

Metabolic syndrome and weight management programs in primary care: a comparison of three international healthcare systems

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Abstract. Lifestyle behaviours are contributing to the increasing incidence of chronic disease across all developed countries. Australia, Canada and the UK have had different approaches to the role of primary care in the prevention and management of lifestyle-related diseases. Both obesity and metabolic syndrome have been targeted by programs to reduce individual risk for chronic disease such as type 2 diabetes. Three interventions are described – for either obesity or metabolic syndrome – that have varying levels of involvement of GPs and other primary care professionals. The structure of a healthcare system for example, financing and physical locations of primary care clinicians, shapes the development of primary care interventions. The type of clinicians involved in interventions, whether they work alone or in teams, is influenced by the primary care setting and resource availability. Australian clinicians and policymakers should take into account the healthcare system where interventions are developed when translating interventions to the Australian context.

Additional keywords: delivery of healthcare, healthy people programs, patient care management, preventive medicine, primary healthcare.

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Introduction

Primary care is the first point of health care in the Australian, Canadian and the United Kingdom (UK) systems. Owing to the strengths and efficiencies of providing services within primary care, interventions that can be used to prevent chronic disease, or better manage those already diagnosed, are being developed. This paper will discuss interventions for obesity and metabolic syndrome in three different healthcare settings. Both obesity and metabolic syndrome are risk factors for the development of chronic diseases such as type 2 diabetes. Understanding how and why interventions are developed assists translation of research findings into different healthcare settings.

Complex interventions are composed of many interacting components, affected by the actions of the providers and participants, with outcomes affected by the implementation process (Craig *et al.* 2008). Interventions that target patient behaviour, including nutrition and physical activity, are complex interventions. Where a complex intervention is designed affects both the implementation of the intervention and the expected outcomes. This has implications for the translation into other

healthcare settings where healthcare resources and infrastructure are different.

Interventions conducted in primary care settings rarely report the health system context. There are various frameworks for capturing this information, usually applied to public health and social program interventions (Pfadenhauer *et al.* 2017). The aim of this review is to contrast the local contexts of three primary care complex interventions, two for obesity and one for metabolic syndrome (Table 1), and discuss the effect of local context on intervention design and ongoing implementation.

Complex behavioural interventions

The Change Program, Australia

The Change Program is a weight management resource that has been developed for Australian general practice (Sturgiss *et al.* 2017). It was developed from evidence-based guidelines for obesity management, as well as qualitative feedback from stakeholders (Sturgiss and Douglas 2016). Relevant guidelines on nutrition, physical activity, behaviour and counselling were

What is known about the topic?

- Primary care programs that are designed to prevent chronic disease by targeting modifiable risk factors are being developed in different international healthcare systems.

What does this paper add?

- This paper compares three programs from different healthcare systems and unpacks the contextual reasons as to why they were designed in a certain way, and the potential limitations of each.

Contextual reasons for the intervention development

The National Health and Medical Research Council, Australia’s peak funding body for medical research, advocates for multidisciplinary management of obesity including referral outside the general practice environment. This endorsement of multidisciplinary management reflects the majority of obesity trials that involve care delivered by allied health or trained lay advisors with variable success (National Health and Medical Research Council 2013).

Despite this, many Australians want to work with their GP to manage their weight (Tan et al. 2006). Location, in particular rurality, cost, time pressures and preference are just a few of the reasons patients don’t work with a multidisciplinary team (Jansen et al. 2015). Access and cost are significant barriers to many allied health and specialist services, particularly for people who are also socioeconomically disadvantaged (Pearce-Brown et al. 2011). In Australia, GPs are accessible and patient satisfaction with care is high (Australian Bureau of Statistics 2016). Many patients report a strong therapeutic alliance between them and their regular GP (Sturgiss et al. 2016). In response to these factors, The Change Program was developed to ensure GPs had resources to work most effectively with

used to develop a patient workbook and guidebook for GPs. All sessions are delivered by the patient’s own GP with 2-weekly appointments in the first 3 months, followed by less frequent appointments over 2 years. An acceptability and feasibility trial for The Change Program was conducted in 2015 with positive results: the program was acceptable to patients and general practice was a feasible setting for the program (Sturgiss et al. 2017).

Table 1. A comparison of three complex behavioural interventions in international primary care settings

CHANGE, Canadian Health Advanced by Nutrition and Graded Exercise; NSW, New South Wales; ACT, Australian Capital Territory; BMI, body mass index; NA, not applicable

Location	The Change Program NSW and ACT, Australia	CHANGE program Canada	Referral to Commercial Weight Loss providers UK
Target population	Adults with obesity	Adults with metabolic syndrome (hypertension, type 2 diabetes, dyslipidaemia, large waist circumference)	Adults with a BMI ≥ 25 kg m ⁻² , this can vary for black African, African-Caribbean and Asian groups – 23 kg m ⁻² to indicate increased risk and 27.5 kg m ⁻² to indicate high risk
Type of intervention	One-on-one lifestyle behavioural intervention	One-on-one and group lifestyle behavioural intervention	Group-based behavioural intervention
Place of intervention	GP clinic	Primary Care (GP clinic or Primary Care Network building)	Referral from GP to community setting
Clinicians involved in the intervention	GP	GP, Exercise physiologist, Dietitian	GP or nurse for referral Intervention delivered by commercial weight management service
Results of trial	Feasibility trial – 1/3 patients lost >5% bodyweight at 6 months	Reversal of metabolic syndrome in 19% of participants; improvement of at least one criteria in 41% of individuals	Referral to commercial weight loss mean difference 1.43 kg, 95% CI 0.89 to 1.97; compared to advice alone
Are clinicians co-located?	NA	No	NA
Other services involved	NA	NA	Commercial or Public health-developed weight management programs. Public Health teams based in local government
Length of intervention	Two-weekly appointment for 3 months, less frequent appointments for 2 years	Weekly appointment with Exercise physiologist and Dietitian for 12 weeks, then monthly for 9 months	Weekly group sessions for 12 weeks and some areas offer additional vouchers if a person loses at least 5% of their baseline weight
Funding	Research funded by a grant; real world would be funded by Medicare with possible out-of-pocket costs to the patient	Grant funded, and partial support from primary care clinics; in real world, there would be no out-of-pocket costs to the patient	Funded by Public Health or clinical commissioning groups and free for the patient

patients who cannot, or do not, access multidisciplinary team care.

Potential limitations of this approach

Medicare, Australia's universal healthcare system, has a complex funding system requiring GPs to bill against specific item numbers that have dollar values. Visits for The Change Program lasted on average 23.6 min in the feasibility trial, and although many other health issues were addressed in addition to weight issues in these consultations (Sturgiss *et al.* 2017), this is still time intensive. Additionally, patients have frequent appointments and this can be difficult to manage around work and family commitments. Without support, including sufficient health service funding from support networks and the workplace, commitment to The Change Program can be challenging for individuals (Sturgiss *et al.* 2017). The Change Program would not be able to be implemented in healthcare settings with low GP accessibility, high patient costs or weak therapeutic alliances between the healthcare practitioner and patient (Sturgiss *et al.* 2016).

CHANGE, Canada

Canadian Health Advanced by Nutrition and Graded Exercise (CHANGE) is an interdisciplinary group who developed a program (CHANGE) to be delivered by multidisciplinary teams within primary care, taking advantage of the development of primary care teams in Canada (National Health and Medical Research Council 2013; Royall *et al.* 2014; Klein *et al.* 2017). The program is designed for adults with metabolic syndrome, and is a personalised intervention involving the dietitian, exercise physiologist and the GP. The 12-month program uses the patient's relationship with the GP while harnessing the skills of the allied health professionals. Patients meet with the allied health professional weekly for the first 3 months of the program and then monthly for 9 months. Visits with the GP occur every 3 months. CHANGE has demonstrated a reversal of metabolic syndrome in 19% of participants and improvement of at least one criteria in 41% of individuals (Jeejeebhoy *et al.* 2017).

Contextual reasons for the intervention development

In Canada, some sections of different provinces have developed multidisciplinary primary care teams. For example, in Alberta, individual family medicine offices have joined together in primary care networks (PCNs) to access funding for health professionals as well as dedicated PCN office space. These health professionals may include nurses, nurse practitioners, social workers, pharmacists, mental health workers, exercise specialists or dietitians. Currently, 40 PCNs are operating throughout Alberta and represent 90% of GPs. Every PCN is developed by GPs in co-operation with the local health region and other health professionals. These networks include both rural and urban settings and are diverse in size and available resources. Between provinces, there are variations in the allied health support available in primary care; in Alberta, Quebec and Ontario, the PCNs have the resources to support CHANGE. Patients do not pay for any of the services provided by the healthcare team.

Potential limitations of this approach

The main limitation of the Canadian CHANGE program is the availability and funding for the primary care teams. The three pilot sites in Alberta, Quebec and Ontario had the allied health practitioners available, but this is not the same in every Canadian province. Without the PCN model, the CHANGE program would be difficult to implement as the PCN acts as an integrating organisation. Additionally, in regions without financial support for dietitians and exercise physiologists, implementation is more challenging. Funding solutions, including workplace wellness, insurance company support, patient co-payment and enhanced government support are being considered to address this limitation.

Commercial weight management referral, UK

In the UK, one of the main interventions for weight management is referral to a commercial program. Aveyard *et al.* (2016a) found that a brief intervention, where weight was raised as an issue and then a referral to a commercial weight management program was offered, resulted in greater weight loss (mean difference 1.43 kg; 95% CI: 0.89–1.97) than solely raising the issue of weight. This study was important as it was part of routine care where patients were not consulting their GP about their weight, whereas other trials invite patients to take part and only the most motivated respond. The patients in the brief intervention trial are likely to be less motivated than other trial participants and they still lost ~2.5 kg at 12 months (Aveyard *et al.* 2016b). The model of care for this intervention involves the GP or patient raising weight management and then the GP offering options for referral to a commercial weight management program. This is usually for 12 weeks and free to the patient.

There are a range of commercial weight management programs that are effective, and there is little difference between the effectiveness of these programs (Madigan *et al.* 2012). Program availability varies depending on geographical area, as the program needs to be commissioned by clinical commissioning groups or public health services. The availability of these services needs to be communicated to GPs in these areas, and there are times where GPs are unaware of these programs (Booth *et al.* 2015). Additionally, there may be different eligibility criteria depending on the area, as commissioning groups may target the services for people from lower socioeconomic areas to reduce inequalities and manage limited resources.

Contextual reasons for the intervention development

There are two reasons for the development of this approach in the UK. First, there is evidence to suggest that patients will lose more weight if referred to a commercial program compared to a primary care-led program (Jolly *et al.* 2010) and second, it is more cost-effective (Jolly *et al.* 2010). Primary care in the UK is increasingly under pressure as the number of face-to-face consultations has grown by more than 15% between 2010–11 and 2014–15, compared to a smaller increase in GP workforce and a decrease in the share of the overall health budget (Baird *et al.* 2016). Thus, referring patients to a commercial weight management program is likely to be more time efficient and help relieve some pressure for managing lifestyle-related disease.

Table 2. A comparison of primary care systems in Australia, Canada and the United Kingdom
 OECD, Organisation for Economic Cooperation and Development; NHS, National Health Service; PCN, Primary Care Network

	Australia	Canada	United Kingdom
Health system	National system of universal healthcare insurance, but with split funding sources with States and Territory Governments responsible for funding Hospitals and Commonwealth Government funding primary care. Greater influence in last 10 years of private health insurance, with almost half of population having private health insurance to access care outside the public system. Ranked second overall in Commonwealth Fund comparative study of OECD health systems in 2017 (Schneider <i>et al.</i> 2017). Ranked number 1 in Health Outcomes and Administrative efficiency, but seventh on Equity, largely due to increasing out-of-pocket expenses.	Publicly funded with 13 separate provincial and territorial healthcare insurance plans to provide 'reasonable access to medically necessary hospital and physician services without paying out of pocket'. Roles and responsibilities shared between federal and provincial and territorial governments. Ranked ninth overall in Commonwealth Fund comparative study of OECD health systems in 2017 (Schneider <i>et al.</i> 2017). Ranked between sixth and 10th for Care processes, Access, Administrative efficiency, Equity and Health Outcomes.	The founding principles of the NHS were: that services should be comprehensive, universal and free at the point of delivery. Health services are paid for through tax revenue as opposed to insurance premiums. The NHS operates independently but is accountable to Government. Primary Care is one part of the NHS and accounts for ~7.9% of the annual budget (British Medical Association 2017). Ranked overall in first place in Commonwealth Fund comparative study of OECD health systems in 2017 (Schneider <i>et al.</i> 2017) and between first and third on all measures except Health Outcomes where it ranks 10th.
How is primary care funded?	Mostly fee-for-service at the GP consultation with universal government insurance (Medicare) covering costs to patient in 85% of consultations. Those consultations, which incur out-of-pocket fees above the Medicare rebate, have significant out-of-pocket fees.	Fee-for-service for the GP consultation; Exercise physiologist and Dietitian funding from federal government by PCNs.	Payment by the government for delivering services through their core GP contract and through enhances or extended service contracts agreed locally and nationally. ^A
Are patients registered with a specific general practice?	No	No (GPs are registered with PCN)	Yes
Who funds primary care?	Federal Government	Provincial Government	Funded by the Government through NHS England
Patient out-of-pocket fees	GPs can charge a gap payment on top of the Medicare schedule fee and do so in ~15% of consultations.	None (apart from some uninsured services, e.g. insurance form completion by GP).	None
Funding of allied health services	Some Medicare rebates available for patients with chronic disease; often has out-of-pocket costs for the patient.	No out-of-pocket costs to the patient if accessed through a PCN.	No out-of-pocket costs to the patient.
Is there a meso-level organisation to support and link primary care services? Do they have funds to support service delivery?	Yes, there are Primary Health Networks. They have funding and an explicit role to commission services for those in need that are not met by the market. They do not provide allied health services into practices for patients.	Yes, there is a primary care network. They do provide a limited amount of services in a distributed or centralised fashion into practices. This include Chronic disease nurses, Exercise physiologists, Dietitians, Psychologists.	Yes, there are clinical care commissioning groups that are responsible for assessing local needs and then buying services.
Are allied health and GPs co-located?	In total, 84% of practices have an onsite practice nurse; 81% have co-located pathology services; 60.3% have co-located psychologist (Britt <i>et al.</i> 2015).	In Alberta, 78% of PCNs have a dietitian and 70% have Exercise physiologists. Of these, only 20% are co-located with general practices (Klein <i>et al.</i> 2017).	All practices will have practice nurses and pathology is usually sent to the local hospital. Other services can include dietetics, but this varies and is not an essential service.
Is teamwork financially supported?	There are payments for five allied health services per year for a patient with chronic disease. There are some items for nursing work within the general practice. Case conferences are remunerated.	Financial payment can be claimed for phone calls to nursing, medical specialist; but not allied health. Family conferences are remunerated.	Work associated with 'teamwork' is not paid for separately. There are no payments on top of regular contract payments.

^AFunding general practice in England September 2017, British Medical Association, London, 2017.

Potential limitations of this approach

Most people that access commercial weight management services are women, possibly due to social norms and the historical marketing of the programs to women (Allen *et al.* 2015; Madigan *et al.* 2017). Despite this, the men that access the services tend to have better outcomes than women; however, motivation may be a factor in these findings (Madigan *et al.* 2012). Considering obesity is not dependent on gender, other services are needed to help men manage their weight.

After referral to a commercial weight management program, there is not necessarily a follow up by the GP, although individual GPs may do this. However, qualitative research examining referral to a commercial program by GPs found that ‘clinical framing’ (i.e. that the commercial program was part of clinical care and that follow up would take place) of the weight management service provided patients with a sense of importance and thus could be included to enhance intervention adherence and effectiveness (Allen *et al.* 2015).

What can be learnt from these cases

These three complex interventions highlight the influence of context on the development of primary care interventions.

Context affects the development of interventions

The local healthcare system shapes the design of complex interventions (Table 2). A research team’s concept for an intervention is influenced by the availability of allied health staff, in terms of both cost and location; for example, in Canada, CHANGE was developed to take advantage of the availability of allied health practitioners in local PCNs. In Australia, most publicly supported community allied health services are capped at five sessions annually (Pearce-Brown *et al.* 2011), so The Change Program facilitated more consultations with GPs. And in the UK, commercial weight management services are provided in some local are healthcare services. Each primary care system will have unique features that influence options for intervention development.

Similarly, primary care funding will give different options for intervention development. In Australia and Canada, primary care funding is mostly fee-for-service based on individual consultations, whereas in the UK, there is patient enrolment and GPs are paid on a contract with the National Health Service (capitation and pay for performance). It is accepted that the ongoing viability – and ability to scale interventions – is directly linked to the funding model for primary care. Furthermore, the funding system will influence intervention development in the first instance.

Translation and intervention delivery

It takes an estimated 17 years for research that improves healthcare outcomes to reach routine clinical practice (Morris *et al.* 2011). There are varied reasons for why this is the case, but the context that different interventions are developed and delivered in is a contributing factor. We have highlighted three behavioural interventions from different healthcare settings and each involves different funding models, required practitioners and ongoing infrastructure requirements. This contextual information is rarely reported, and it is up to the

reader to synthesise information from publicly available health system information. Within the limitations of publication requirements, it would be challenging to report on all of this information in an outcomes-based paper. It has been suggested that intervention development studies should be formally reported and this would provide an appropriate place for reporting contextual information (Hoddinott 2015).

For users of research information, including policymakers, there needs to be an understanding of the healthcare system where interventions are developed. This requires understanding of funding, resource and infrastructure availability. Taking the time to carefully unpack this contextual information could lead to better translation of research findings from one healthcare system to another. Understanding how context contributes to the successes of an intervention would ensure vital elements are not overlooked in the translation process.

Sustained implementation

Support for the implementation of a successful complex intervention can be fraught. Contextual factors related to funding, emergence of alternative management options and unexpected scaling up problems can all lead to the loss of interventions. The decommissioning of commercial weight loss referral options in the UK is an example of funding constraints that have destabilised an intervention program. Awareness of the contextual factors that have supported an intervention’s implementation would inform policy decisions that could threaten the sustainability of interventions in primary care.

Conclusion

Complex interventions in primary care are important for patients living with obesity and metabolic syndrome. Internationally, there are promising interventions; however, publications rarely acknowledge the effect of the local healthcare system. A solid understanding of the differences in primary healthcare systems would assist in the translation of complex interventions to other countries. Additionally, understanding the contextual factors that drive intervention development may assist in ongoing implementation of successful strategies.

Conflicts of interest

E. Sturgiss, C. D. Madigan, N. Elmitt and K. Douglas have no competing interests to declare. D. Klein is a non-paid member of Metabolic Syndrome Canada Board of Directors.

References

- Allen JT, Cohn SR, Ahern AL (2015) Experiences of a commercial weight-loss programme after primary care referral: a qualitative study. *The British Journal of General Practice* 65, e248–e255. doi:10.3399/bjgp.15X684409
- Australian Bureau of Statistics (2016) ‘Patient Experiences in Australia: Summary of Findings, 2015–16.’ (Australian Bureau of Statistics: Canberra, ACT, Australia)
- Aveyard P, Lewis A, Teame S, Hood K, Christian-Brown A, Adab P, Begh R, Jolly K, Daley A, Farley A, Lycett D, Nickless A, Yu L, Retat L, Webber L, Pimpin L, Jebb S (2016a) Screening and brief intervention for obesity in primary care: a parallel, two-arm, randomised trial. *Lancet* 388, 2492–2500. doi:10.1016/S0140-6736(16)31893-1

- Aveyard P, Lewis A, Tearne S, Hood K, Christian-Brown A, Adab P, Begh R, Jolly K, Daley A, Farley A, Lycett D, Nickless A, Yu L-M, Retat L, Webber L, Pimpin L, Jebb SA (2016b) Screening and brief intervention for obesity in primary care: a parallel, two-arm, randomised trial. *Lancet* **388**, 2492–2500. doi:10.1016/S0140-6736(16)31893-1
- Baird B, Charles A, Honeyman M, Maguire D, Das P (2016) 'Understanding Pressures in General Practice.' (The King's Fund: London, UK)
- Booth HP, Prevost AT, Gulliford MC (2015) Access to weight reduction interventions for overweight and obese patients in UK primary care: population-based cohort study. *BMJ Open* **5**, e006642. doi:10.1136/bmjopen-2014-006642
- British Medical Association (2017) Funding general practice in England September 2017. British Medical Association, London, UK.
- Britt H, Miller GC, Bayram C, Henderson J, Valenti L, Harrison C, Pan Y, Charles J, Pollack AJ, Chambers T, Gordon J, Wong C (2015) A decade of Australian general practice activity 2006–07 to 2015–16. General practice series number 41. Sydney University Press, Sydney, NSW, Australia.
- 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 (Clinical Research Ed.)* **337**, a1655.
- Hoddinott P (2015) A new era for intervention development studies. *Pilot and Feasibility Studies* **1**, 36. doi:10.1186/s40814-015-0032-0
- Jansen S, Desbrow B, Ball L (2015) Obesity management by general practitioners: the unavoidable necessity. *Australian Journal of Primary Health* **21**, 366–368. doi:10.1071/PY15018
- Jeejeebhoy K, Dhaliwal R, Heyland DK, Leung R, Day AG, Brauer P, Royall D, Tremblay A, Mutch DM, Pliamm L, Rheaume C, Klein D (2017) Family physician-led, team-based, lifestyle intervention in patients with metabolic syndrome: results of a multicentre feasibility project. *CMAJ Open* **5**, E229–E236. doi:10.9778/cmajo.20160101
- 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**, 439. doi:10.1186/1471-2458-10-439
- Klein D, Jeejeebhoy K, Tremblay A, Kallio M, Rheaume C, Humphries S, Royall D, Brauer P, Heyland D, Dhaliwal R, Mutch DM (2017) The CHANGE program: exercise intervention in primary care. *Canadian Family Physician Medecin de Famille Canadien* **63**, 546–552.
- Madigan CD, Daley A, Lewis A, Denley J, Aveyard P, Jolly K (2012) 'Which Weight Loss Programme is More Effective?' (UKSBM: Manchester, UK)
- Madigan C, Daley A, Roalfe A, Jolly K (2017) What factors influence weight loss in participants of commercial weight loss programmes? Implications for health policy. *Obesity Research & Clinical Practice* **11**, 709–717. doi:10.1016/j.orcp.2017.06.003
- Morris ZS, Wooding S, Grant J (2011) The answer is 17 years, what is the question: understanding time lags in translational research. *Journal of the Royal Society of Medicine* **104**, 510–520. doi:10.1258/jrsm.2011.110180
- 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, Vic., Australia.
- 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. doi:10.1071/PY10029
- Pfadenhauer LM, Gerhardus A, Mozygemba K, Lysdahl KB, Booth A, Hofmann B, Wahlster P, Polus S, Burns J, Brereton L, Rehfuess E (2017) Making sense of complexity in context and implementation: the Context and Implementation of Complex Interventions (CICI) framework. *Implementation Science; IS* **12**, 21. doi:10.1186/s13012-017-0552-5
- Royall D, Brauer P, Bjorklund L, O'Young O, Tremblay A, Jeejeebhoy K, Heyland D, Dhaliwal R, Klein D, Mutch DM (2014) Development of a dietary management care map for metabolic syndrome. *Canadian Journal of Dietetic Practice and Research* **75**, 132–139. doi:10.3148/cjdp-2014-005
- Schneider EC, Sarnak DO, Squires D, Shah A, Doty MM (2017) 'Mirror, The Mirror. International Comparison Reflects Flaws and Opportunities for Better US Health Care.' (The Commonwealth Fund: Washington, DC, USA)
- Sturgiss EA, Douglas K (2016) 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* **2**, 20. doi:10.1186/s40814-016-0060-4
- Sturgiss EA, Sargent GM, Haesler E, Rieger E, Douglas K (2016) Therapeutic alliance and obesity management in primary care – a cross-sectional pilot using the Working Alliance Inventory. *Clinical Obesity* **6**, 376–379. doi:10.1111/cob.12167
- Sturgiss EA, Elmitt N, Haesler E, van Weel C, Douglas K (2017) Feasibility and acceptability of a physician-delivered weight management programme. *Family Practice* **34**, 43–48. doi:10.1093/fampra/cmw105
- Tan D, Zwar NA, Dennis SM, Vagholkar S (2006) Weight management in general practice: what do patients want? *The Medical Journal of Australia* **185**, 73–75.