of eating disorders and obesity: feasible or futile? *Prev Med, 34*. doi: 10.1006/pmed.2001.0997

Isaacs, A. J., & Parry, P. S. (1984). A clinical assessment of Modifast in U.K. general practice. *Postgraduate Medical Journal, 60*(SUPPL. 3), 74-82.

Jagosh, J., Macaulay, A. C., Pluye, P., Salsberg, J., Bush, P. L., Henderson, J., . . . Greenhalgh, T. (2012). Uncovering the benefits of participatory research: implications of a realist review for health research and practice. *Milbank Q, 90*(2), 311-346.

Jakicic, J. M., & Otto, A. D. (2005). Physical activity considerations for the treatment and prevention of obesity. *The American Journal of Clinical Nutrition, 82*(1), 226S-229S.

Jalayondeja, C., Jalayondeja, W., Mekhora, K., Bhuanantanondh, P., Dusadi-Isariyavong, A., & Upiriyasakul, R. (2017). Break in sedentary behavior reduces the risk of noncommunicable diseases and cardiometabolic risk factors among workers in a petroleum company. *International Journal of Environmental Research and Public Health, 14*(5), 501. doi: 10.3390/ijerph14050501

Jansen, S., Desbrow, B., & Ball, L. (2015). Obesity management by general practitioners: the unavoidable necessity. *Aust J Prim Health, 21*(4), 366-368. doi: 10.1071/py15018

Jarvis, S. (2006). Obesity and the overworked GP. *Br J Gen Pract, 56*(530), 654-655.

Jay, M., Gillespie, C., Schlair, S., Sherman, S., & Kalet, A. (2010). Physicians' use of the 5As in counseling obese patients: is the quality of counseling associated with patients' motivation and intention to lose weight? *BMC Health Services Research, 10*, 159-159. doi: 10.1186/1472-6963-10-159

Jay, M. R., Gillespie, C. C., Schlair, S. L., Savarimuthu, S. M., Sherman, S. E., Zabar, S. R., & Kalet, A. L. (2013). The impact of primary care resident physician training on patient weight loss at 12 months. *Obesity (Silver Spring), 21*(1), 45-50. doi: 10.1002/oby.20237

Jebb, S. A., Ahern, A. L., Olson, A. D., Aston, L. M., Holzapfel, C., Stoll, J., . . . Caterson, I. D. (2011). Primary care referral to a commercial provider for weight loss treatment versus standard care: a randomised controlled trial. *The Lancet, 378*(9801), 1485-1492.

Jensen, M. D., Ryan, D. H., Apovian, C. M., Ard, J. D., Comuzzie, A. G., Donato, K. A., . . . Tomaselli, G. F. (2014). 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. *Circulation, 129*(25 Suppl 2), S102-138.

Jerome, G. J., Yeh, H.-C., Dalcin, A., Reynolds, J., Gauvey-Kern, M. E., Charleston, J., . . . Appel, L. J. (2009). Treatment of obesity in primary care practice: The Practice Based Opportunities for Weight Reduction (POWER) Trial at Johns Hopkins. *Obesity and Weight Management, October*, 216-221.

Jolly, K., Daley, A., Adab, P., Lewis, A., Denley, J., Beach, J., & Aveyard, P. (2010). A randomised controlled trial to compare a range of commercial or primary care led weight reduction programmes with a minimal intervention control for weight loss in obesity: The Lighten Up trial. *BMC Public Health, 10*. doi: 10.1186/1471-2458-10-439

Jolly, K., Lewis, A., Beach, J., Denley, J., Adab, P., Deeks, J. J., . . . Aveyard, P. (2011). Comparison of range of commercial or primary care led weight reduction programmes with minimal intervention control for weight loss in obesity: Lighten Up randomised controlled trial. *BMJ, 343*. doi: 10.1136/bmj.d6500

Jonas, D. E., Ibuka, Y., & Russell, L. B. (2011). How much time do adults spend on health-related self-care? Results from the American Time Use Survey. *The Journal of the American Board of Family Medicine, 24*(4), 380-390. doi: 10.3122/jabfm.2011.04.100260

Kanke, S., Kawai, T., Takasawa, N., Mashiyama, Y., Ishii, A., & Kassai, R. (2015). Interventions for body weight reduction in obese patients during short consultations: An open-label randomized controlled trial in the Japanese primary care setting. *Asia Pacific Family Medicine*. doi: 10.1186/s12930-015-0022-7

Karmali, S., Johnson Stoklossa, C., Sharma, A., Stadnyk, J., Christiansen, S., Cottreau, D., & Birch, D. W. (2010). Bariatric surgery: a primer. *Can Fam Physician, 56*(9), 873-879.

Katz, S., Feigenbaum, A., Pasternak, S., & Vinker, S. (2005). An interactive course to enhance self-efficacy of family practitioners to treat obesity. *BMC Med Educ, 5*(1), 4.
Kausman, R., & Bruere, T. (2006). If not dieting, now what? *Aust Fam Physician, 35*(8), 572-575.
Kelley, J. M., Kraft-Todd, G., Schapira, L., Kossowsky, J., & Riess, H. (2014). The influence of the patient-clinician relationship on healthcare outcomes: a systematic review and meta-analysis of randomized controlled trials. *PLoS One, 9*(4), e94207.
Kerr, J., Patrick, K., Norman, G., Stein, M. B., Calfas, K., Zabinski, M., & Robinson, A. (2008). Randomized control trial of a behavioral intervention for overweight women: Impact on depressive symptoms. *Depression and Anxiety, 25*(7), 555-558.
Kim, K. K., Yeong, L.-L., Caterson, I. D., & Harris, M. F. (2015). Analysis of factors influencing general practitioners' decision to refer obese patients in Australia: a qualitative study. *BMC Family Practice, 16*, 45. doi: 10.1186/s12875-015-0262-5
Klein, D., Jeejeebhoy, K., Tremblay, A., Kallio, M., Rheaume, C., Humphries, S., . . . Mutch, D. M. (2017). The CHANGE program: Exercise intervention in primary care. *Can Fam Physician, 63*(7), 546-552.
Kloek, C. J., Tol, J., Veenhof, C., van der Wulp, I., & Swinkel, I. C. (2014). Dutch General Practitioners' weight management policy for overweight and obese patients. *BMC Obesity, 1*(2).
Klumbiene, J., Petkeviciene, J., Vaisvalavicius, V., & Miseviciene, I. (2006). Advising overweight persons about diet and physical activity in primary health care: Lithuanian health behaviour monitoring study. *BMC Public Health, 6*, 30. doi: 10.1186/1471-2458-6-30
Kolasa, K. (1999). Summary of clinical guidelines on the identification, evaluation, and treatment of overweight and obesity. *Journal of Nutrition Education, 31*(2), 114.
Kolasa, K. M., Collier, D. N., & Cable, K. (2010). Weight loss strategies that really work. *The Journal of Family Practice, 59*(7), 378-385.
Korhonen, P. E., Jarvenpaa, S., & Kautiainen, H. (2014). Primary care-based, targeted screening programme to promote sustained weight management. *Scand J Prim Health Care, 32*(1), 30-36. doi: 10.3109/02813432.2014.886493
Kraschnewski, J. L., Boan, J., Esposito, J., Sherwood, N. E., Lehman, E. B., Kephart, D. K., & Sciamanna, C. N. (2010). Long-term weight loss maintenance in the United States. *Int J Obes (Lond), 34*. doi: 10.1038/ijo.2010.94
Kraschnewski, J. L., Sciamanna, C. N., Stuckey, H. L., Chuang, C. H., Lehman, E. B., Hwang, K. O., . . . Nembhard, H. B. (2013). A Silent Response to the Obesity Epidemic: Decline in US Physician Weight Counseling. *Med Care, 51*, 186-192.
Kuk, J. L., Ardern, C. I., Church, T. S., Sharma, A. M., Padwal, R., & Sui, X. (2011). Edmonton Obesity Staging System: association with weight history and mortality risk. *Appl Physiol Nutr Metab, 36*. doi: 10.1139/h11-058
Kumanyika, S., Fassbender, J., Phipps, E., Tan-Torres, S., Localio, R., Morales, K. H., . . . Wadden, T. A. (2011). Design, recruitment and start up of a primary care weight loss trial targeting African American and Hispanic adults. *Contemp Clin Trials, 32*(2), 215-224. doi: 10.1016/j.cct.2010.11.002
Kumanyika, S. K., Fassbender, J. E., Sarwer, D. B., Phipps, E., Allison, K. C., Localio, R., . . . Wadden, T. A. (2012). One-year results of the Think Health! study of weight management in primary care practices. *Obesity (Silver Spring), 20*(6), 1249-1257. doi: 10.1038/oby.2011.329
Kuppersmith, N. C., & Miles, T. P. (2006). Effect of a BMI chart on weight management discussions in a primary care setting. *J Ky Med Assoc, 104*(11), 519-522.
Kushner, R. (2010). Tackling obesity: Is primary care up to the challenge? *Arch Intern Med, 170*(2), 121-123.
Kushner, R. F., & Ryan, D. H. (2014). Assessment and lifestyle management of patients with obesity: clinical recommendations from systematic reviews. *JAMA, 312*(9), 943-952. doi: 10.1001/jama.2014.10432

Laing, B. Y., Mangione, C. M., Tseng, C. H., Leng, M., Vaisberg, E., Mahida, M., . . . Bell, D. S. (2014). Effectiveness of a smartphone application for weight loss compared with usual care in overweight primary care patients: a randomized, controlled trial. *Ann Intern Med, 161*(10 Suppl), S5-12. doi: 10.7326/m13-3005

Lakka, T. A., & Bouchard, C. (2005). Physical activity, obesity and cardiovascular diseases. *Handb Exp Pharmacol*(170), 137-163.

Landau, C., & Moulton, A. (1992). General principles in the primary care of obesity. *Rhode Island Medicine, 75*(11), 527-530.

Laws, R. (2004a). Current approaches to obesity management in UK Primary Care: the Counterweight Programme. *J Hum Nutr Diet, 17*.

Laws, R. (2004b). A new evidence-based model for weight management in primary care: the Counterweight Programme. *Hum Nutr Diet, 17*.

Lenfant, C. (2001). Physicians Need Practical Tools to Treat the Complex Problems of Overweight and Obesity. *American Family Physician, 63*(11), 2139-2146.

Lewis, A., Jolly, K., Adab, P., Daley, A., Farley, A., Jebb, S., . . . Aveyard, P. (2013). A brief intervention for weight management in primary care: Study protocol for a randomized controlled trial. *Trials, 14*(1). doi: 10.1186/1745-6215-14-393

Lin, M., Mahmooth, Z., Dedhia, N., Frutchey, R., Mercado, C. E., Epstein, D. H., . . . Cheskin, L. J. (2015). Tailored, interactive text messages for enhancing weight loss among African American adults: the TRIMM randomized controlled trial. *Am J Med, 128*(8), 896-904. doi: 10.1016/j.amjmed.2015.03.013

Linne, Y., Rooth, P., & Rossner, S. (2003). Success rate of Orlistat in primary-care practice is limited by failure to follow prescribing recommendations: The referral letter content vs clinical reality. *International Journal Of Obesity, 27*(11), 1434-1435.

Logue, E., Sutton, K., Jarjoura, D., & Smucker, W. (2000). Obesity management in primary care: assessment of readiness to change among 284 family practice patients. *J Am Board Fam Pract, 13*(3), 164-171.

Logue, E., Sutton, K., Jarjoura, D., Smucker, W., Baughman, K., & Capers, C. (2005). Transtheoretical Model-Chronic Disease Care for Obesity in Primary Care: A Randomized Trial. *Obesity Research, 13*(5), 917-927.

Logue, E. E., Bourguet, C. C., Palmieri, P. A., Scott, E. D., Matthews, B. A., Dudley, P., & Chipman, K. J. (2012). The better weight-better sleep study: A pilot intervention in primary care. *American Journal of Health Behavior, 36*(3), 319-334.

Logue, E. E., & Smucker, W. D. (2001). Obesity management in primary care: changing the status quo. *J Fam Pract, 50*(6), 520.

Lowe, M. R., Butryn, M. L., Thomas, J., & Coletta, M. (2014). Meal replacements, reduced energy density eating, and weight loss maintenance in primary care patients: A randomized controlled trial. *Obesity, 22*(1), 94-100.

Lowery, B. (2010). Medical Home Concept: Policy implications for an integrated approach in obesity management. *Bariatric Nursing and Surgical Patient Care, 5*(1), 89-91.

Lucini, D., Cesana, G., Vigo, C., Malacarne, M., & Pagani, M. (2015). Reducing weight in an internal medicine outpatient clinic using a lifestyle medicine approach: A proof of concept. *Eur J Intern Med, 26*(9), 680-684. doi: 10.1016/j.ejim.2015.05.020

Lyznicki, J. M., Young, D. C., Riggs, J. A., & Davis, R. M. (2001). Obesity: assessment and management in primary care. *Am Fam Physician, 63*(11), 2185-2196.

Madigan, C. D., Jolly, K., Lewis, A. L., Aveyard, P., & Daley, A. J. (2014). A randomised controlled trial of the effectiveness of self-weighing as a weight loss intervention. *The International Journal of Behavioral Nutrition and Physical Activity Vol 11 Oct 2014, ArtID 125, 11*.

Manson , J. E., Willett , W. C., Stampfer , M. J., Colditz , G. A., Hunter , D. J., Hankinson , S. E., . . . Speizer , F. E. (1995). Body Weight and Mortality among Women. *New England Journal of Medicine, 333*(11), 677-685. doi: 10.1056/nejm199509143331101

Martin, P. D., Dutton, G. R., Rhode, P. C., Horswell, R. L., Ryan, D. H., & Brantley, P. J. (2008). Weight loss maintenance following a primary care intervention for low-income minority women. *Obesity (Silver Spring), 16*(11), 2462-2467.

Martin, P. D., Rhode, P. C., Howe, J. T., & Brantley, P. J. (2003). Primary care weight management counseling: physician and patient perspectives. *The Journal of the Louisiana State Medical Society : official organ of the Louisiana State Medical Society, 155*(1), 52-56.

Martinez, J. A., Wertheim, B. C., Thomson, C. A., Bea, J. W., Wallace, R., Allison, M., . . . Thompson, P. A. (2017). Physical activity modifies the association between dietary protein and lean mass of postmenopausal women. *J Acad Nutr Diet, 117*(2), 192-203.e191. doi: 10.1016/j.jand.2016.10.009

Maryon-Davis, A. (2005). Weight management in primary care: how can it be made more effective? *Proc Nutr Soc, 64*(1), 97-103.

Mathus-Vliegen, L., Toouli, J., Fried, M., Khan, A. G., Garisch, J., Hunt, R., . . . Krabshuis, J. (2011). *Obesity*. http://www.worldgastroenterology.org/guidelines/global-guidelines/obesity/obesity-english.

McClure, K. J., Puhl, R. M., & Heuer, C. A. (2011). Obesity in the news: do photographic images of obese persons influence antifat attitudes? *J Health Commun, 16*.

McDoniel, S. (2008). *The short-term effect of a technology based comprehensive weight reduction program for obese adults in a primary care medical clinic: A three month psychobehavioral study.* Capella University. (3330941)

McDoniel, S. O., Wolskee, P., & Shen, J. (2010). Treating obesity with a novel hand-held device, computer software program, and Internet technology in primary care: The SMART motivational trial. *Patient Educ Couns, 79*(2), 185-191.

McLaren, L., Groot, J., Adair, C. E., & Russell-Mayhew, S. (2012). Socioeconomic position, social inequality, and weight-related issues. In G. McVey, M. Levine, N. Piran & B. Ferguson (Eds.), *Preventing eating-related and weight-related disorders collaborative research, advocacy, and policy change*. Waterloo: Wilfred Laurier University Press.

McQuigg, M., Brown, J., Broom, J., Laws, R. A., Reckless, J. P. D., Noble, P. A., . . . Hole, D. J. (2005). Empowering primary care to tackle the obesity epidemic: The Counterweight programme. *European Journal of Clinical Nutrition, 59*(SUPPL. 1), S93-S101.

McQuigg, M., Brown, J. E., Broom, J., Laws, R. A., Reckless, J. P., Noble, P. A., . . . Radziwonik, S. (2008). The Counterweight programme: Prevalence of CVD risk factors by body mass index and the impact of 10% weight change. *Obes Res Clin Pract, 2*(1), I-ii.

McQuigg, M., Brown, J. E., Broom, J. I., Laws, R. A., Reckless, J. P., Noble, P. A., . . . Radziwonik, S. (2008). Engaging patients, clinicians and health funders in weight management: the Counterweight Programme. *Fam Pract, 25 Suppl 1*, i79-86.

McTigue, K. M., Bhargava, T., Bryce, C. L., Conroy, M., Fischer, G. S., Hess, R., . . . Zickmund, S. (2011). Patient perspectives on the integration of an intensive online behavioral weight loss intervention into primary care. *Patient Educ Couns, 83*(2), 261-264

McTigue, K. M., Conroy, M. B., Hess, R., Bryce, C. L., Fiorillo, A. B., Fischer, G. S., . . . Simkin-Silverman, L. R. (2009). Using the Internet to translate an evidence-based lifestyle intervention into practice. *Telemedicine and e-Health, 15*(9), 851-858.

McVey, G. L., Walker, K. S., Beyers, J., Harrison, H. L., Simkins, S. W., & Russell-Mayhew, S. (2013). Integrating weight bias awareness and mental health promotion into obesity prevention delivery: a public health pilot study. *Prev Chronic Dis., 10*.

Mehring, M., Haag, M., Linde, K., Wagenpfeil, S., Frensch, F., Blome, J., & Schneider, A. (2013). Effects of a general practice guided web-based weight reduction program - Results of a cluster-randomized controlled trial. *BMC Family Practice, 14*.

Melis, R. J. F., Teerenstra, S., Rikkert, M. G. M. O., & Borm, G. F. (2008). Pseudo cluster randomization performed well when used in practice. *J Clin Epidemiol, 61*(11), 1169-1175. doi: https://doi.org/10.1016/j.jclinepi.2007.12.001

Mercer, S. (2009). How useful are clinical guidelines for the management of obesity in general practice? *Br J Gen Pract, 59*(568), 863-868. doi: 10.3399/bjgp09X472917

Mogul, H., Rau, J., Weinstein, B., Zhang, S., & Peterson, S. (1999). New perspectives on diagnosis and treatment of obesity. *Heart Disease, 1*(5), 295-304.

Moore, H., Summerbell, C. D., Greenwood, D. C., Tovey, P., Griffiths, J., Henderson, M., . . . Adamson, A. J. (2003). Improving management of obesity in primary care: cluster randomised trial. *BMJ, 327*(7423), 1085. doi: 10.1136/bmj.327.7423.1085

Morris, S., & Gravelle, H. (2008). GP supply and obesity. *Journal of Health Economics, 27*(5), 1357-1367.

Morris, S. E., Lean, M. E., Hankey, C. R., & Hunter, C. (1999). Who gets what treatment for obesity? A survey of GPs in Scotland. *Eur J Clin Nutr, 53 Suppl 2*, S44-48.

Moyer, V. A. (2012). Screening for and management of obesity in adults: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med, 157*(5), 373-378. doi: 10.7326/0003-4819-157-5-201209040-00475

Munsch, S., Biedert, E., & Keller, U. (2003). Evaluation of a lifestyle change programme for the treatment of obesity in general practice. *Swiss Med Wkly, 133*(9-10), 148-154.

National Aboriginal Community Controlled Health Organisation (NACCHO) and The Royal Australian College of General Practitioners (RACGP). (2012). Overweight/Obesity *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* (Second edition ed.). Melbourne: Royal Australian College of General Practitioners.

National Rural Health Alliance. (2004). Under pressure and under-valued: allied health professionals in rural and remote areas. Available at http://ruralhealth.org.au/sites/default/files/position-papers/position-paper-04-11-05.pdf [Verified 5 October 2017]: National Rural Health Alliance.

Newton, R. L., Milsom, V. A., Nackers, L. M., & Anton, S. D. (2007). Supporting behavior change in overweight patients: A guide for the primary care physician. *JCOM, 15*(11), 536-544.

New Zealand Guidelines Group. (2012). *New Zealand Primary Care Handbook 2012*. Wellington, New Zealand.

Nichols, J., & Bazemore, A. (2014). Winnable battles: family physicians play an essential role in addressing tobacco use and obesity. *Am Fam Physician, 89*(11), 872.

Nonas, C. A. (1998). A model for chronic care of obesity through dietary treatment. *J Am Diet Assoc, 98*(10 Suppl 2), S16-22.

O'Grady, J. S., Thacher, T. D., & Chaudhry, R. (2013). The effect of an automated clinical reminder on weight loss in primary care. *J Am Board Fam Med, 26*(6), 745-750. doi: 10.3122/jabfm.2013.06.120340

O'Hara, L. G. J. (2013). Human rights casualties from the "War on Obesity": Why focusing on body weight is inconsistent with a human rights approach to health. *Fat Stud., 1*. doi: 10.1080/21604851.2012.627790

Olander EK, Fletcher H, Williams S, Atkinson L, Turner A, French DP. What are the most effective techniques in changing obese individuals' physical activity self-efficacy and behaviour: a systematic review and meta-analysis. The International Journal of Behavioral Nutrition and Physical Activity 2013; 10: 29-.

Olsen, J., Willaing, I., Ladelund, S., Jørgensen, T., Gundgaard, J., & Sørensen, J. (2005). Cost-effectiveness of nutritional counseling for obese patients and patients at risk of ischemic heart disease. *International Journal of Technology Assessment in Health Care, 21*(2), 194-202.

Orzano, A. J., & Scott, J. G. (2004). Diagnosis and treatment of obesity in adults: an applied evidence-based review. *J Am Board Fam Pract, 17*(5), 359-369.

Ossolinski, G., Jiwa, M., & McManus, A. (2015). Weight management practices and evidence for weight loss through primary care: a brief review. *Curr Med Res Opin, 31*(11), 2011-2020. doi: 10.1185/03007995.2015.1082993

Osunlana, A. M., Asselin, J., Anderson, R., Ogunleye, A. A., Cave, A., Sharma, A. M., & Campbell-Scherer, D. L. (2015). 5As Team obesity intervention in primary care: development and evaluation of shared decision-making weight management tools. *Clin Obes, 5*(4), 219-225. doi: 10.1111/cob.12105

Padwal, R. S., Pajewski, N. M., Allison, D. B., & Sharma, A. M. (2011). Using the Edmonton obesity staging system to predict mortality in a population-representative cohort of people with overweight and obesity. *CMAJ, 183*. doi: 10.1503/cmaj.110387

Patterson, L., Patterson, C., Kee, F., Hughes, C., Donnelly, M., & O'Reilly, D. (2013). Prescribing for weight loss in primary care: Evidence from a population based study. *Journal of Epidemiology and Community Health, 67*(5), 530-532. doi: 10.1136/jech-2012-201995

Pawson, R., & Tilley, N. (1997). *Realistic Evaluation*. London: Sage.

Pearce-Brown, C. L., Grealish, L., McRae, I. S., Douglas, K. A., Yen, L. E., Wells, R. W., & Wareham, S. (2011). A local study of costs for private allied health in Australian primary health care: variability and policy implications. *Australian Journal of Primary Health, 17*(2), 131-134. doi: https://doi.org/10.1071/PY10029

Pearl, R. L., Puhl, R. M., & Brownell, K. D. (2012). Positive media portrayals of obese persons: impact on attitudes and image preferences. *Health Psychol, 31*. doi: 10.1037/a0027189

Pearl, R. L., Puhl, R. M., & Dovidio, J. F. (2015). Differential effects of weight bias experiences and internalization on exercise among women with overweight and obesity. *J Health Psychol, 20*. doi: 10.1177/1359105313520338

Pearl, R. L., White, M. A., & Grilo, C. M. (2014a). Overvaluation of shape and weight as a mediator between self-esteem and weight bias internalization among patients with binge eating disorder. *Eat Behav, 15*. doi: 10.1016/j.eatbeh.2014.03.005

Pearl, R. L., White, M. A., & Grilo, C. M. (2014b). Weight bias internalization, depression, and self-reported health among overweight binge eating disorder patients. *Obesity (Silver Spring), 22*. doi: 10.1002/oby.20617

Pellegrini, C. A., Hoffman, S. A., Collins, L. M., & Spring, B. (2014). Optimization of remotely delivered intensive lifestyle treatment for obesity using the Multiphase Optimization Strategy: Opt-IN study protocol. *Contemporary Clinical Trials, 38*(2), 251-259. doi: 10.1016/j.cct.2014.05.007

Pfadenhauer, L. M., Gerhardus, A., Mozygemba, K., Lysdahl, K. B., Booth, A., Hofmann, B., . . . Rehfuess, E. (2017). Making sense of complexity in context and implementation: the Context and Implementation of Complex Interventions (CICI) framework. *Implementation Science, 12*(1), 21. doi: 10.1186/s13012-017-0552-5

Phelan, S. M., Burgess, D. J., Puhl, R., Dyrbye, L. N., Dovidio, J. F., Yeazel, M., . . . van Ryn, M. (2015). The adverse effect of weight stigma on the well-being of medical students with overweight or obesity: findings from a National Survey. *Journal of General Internal Medicine, 30*(9), 1251-1258. doi: 10.1007/s11606-015-3266-x

Phelan, S. M., Burgess, D. J., Yeazel, M. W., Hellerstedt, W. L., Griffin, J. M., & van Ryn, M. (2015). Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. *Obesity Reviews, 16*(4), 319-326. doi: 10.1111/obr.12266

Pickering, R. P., Goldstein, R. B., & Hasin, D. S. (2011). Temporal relationships between overweight and obesity and DSM-IV substance use, mood, and anxiety disorders: results from a prospective study, the National epidemiologic survey on alcohol and related conditions. *J Clin Psychiatry., 72*. doi: 10.4088/JCP.10m06077gry

Pietras, S. M., Usdan, L. S., & Apovian, C. M. (2007). Preoperative and postoperative management of the bariatric surgical patient. *JCOM, 14*(5), 262-274.

Plourde, G., & Prud'homme, D. (2012). Managing obesity in adults in primary care. *CMAJ : Canadian Medical Association Journal, 184*(9), 1039-1044. doi: 10.1503/cmaj.111640

Poirier, P., & Despres, J. P. (2001). Exercise in weight management of obesity. *Cardiol Clin, 19*(3), 459-470.

Pomeranz, J. L. (2008). A historical analysis of public health, the law, and stigmatized social groups: the need for both obesity and weight bias legislation. *Obesity (Silver Spring), 16*. doi: 10.1038/oby.2008.452
Pratt, B. M., & Woolfenden, S. (2002). Interventions for preventing eating disorders in children and adolescents. *Cochrane Database Syst Rev., 2*.
Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *J Consult Clin Psychol, 51*(3), 390-395.
Puhl, R., Luedicke, J., & Peterson, J. L. (2013). Public reactions to obesity-related health campaigns: a randomized controlled trial. *Am J Prev Med, 45*.
Puhl, R., Peterson, J. L., & Luedicke, J. (2013). Fighting obesity or obese persons? Public perceptions of obesity-related health messages. *Int J Obes (Lond), 37*.
Puhl, R., & Suh, Y. (2015). Stigma and eating and weight disorders. *Curr Psychiatry Rep, 17*. doi: 10.1007/s11920-015-0552-6
Puhl, R. M., & Brownell, K. D. (2006). Confronting and coping with weight stigma: an investigation of overweight and obese adults. *Obesity (Silver Spring), 14*.
Puhl, R. M., Heuer, C., & Sarda, V. (2011). Framing messages about weight discrimination: impact on public support for legislation. *Int J Obes (Lond), 35*.
Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: a review and update. *Obesity (Silver Spring), 17*. doi: 10.1038/oby.2008.636
Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: important considerations for public health. *Am J Public Health, 100*. doi: 10.2105/ajph.2009.159491
Puhl, R. M., Latner, J. D., O'Brien, K. S., Luedicke, J., Danielsdottir, S., & Salas, X. R. (2015). Potential policies and laws to prohibit weight discrimination: public views from 4 countries. *Milbank Q, 93*. doi: 10.1111/1468-0009.12162
Puhl, R. M., Luedicke, J., & Heuer, C. (2011). Weight-based victimization toward overweight adolescents: observations and reactions of peers. *J Sch Health, 81*.
Puhl, R. M., Moss-Racusin, C. A., & Schwartz, M. B. (2007). Internalization of weight bias: implications for binge eating and emotional well-being. *Obesity (Silver Spring), 15*.
Puhl, R. M., Neumark-Sztainer, D., Austin, S. B., Luedicke, J., & King, K. M. (2014). Setting policy priorities to address eating disorders and weight stigma: views from the field of eating disorders and the US general public. *BMC Public Health., 14*. doi: 10.1186/1471-2458-14-524
Ramos Salas, X. (2015). The ineffectiveness and unintended consequences of the public health war on obesity. *Can J Public Health, 106*(2), e79-81. doi: 10.17269/cjph.106.4757
Rao, G. (2010). Office-based strategies for the management of obesity. *Am Fam Physician, 81*(12), 1449-1456 ; quiz 1429.
Rao, G., Burke, L. E., Spring, B. J., Ewing, L. J., Turk, M., Lichtenstein, A. H., . . . Coons, M. (2011). New and emerging weight management strategies for busy ambulatory settings: a scientific statement from the American Heart Association endorsed by the Society of Behavioral Medicine. *Circulation, 124*(10), 1182-1203.
Reeve, J., Irving, G., & Freeman, G. (2013). Dismantling Lord Moran's ladder: the primary care expert generalist. *The British Journal of General Practice, 63*(606), 34-35.
Richardson, L. A. (2010). Bariatric society is here to help. *The Journal of Family Practice, 59*(9), 488.
Richman, R. M., Webster, P., Salgo, A. R., Mira, M., Steinbeck, K. S., & Caterson, I. D. (1996). A shared care approach in obesity management: the general practitioner and a hospital based service. *Int J Obes Relat Metab Disord, 20*(5), 413-419.
Ritzwoller, D. P., Glasgow, R. E., Sukhanova, A. Y., Bennett, G. G., Warner, E. T., Greaney, M. L., . . . Colditz, G. A. (2013). Economic analyses of the be fit be well program: A weight loss program for community health centers. *Journal of General Internal Medicine, 28*(12), 1581-1588. doi: 10.1007/s11606-013-2492-3
Robinson, B. E., Gjerdingen, D. K., & Houge, D. R. (1995). Obesity: a move from traditional to more patient-oriented management. *J Am Board Fam Pract, 8*(2), 99-108.

Rodondi, N., Humair, J. P., Ghali, W. A., Ruffieux, C., Stoianov, R., Seematter-Bagnoud, L., . . . Cornuz, J. (2006). Counselling overweight and obese patients in primary care: a prospective cohort study. *Eur J Cardiovasc Prev Rehabil, 13*(2), 222-228.

Rosenberger, P. H., Henderson, K. E., Bell, R. L., & Grilo, C. M. (2007). Associations of weight-based teasing history and current eating disorder features and psychological functioning in bariatric surgery patients. *Obes Surg, 17*. doi: 10.1007/s11695-007-9082-6

Ross, H., Laws, R., Reckless, J., & Lean, M. (2008). Evaluation of the Counterweight Programme for obesity management in primary care: a starting point for continuous improvement. *British Journal of General Practice, 58*(553), 548-554. doi: 10.3399/bjgp08X319710

Ross, R., Blair, S. N., Godwin, M., Hotz, S., Katzmarzyk, P. T., Lam, M., . . . Macdonald, S. (2009). Prevention and Reduction of Obesity through Active Living (PROACTIVE): rationale, design and methods. *Br J Sports Med, 43*(1), 57-63. doi: 10.1136/bjsm.2008.053504

Ross, R., Lam, M., Blair, S. N., Church, T. S., Godwin, M., Hotz, S. B., . . . MacDonald, S. (2012). Trial of prevention and reduction of obesity through active living in clinical settings: a randomized controlled trial. *Arch Intern Med, 172*(5), 414-424.

Rudolph, C. W., Wells, C. L., Weller, M. D., & Baltes, B. B. (2009). A meta-analysis of empirical studies of weight-based bias in the workplace. *J Vocat Behav, 74*.

Rueda-Clausen, C. F., Benterud, E., Bond, T., Olszowka, R., Vallis, M. T., & Sharma, A. M. (2014). Effect of implementing the 5As of Obesity Management framework on provider–patient interactions in primary care. *Clin Obes, 4*(1), 39-44. doi: 10.1111/cob.12038

Ruser, C. B., Federman, D. G., & Kashaf, S. S. (2005). Whittling away at obesity and overweight. Small lifestyle changes can have the biggest impact. *Postgrad Med, 117*(1), 31-34, 37-40.

Russell-Mayhew, S. (2006). Stop the war on weight; eating disorder and obesity prevention working together toward health. *Eat Disord J Treat Prev, 14*. doi: 10.1080/10640260600639301

Rutten, G. M., Meis, J. J., Hendriks, M. R., Hamers, F. J., Veenhof, C., & Kremers, S. P. (2014). The contribution of lifestyle coaching of overweight patients in primary care to more autonomous motivation for physical activity and healthy dietary behaviour: Results of a longitudinal study. *The International Journal of Behavioral Nutrition and Physical Activity Vol 11 Jul 2014, ArtID 86, 11*.

Ryan, D. H., Johnson, W. D., Myers, V. H., Prather, T. L., McGlone, M. M., Rood, J., . . . Sjostrom, L. V. (2010). Nonsurgical weight loss for extreme obesity in primary care settings: results of the Louisiana Obese Subjects Study. *Arch Intern Med, 170*(2), 146-154.

Safford, M. M., Russell, L., Suh, D.-C., Roman, S., & Pogach, L. (2005). How Much Time Do Patients with Diabetes Spend on Self-Care? *The Journal of the American Board of Family Practice, 18*(4), 262-270. doi: 10.3122/jabfm.18.4.262

Sammut, D., Sammut, D., & Bonnici, J. (2012). Audit of the diagnosis and management of adult obesity in a Maltese general practice. *Malta Medical Journal, 24*(1), 16-20.

Sanchez-Carracedo, D., Neumark-Sztainer, D., & Lopez-Guimera, G. (2012). Integrated prevention of obesity and eating disorders: barriers, developments and opportunities. *Public Health Nutr, 15*. doi: 10.1017/s1368980012000705

Saris, W. H. M., Koenders, M. C., Pannemans, D. L. E., & Van Baak, M. A. (1992). Outcome of a multicenter outpatient weight-management program including very-low-calorie diet and exercise. *American Journal of Clinical Nutrition, 56*(SUPPL. 1), 294S-296S.

Sarwer, D., Moore, R., Diewald, L., Chittams, J., Berkowitz, R., Vetter, M., . . . Wadden, T. (2013). The impact of a primary care-based weight loss intervention on the quality of life. *International Journal Of Obesity, 37*(Supp 1), S25-S30.

Scherger, J. (1999). Primary care physicians: On the front line in the fight against obesity. *Cardiovascular reviews and reports, 20*(5), 268-270.

Schlair, S., Moore, S., McMacken, M., & Jay, M. (2012). How to deliver high-quality obesity counseling in primary care using the 5As framework. *JCOM, 19*(5), 221-229.

Schuster, R. J., Tasosa, J., & Terwoord, N. A. (2008). Translational research--implementation of NHLBI Obesity Guidelines in a primary care community setting: the Physician Obesity Awareness Project. *J Nutr Health Aging, 12*(10), 764s-769s.

Schvey, N. A., Puhl, R. M., & Brownell, K. D. (2011). The impact of weight stigma on caloric consumption. *Obesity (Silver Spring), 19*. doi: 10.1038/oby.2011.204

Seidell, J. C., Halberstadt, J., Noordam, H., & Niemer, S. (2012). An integrated health care standard for the management and prevention of obesity in The Netherlands. *Fam Pract, 29 Suppl 1*, i153-i156. doi: 10.1093/fampra/cmr057

Shafipour, P., Der-Sarkissian, J. K., Hendee, F. N., & Coleman, K. J. (2009). What do I do with my morbidly obese patient? A detailed case study of bariatric surgery in Kaiser Permanente Southern California. *The Permanente Journal, 13*(4), 56-63.

Sharma, A. M., & Campbell-Scherer, D. L. (2017). Redefining obesity: beyond the numbers. *Obesity, 25*(4), 660-661. doi: 10.1002/oby.21801

Sharma, A. M., & Kushner, R. F. (2009). A proposed clinical staging system for obesity. *Int J Obes (Lond), 33*(3), 289-295. doi: 10.1038/ijo.2009.2

Sherman, R., Crocker, B., Dill, D., & Judge, D. (2013). Health coaching integration into primary care for the treatment of obesity. *Glob Adv Health Med, 2*(4), 58-60. doi: 10.7453/gahmj.2013.017

Simkin-Silverman, L. R., Conroy, M. B., & King, W. C. (2008). Treatment of overweight and obesity in primary care practice: current evidence and future directions. *American Journal of Lifestyle Medicine, 2*(4), 296-304. doi: 10.1177/1559827608317287

Smith, A. W., Borowski, L. A., Liu, B., Galuska, D. A., Signore, C., Klabunde, C., . . . Ballard-Barbash, R. (2011). U.S. primary care physicians' diet-, physical activity-, and weight-related care of adult patients. *Am J Prev Med, 41*(1), 33-42.

Snow, V., Barry, P., Fitterman, N., Qaseem, A., & Weiss, K. (2005). Pharmacologic and surgical management of obesity in primary care: a clinical practice guideline from the American College of Physicians. *Ann Intern Med, 142*(7), 525-531.

Sonntag, U., Henkel, J., Renneberg, B., Bockelbrink, A., Braun, V., & Heintze, C. (2010). Counseling overweight patients: analysis of preventive encounters in primary care. *International Journal for Quality in Health Care, 22*(6), 486-492.

Spira, M. (1983). Managing obesity in general practice. *Practitioner, 227*(1378), 625-629.

Stafford, R. S., Farhat, J. H., Misra, B., & Schoenfeld, D. A. (2000). National patterns of physician activities related to obesity management. *Arch Fam Med, 9*(7), 631-638.

Stamps, P. L., Catino, D. C., & Feola, A. C. (1983). Treatment of obesity in three rural primary care practices. *The Journal of Family Practice, 17*(4), 629-634.

Stange, K. C. (2009a). The generalist approach. *Annals of Family Medicine, 7*(3), 198-203. doi: 10.1370/afm.1003

Stange, K. C. (2009b). The problem of fragmentation and the need for integrative solutions. *The Annals of Family Medicine, 7*(2), 100-103. doi: 10.1370/afm.971

Stange, K. C., & Ferrer, R. L. (2009). The paradox of primary care. *The Annals of Family Medicine, 7*(4), 293-299. doi: 10.1370/afm.1023

Star, A., Hay, P., Quirk, F., & Mond, J. (2015). Perceived discrimination and favourable regard toward underweight, normal weight and obese eating disorder sufferers: implications for obesity and eating disorder population health campaigns. *BMC Obes., 2*. doi: 10.1186/s40608-014-0032-2

Starfield, B. (2011). Is patient-centered care the same as person-focused care? *The Permanente Journal, 15*(2), 63-69.

Starfield, B., Shi, L., & Macinko, J. (2005). Contribution of primary care to health systems and health. *Milbank Q, 83*(3), 457-502. doi: 10.1111/j.1468-0009.2005.00409.x

Steinberg, D. M., Levine, E. L., Lane, I., Askew, S., Foley, P. B., Puleo, E., & Bennett, G. G. (2014). Adherence to self-monitoring via interactive voice response technology in an eHealth

intervention targeting weight gain prevention among Black women: Randomized controlled trial. *Journal of Medical Internet Research, 16*(4), 1-12.

Stephens, G. S., Blanken, S. E., Greiner, K. A., & Chumley, H. S. (2008). Visual prompt poster for promoting patient-physician conversations on weight loss. *Annals of Family Medicine, 6*(SUPPL. 1), S33-S36. doi: 10.1370/afm.780

Steptoe, A., Rink, E., & Kerry, S. (2000). Psychosocial predictors of changes in physical activity in overweight sedentary adults following counseling in primary care. *Preventive Medicine: An International Journal Devoted to Practice and Theory, 31*(2,Pt.1), 183-194.

Sturgiss, E., Jay, M., Campbell-Scherer, D., & van Weel, C. (2017). Challenging assumptions in obesity research. *BMJ, 359*. doi: 10.1136/bmj.j5303

Sumithran, P., Prendergast, L. A., Delbridge, E., Purcell, K., Shulkes, A., Kriketos, A., & Proietto, J. (2011). Long-term persistence of hormonal adaptations to weight loss. *New England Journal of Medicine, 365*(17), 1597-1604. doi: 10.1056/NEJMoa1105816

Sumithran, P., & Proietto, J. (2013). The defence of body weight: a physiological basis for weight regain after weight loss. *Clin Sci (Lond), 124*. doi: 10.1042/cs20120223

Sutin, A. R., Stephan, Y., & Terracciano, A. (2015). Weight discrimination and risk of mortality. *Psychol Sci, 26*. doi: 10.1177/0956797615601103

Tan, D., Zwar, N. A., Dennis, S. M., & Vagholkar, S. (2006). Weight management in general practice: what do patients want? *Med J Aust, 185*(2), 73-75.

Teerenstra, S., Melis, R. J., Peer, P. G., & Borm, G. F. (2006). Pseudo cluster randomization dealt with selection bias and contamination in clinical trials. *J Clin Epidemiol, 59*(4), 381-386. doi: 10.1016/j.jclinepi.2005.10.003

ter Bogt, N. C., Bemelmans, W. J., Beltman, F. W., Broer, J., Smit, A. J., & van der Meer, K. (2009). Preventing weight gain: one-year results of a randomized lifestyle intervention. *Am J Prev Med, 37*(4), 270-277. doi: 10.1016/j.amepre.2009.06.011

ter Bogt, N. C., Bemelmans, W. J., Beltman, F. W., Broer, J., Smit, A. J., & van der Meer, K. (2011). Preventing weight gain by lifestyle intervention in a general practice setting: three-year results of a randomized controlled trial. *Arch Intern Med, 171*(4), 306-313.

ter Bogt, N. C., Milder, I. E., Bemelmans, W. J., Beltman, F. W., Broer, J., Smit, A. J., & van der Meer, K. (2011). Changes in lifestyle habits after counselling by nurse practitioners: 1-year results of the Groningen Overweight and Lifestyle study. *Public Health Nutr, 14*(6), 995-1000. doi: 10.1017/s1368980010003708

Thomas, J. G., Leahey, T. M., & Wing, R. R. (2015). An automated internet behavioral weight-loss program by physician referral: a randomized controlled trial. *Diabetes Care, 38*(1), 9-15. doi: 10.2337/dc14-1474

Thompson, W. G., Cook, D. A., Clark, M. M., Bardia, A., & Levine, J. A. (2007). Treatment of obesity. *Mayo Clin Proc, 82*(1), 93-101; quiz 101-102. doi: 10.4065/82.1.93

Timmerman, G. M., Reifsnider, E., & Allan, J. D. (2000). Weight management practices among primary care providers. *J Am Acad Nurse Pract, 12*(4), 113-116.

Tobacco Use and Dependence Guideline Panel. (2008). Treating tobacco use and dependence: 2008 update. Rockville, MD: US Department of Health and Human Services.

Torti, J., Luig, T., Borowitz, M., Johnson, J. A., Sharma, A. M., & Campbell-Scherer, D. L. (2017). The 5As team patient study: patient perspectives on the role of primary care in obesity management. *BMC Fam Pract, 18*(1), 19. doi: 10.1186/s12875-017-0596-2

Toth-Capelli, K. M., Brawer, R., Plumb, J., & Daskalakis, C. (2013). Stage of change and other predictors of participant retention in a behavioral weight management program in primary care. *Health Promotion Practice, 14*(3), 441-450.

Treadwell, H., Holden, K., Hubbard, R., Harper, F., Wright, F., Ferrer, M., . . . Kim, E. K. (2010). Addressing obesity and diabetes among african american men: Examination of a community-based model of prevention. *Journal of the National Medical Association, 102*(9), 794-802.

Tsai, A. G., Carvajal, R., Egner, R., & Wadden, T. A. (2010). Obesity. In R. DiTomasso, B. Golden & H. Morris (Eds.), *Handbook of cognitive behavioral approaches in primary care* (pp. 595-630). New York: Springer Publishing Company.

Tsai, A. G., Felton, S., Hill, J. O., & Atherly, A. J. (2012). A randomized pilot trial of a full subsidy vs. a partial subsidy for obesity treatment. *Obesity, 20*(9), 1838-1843.

Tsai, A. G., Felton, S., Wadden, T. A., Hosokawa, P. W., & Hill, J. O. (2015). A randomized clinical trial of a weight loss maintenance intervention in a primary care population. *Obesity (Silver Spring), 23*(10), 2015-2021. doi: 10.1002/oby.21224

Tsai, A. G., Wadden, T. A., Rogers, M. A., Day, S. C., Moore, R. H., & Islam, B. J. (2010). A primary care intervention for weight loss: Results of a randomized controlled pilot study. *Obesity, 18*(8), 1614-1618.

Tsai, A. G., Wadden, T. A., Volger, S., Sarwer, D. B., Vetter, M., Kumanyika, S., . . . Glick, H. A. (2013). Cost-effectiveness of a primary care intervention to treat obesity. *Int J Obes (Lond), 37 Suppl 1*, S31-37. doi: 10.1038/ijo.2013.94

Turner, L. R., Harris, M. F., & Mazza, D. (2015). Obesity management in general practice: does current practice match guideline recommendations? *Med J Aust, 202*(7), 370-372.

Vallis, M., Piccinini-Vallis, H., Sharma, A. M., & Freedhoff, Y. (2013). Modified 5 As: Minimal intervention for obesity counseling in primary care. *Canadian Family Physician, 59*(1), 27-31+e21-e25.

van Avendonk, M. J., Mensink, P. A., Drenthen, A. J., & van Binsbergen, J. J. (2012). Primary care and public health a natural alliance? The introduction of the guidelines for obesity and undernutrition of the Dutch College of General Practitioners. *Fam Pract, 29 Suppl 1*, i31-35. doi: 10.1093/fampra/cmr095

van Rossem, C., Spigt, M., Viechtbauer, W., Lucas, A. E. M., van Schayck, O. C. P., & Kotz, D. Effectiveness of intensive practice nurse counselling versus brief general practitioner advice, both combined with varenicline, for smoking cessation: a randomized pragmatic trial in primary care. *Addiction*, n/a-n/a. doi: 10.1111/add.13927

Van Sickle, K. R. (2007). Management of the challenging bariatric surgical patient. *Med Clin North Am, 91*(3), 383-392, x. doi: 10.1016/j.mcna.2007.02.003

Vartanian, L. R., & Novak, S. A. (2011). Internalized societal attitudes moderate the impact of weight stigma on avoidance of exercise. *Obesity (Silver Spring), 19*. doi: 10.1038/oby.2010.234

Vetter, M. L., Wadden, T. A., Chittams, J., Diewald, L. K., Panigrahi, E., Volger, S., . . . Moore, R. H. (2013). Effect of lifestyle intervention on cardiometabolic risk factors: results of the POWER-UP trial. *Int J Obes (Lond), 37 Suppl 1*, S19-24. doi: 10.1038/ijo.2013.92

Virji, A., & Murr, M. M. (2006). Caring for patients after bariatric surgery. *American Family Physician, 73*(8), 1403-1408.

Volger, S., Wadden, T. A., Sarwer, D. B., Moore, R. H., Chittams, J., Diewald, L. K., . . . Vetter, M. L. (2013). Changes in eating, physical activity and related behaviors in a primary care-based weight loss intervention. *Int J Obes (Lond), 37 Suppl 1*, S12-18. doi: 10.1038/ijo.2013.91

Wadden, T. A., Berkowitz, R. I., Vogt, R. A., Steen, S. N., Stunkard, A. J., & Foster, G. D. (1997). Lifestyle modification in the pharmacologic treatment of obesity: A pilot investigation of a potential primary care approach. *Obesity Research, 5*(3), 218-226.

Wadden, T. A., Berkowitz, R. I., Womble, L. G., Sarwer, D. B., Phelan, S., Cato, R. K., . . . Stunkard, A. J. (2005). Randomized Trial of Lifestyle Modification and Pharmacotherapy for Obesity. *The New England Journal of Medicine, 353*(20), 2111-2120.

Wadden, T. A., Volger, S., Sarwer, D. B., Vetter, M. L., Tsai, A. G., Berkowitz, R. I., . . . Moore, R. H. (2011). A two- year randomized trial of obesity treatment in primary care practice. *The New England Journal of Medicine, 365*(21), 1969-1979.

Wadden, T. A., Volger, S., Tsai, A. G., Sarwer, D. B., Berkowitz, R. I., Diewald, L. K., . . . Vetter, M. (2013). Managing obesity in primary care practice: an overview with perspective from the POWER-UP study. *Int J Obes (Lond), 37 Suppl 1*, S3-11. doi: 10.1038/ijo.2013.90

Wagner, E. H. (2000). The role of patient care teams in chronic disease management. *BMJ : British Medical Journal, 320*(7234), 569-572.
Waters, E., Silva-Sanigorski, A., Burford, B. J., Brown, T., Campbell, K. J., Gao, Y., . . . Summerbell, C. D. (2011). Interventions for preventing obesity in children. *Cochrane Database Syst Rev., 12*.
Whitehead, M. (1992). The concepts and principles of equity and health. *Int J Health Serv., 22*. doi: 10.2190/986l-lhq6-2vte-yrrn
Wilbert, B., Shaw, V., & Andres, A. (2011). Appetite suppressants as adjuncts for weight loss. *American Family Physician, 83*(7), 1-2.
Willaing, I., Ladelund, S., Jørgensen, T., Simonsen, T., & Nielsen, L. M. (2004). Nutritional counselling in primary health care: A randomized comparison of an intervention by general practitioner or dietician. *European Journal of Cardiovascular Prevention and Rehabilitation, 11*(6), 513-520. doi: 10.1097/00149831-200412000-00012
Wilson, D. B., Johnson, R. E., Jones, R. M., Krist, A. H., Woolf, S. H., & Flores, S. K. (2010). Patient weight counseling choices and outcomes following a primary care and community collaborative intervention. *Patient Educ Couns, 79*(3), 338-343.
Wirth, A. (2005). Reduction of body weight and co-morbidities by orlistat: The XXL - Primary health care trial. *Diabetes, Obesity and Metabolism, 7*(1), 21-27. doi: 10.1111/j.1463-1326.2004.00428.x
Woodhouse, F. Medicare, mayhem and the Vocational Register 1989 –1996. Melbourne: The Royal Australian College of General Practitioners.
Woodlief, T. L., Carnero, E. A., Standley, R. A., Distefano, G., Anthony, S. J., Dubis, G. S., . . . Goodpaster, B. H. (2015). Dose response of exercise training following roux-en-Y gastric bypass surgery: A randomized trial. *Obesity (Silver Spring), 23*(12), 2454-2461. doi: 10.1002/oby.21332
World Health Organisation. (2013). Global Action Plan for the prevention and control of noncommunicable diseases 2013-2020. Geneva: World Health Organisation.
World Health Organization. (2000). Obesity: preventing and managing the global epidemic *Report of a WHO Consultation (WHO Technical Report Series 894)*. Geneva: World Health Organization.
Yank, V., Stafford, R. S., Rosas, L. G., & Ma, J. (2013). Baseline reach and adoption characteristics in a randomized controlled trial of two weight loss interventions translated into primary care: a structured report of real-world applicability. *Contemp Clin Trials, 34*(1), 126-135. doi: 10.1016/j.cct.2012.10.007
Yanovski, S. Z. (1993). A practical approach to treatment of the obese patient. *Arch Fam Med, 2*(3), 309-316.
Yardley, L., Ware, L. J., Smith, E. R., Williams, S., Bradbury, K. J., Arden-Close, E. J., . . . Little, P. (2014). Randomised controlled feasibility trial of a web-based weight management intervention with nurse support for obese patients in primary care. *The International Journal of Behavioral Nutrition and Physical Activity Vol 11 May 2014, ArtID 67, 11*.
Young, J., Eley, D., Patterson, E., & Turner, C. (2016). A nurse-led model of chronic disease management in general practice: patients' perspectives. *Australian Family Physician, 45*, 912-916.