

Appetite for life: an evaluation of a primary care lifestyle programme

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ABSTRACT

INTRODUCTION: Appetite for Life is a six-week primary care-based programme for women who are overweight, and aims to achieve long-term health gain through establishing healthy eating and physical activity patterns and a healthier weight.

AIM: To evaluate the outcomes of Appetite for Life, a primary care-based healthy lifestyle programme for women who are overweight.

METHODS: Two hundred and sixty-one women enrolled and consented to take part in the six-week Appetite for Life programme via general practice and were followed for 12 months. Eating behaviours and physical activity levels were measured at baseline, six weeks, six months and 12 months. Anthropometric and biomedical data was collected at visits to the participants' general practitioners at baseline and 12 months.

RESULTS: Positive lifestyle changes were reported that were sustained for the duration of the 12-month follow-up period. Participants reported an increase in intake of fruit and vegetables, dairy products, healthy fats and an increased level of physical activity. There was also an increase in reported enjoyment and participation in exercise. Mean weight was maintained over this time period. There was a reduction in mean LDL and total plasma cholesterol.

DISCUSSION: A healthy lifestyle programme offered through primary care that is based on a non-dieting approach may help overweight women develop and sustain positive lifestyle changes.

KEYWORDS: Health promotion; health status; obesity; weight loss, physical activity

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Introduction

Rising rates of obesity, poor nutrition and inactivity contribute significantly to the burden of disease in New Zealand and are a substantial cost to the health system.^{1,2} A comprehensive approach is needed to address these problems; one that includes both population strategies as well as individual-level strategies that effect long-term lifestyle change.^{3,4}

This paper reports the outcome evaluation of Appetite for Life, an established primary care-based healthy lifestyle programme. This programme aims to help women who are overweight to achieve long-term health gain through establishing

healthy eating and physical activity patterns and ultimately a healthier weight. Lifestyle changes, in particular increasing physical activity levels, can lead to improvement in health status in overweight adults, whether or not weight loss occurs.⁵⁻⁷

Appetite for Life was developed by public health nutritionists at Community and Public Health (Canterbury District Health Board) following requests from general practice nurses for an effective healthy lifestyle programme that could be delivered in the primary care setting. The programme was developed for women because of the key role women play in the planning and preparation of food for their families.

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The Appetite for Life programme was modelled on a non-dieting approach. A non-dieting approach emphasises the importance of achieving sustainable, positive lifestyle changes rather than dietary restriction.^{8,9} Although there are variations, the non-dieting approach includes professional and social support as well as educational, behavioural and psychological strategies and are usually delivered in a group setting.^{8,10-13} A dieting approach (kilojoule restriction) was avoided as, although it may be effective in the short-term, weight loss is infrequently maintained in the long-term^{4,14} and may have harmful effects such as a weight-cycling, preoccupation with food and poor self-esteem.^{8,15}

The design of Appetite for Life is based on contemporary behavioural research and theoretical models of how adults learn and how learning in-

The aim of this evaluation was to determine the outcomes of the Appetite for Life programme in a real-world situation in primary care.²⁰

Methods

Appetite for Life was delivered by trained practice nurse facilitators to groups of women (12–15) through six two-hour group sessions over a six-week period. This was delivered through information provision and experiential learning demonstration and food tastings in a group setting that allowed the development of social support and self-efficacy.

Participants were encouraged to follow the *New Zealand Food and Nutrition Guideline Statements for Healthy Adults*.²¹ This included encouragement to eat a variety of nutritious foods from

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fluences their health behaviour. Social Cognitive Theory,¹⁶ the Health Belief Model¹⁷ and Communication Theory¹⁸ guided programme strategies to emphasise social support, reinforcement, attitude development and self-efficacy. Social Cognitive Theory suggests that environmental role models and societal expectations can significantly influence health behaviour. The programme used several techniques derived from this theory including self-efficacy, role modelling, skills training and observational learning.

The wide population coverage of primary health care (over 95% of people in the region are enrolled) provides an opportunity for widespread dissemination of interventions. This programme aimed to address barriers to diffusion of innovations¹⁹ by highlighting the programme's simplicity and compatibility with existing practices and resources.

each of the four major food groups each day, to eat plenty of vegetables and fruits, to eat plenty of breads and cereals, preferably wholegrain, to include milk and milk products in their diet (preferably reduced or low-fat) and decrease or maintain a low intake of dietary fat. Participants were also encouraged to maintain or increase physical activity levels by doing 'as much as they can, as often as they can, going as hard as they can, for as long as they can.' Participants were not given advice about kilojoule restriction and were discouraged from monitoring weight changes. Instead, they were encouraged to develop new habits by working through a series of behavioural goals.

The Appetite for Life programme session included:

- **Session 1:** Food, why do we need it; the importance of breakfast (food tasting) and why diets (per se) don't work

- **Session 2:** Reducing fat; healthy breads and spreads (food tasting) and identifying what we eat
- **Session 3:** Increasing fibre; healthy desserts (food tasting) and changing eating habits
- **Session 4:** Becoming more physically active; smarter snacking (food tasting) and reading food labels
- **Session 5:** Recipe modification; eating more legumes (food tasting) and what fat loss we can expect
- **Session 6:** Nutrients women need; body image; potluck dinner (food tasting) and ongoing management and sustainability.

Participants in the programme were supported by the practice nurse facilitators to develop positive lifestyle changes at an individual and family level through problem solving, skill development and improved self-efficacy. Following the initial six-week course, participants were supported by their practice nurses and received quarterly newsletters.

The practice nurse facilitators participated in the Appetite for Life course programme prior to receiving training from the Appetite for Life trainer (public health nutritionists and adult education experts) in adult learning and group facilitation. The trainer also supported the practice nurses in the delivery of their first course.

Appetite for Life was offered in and publicised through general practices, a newspaper advertisement and word of mouth, and was offered in South Canterbury, West Coast and Canterbury. The programme was promoted to women who were overweight. There were no exclusion criteria. Those who participated between 2006 and 2007 were invited to participate in the evaluation (279).

The evaluation was commenced prior to the National Ethics Advisory Committee's guideline development. Ethics approval was not formally sought for this evaluation as it was considered to be an audit of existing practice. Informed written consent was obtained from the participants. As the programme was primary care-based, participants' National Health Index numbers were used as their unique identifiers to allow data anonymity.

WHAT GAP THIS FILLS

What we already know: A non-dieting approach is an alternative to dieting and can lead to sustained positive lifestyles changes.

What this study adds: A healthy lifestyle programme that takes a non-dieting approach may be effective in making sustained positive lifestyles changes for participants outside the trial setting in primary care.

The participants were followed up over a 12-month period. The key outcomes were eating behaviours, physical activity levels, and weight. A questionnaire on eating behaviours and physical activity patterns was conducted at baseline, completion of the programme, six months and 12 months.

The questionnaire section on eating behaviours was adapted from one used for similar programmes in Australia. The questionnaire measured self-reported dietary intake of different food types, including breads and cereals, fruit and vegetables, dairy products (low and high fat) and dietary fat. The questionnaire also recorded attitudes towards eating and dieting, the impact of healthy eating on the participant's family and enjoyment of, and ability to, exercise. Intake of different food groups was calculated as an index score based on responses from the questionnaire. This score represents healthier eating behaviours aligned with nutritional intake recommended by the Ministry of Health.²² The short version of the International Physical Activity Questionnaire was used to measure physical activity.^{23,24}

Follow-up questionnaires were mailed to participants and returned using a postage-paid envelope. At 12 months a reminder was sent to participants to visit their primary health care practice for clinical measurements and a blood sample.

Anthropometric and biomedical data was collected at visits to the participants' general practitioners at baseline and 12 months. The information included demographic details, weight, height, waist circumference, total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides, fasting blood glucose (for participants without known diabetes) or glycated haemoglobin (for participants with known diabetes) and HbA1c.

Participant addresses were geocoded to residential address points using the Critchlow Ltd Geostan geocoding engine. Using ESRI ArcGIS Desktop 9.3, addresses were assigned and aggregated within 2006 census meshblocks. Each geocoded point was assigned the New Zealand Deprivation Index 2006 (NZDep2006) decile of its corresponding meshblock.²⁵

Statistical analyses were conducted using SPSS (version 14.0). Biomedical and psychosocial data were analysed using paired samples *t*-tests and chi-squared comparing baseline and 12-month data. To assess whether there was any difference in results between the three different regions where programmes were run one-way, ANOVA tests were performed using data relating to changes in fruit and vegetable consumption.

Results

Response rates

Two hundred and seventy-nine women enrolled in the Appetite for Life programme over the evalu-

ation period (2006–2007). Eighteen women who enrolled did not provide baseline data. Baseline data was collected from 261 women. Follow-up data was collected from 212 (81.2%) on completion of the programme, 186 (71.3%) at six months and 149 (57.1%) at 12 months. There was no significant difference in baseline measures between those who completed the follow-up surveys and those who did not, with the exception that those who completed the surveys had a higher reported cereal intake than non-completers (4.5 vs 4.1, $p<0.005$). The retention rates in the programme were not systematically recorded, but were reported to be high.

Demographics

Over half the enrolled participants were from the West Coast (144, 51.6%), with 62 participants (22.2%) in Canterbury and 73 in South Canterbury (26.2%). The median age was 48, with 9.7% of the evaluation sample identifying as Maori, 0.4% as Pacific and the remainder either as New Zealand European or New Zealander. Of the 261 participants, 202 (77%) had residential address data of sufficient detail recorded to allow geocoding. For those coded, the sample was skewed toward greater deprivation, with 51% from NZDep2006 quintiles 4 and 5.

Nutrition and physical activity surveys results

From baseline to 12 months there was an increase in the level of agreement that 'exercise is enjoyable' ($t=-2.8$ df=136 $p<0.01$) and that 'exercise is convenient' ($t=-3.7$ df=124 $p<0.01$). There was a significant increase in the number of minutes spent walking daily from 17.5 minutes at baseline to 24.6 minutes at 12 months ($t=-2.86$ df=86 $p<0.01$).

There was strong agreement with the statement 'eating a healthy diet could fit in with the rest of the family or the people I live with' at baseline and this agreement was sustained after 12 months ($t=0.08$ df=136 $p=0.9$). There was a statistically significant decrease between baseline and programme completion (at six weeks) agreeing that diets are effective ($t=-2.2$ df=191 $p<0.01$), but this difference was not maintained at either six months ($t=-1.6$ df=160 $p=0.1$) or 12 months ($t=-0.06$ df=135 $p=1$).

Table 1. Reported consumption of key food groups

Food group	Time-point	n	Index score*	Range of scores	p-value
Breads and cereals	Baseline	261	4.3	1–8	
	Post-programme	206	5.2		<0.01
	6 months	178	4.8		<0.01
	12 months	144	4.7		0.11
Fruit and vegetables	Baseline		7.7	1–10	
	Post-programme	206	8.6		<0.01
	6 months	177	8.5		<0.01
	12 months	144	8.3		<0.01
Milk and milk products	Baseline		3.3	1–5	
	Post-programme	208	3.6		<0.01
	6 months	179	3.6		<0.01
	12 months	145	3.6		<0.01
Dietary fat	Baseline		3.3	1–5	
	Post-programme	208	3.7		<0.01
	6 months	179	3.6		<0.01
	12 months	145	3.6		<0.01

* Higher score represents healthier food consumption pattern

Table 2. Anthropometric and biomedical indicators

Measurement	n	Baseline	12 months	Significance (p-value)
Weight (kg)	139	91.7	91.0	0.09
Waist circumference (cm)	132	102.9	102.1	0.19
Triglycerides (mmol/L)	125	1.46	1.44	0.68
Total cholesterol (mmol/L)	126	5.42	5.2	<0.01
LDL cholesterol (mmol/L)	125	3.32	3.09	<0.01
HDL cholesterol (mmol/L)	124	1.47	1.51	0.06

Bread and cereal consumption increased following the programme and at six months; however this behavioural change had diminished by 12-month follow-up (Table 1). Fruit and vegetable consumption was reported to be above recommended levels at baseline. This intake significantly increased during the programme and the dietary improvement was maintained to 12 months. The consumption of milk products and healthy fats increased following the programme and through to 12-months' follow-up.

Anthropometric and biomedical results

There was no significant change in weight or waist circumference over the 12-month period. (Table 2) While there was no change in triglycerides ($p=0.68$), both total cholesterol ($p<0.01$) and low density lipoprotein (LDL) cholesterol fell significantly over the 12 months.

Discussion

The aim of this evaluation was to measure the outcomes of Appetite for Life, a primary care-based group healthy lifestyle programme for women who are overweight. Positive lifestyle changes for most parameters that were sustained for the duration of the 12-month evaluation period were reported. Participants reported an increase in intake of fruit and vegetables, dairy products, healthy fat intake and an increased level of physical activity. There was also an increase in reported enjoyment and convenience in exercise. There was a reduction in mean LDL and total plasma cholesterol. Mean weight did not change over this time period.

The results of this evaluation are in line with those of randomised controlled trials of similar

non-dieting interventions. There is some variation in the design of the interventions studied, but all have had an emphasis on lifestyle change rather than dieting and have had small sample sizes.

The most consistent findings in these trials are improved psychological outcomes,^{26–30} reduction in risk factors for chronic disease,^{13,28,31} and increased levels of physical activity.^{13,27,30} The trials had mixed results for weight loss, with interventions resulting in either weight maintenance^{13,27,28,32,33} or modest weight loss.^{12,26,30} Given that the natural history of weight in obese adults is that weight increases steadily over time, the maintenance of weight over a one-year period may be viewed as a positive outcome.³⁴ Drop-out rates for the intervention groups by the end of the intervention ranged from eight to 24%.^{12,27,30–33} Drop-out rates for the Appetite for Life programme were not formally recorded, but were reported by the practice nurse facilitators to be low.

This evaluation's main strength is that it is a practice-based evaluation and therefore the positive results are more likely to be replicable in other practice setting than the results from controlled trials. Given the poor translation of interventions from efficacy trials to effectiveness outcomes, this study seeks to evaluate the effectiveness of a real-world intervention.^{20,35}

There are several limitations in this evaluation. With no control group, comparisons cannot be made directly to alternative interventions such as a dieting approach or no intervention. This design means selection bias cannot be assessed; it is possible participants were already motivated to alter their diet and physical activity. The survey follow-up rate at 12 months was low at

57%. This could well lead to an over-emphasis of the positive outcomes, as those that completed follow-up may be more likely to have had positive outcomes. Obtaining accurate self-reporting on food and fluid on nutritional intake is notoriously difficult and therefore the results of the survey instrument may not be reliable.^{36,37} This was accentuated by having no control group. Unfortunately retention rates in the six-week practice nurse-led programme were not recorded.

The main implication of this evaluation is that a healthy lifestyle programme can be successfully implemented in a New Zealand primary care setting. In addition to the evaluation reported here, interviews with the participating practice nurse facilitators were conducted. They reported high levels of satisfaction with the programme which has been accepted and adopted by primary health care in the region. Other benefits that the

Although the findings from this evaluation indicate positive outcomes, they are insufficient to claim outright that Appetite for Life is effective. Stronger research designs are required. Further research on the non-dieting approach should include the impact of this type of intervention on the lifestyle of other family and household members. The change in lifestyle of the participants is likely to influence other household members through changes in purchasing and preparation of food for the family. This is particularly important to explore because of its potential influence on childhood obesity.

A non-dieting healthy lifestyle programme in New Zealand primary care settings appears promising for achieving sustainable lifestyle changes for women who are overweight. These sustained changes are likely to lead to positive health benefits regardless of whether weight loss occurs.

Facilitators identified food tastings, the practical advice, effective group dynamics, locally-based delivery and support from nutritionists as factors key to the programme's success

practice nurse facilitators reported were increased nutrition knowledge, confidence in assisting overweight clients and skills in motivating clients for behavioural change. Facilitators identified food tastings, the practical advice, effective group dynamics, locally-based delivery and support from nutritionists as factors key to the programme's success.

The findings of this evaluation will help to further refine and develop Appetite for Life to improve its success. Future developments will look to strengthen elements that are known to increase success in weight loss. As the non-dieting approach has not developed a strong evidence base to date, the success factors for a non-dieting approach have not been reviewed. It is important that success factors from other similar types of interventions are incorporated into successive programme development.

References

1. Ministry of Health. A portrait of health. Key results of the 2006/07 New Zealand health survey. Wellington: Ministry of Health; 2008.
2. Ministry of Health, The University of Auckland. Nutrition and the burden of disease: New Zealand 1997–2011. Wellington: Ministry of Health; 2003.
3. Swinburn B, Egger G. Preventive strategies against weight gain and obesity. *Obes Rev*. 2002;3(4):289–301.
4. Mulvihill C, Quigley R. The management of obesity and overweight: an analysis of reviews of diet, physical activity and behavioural approaches: evidence briefing. 1st edition. NHS: Health Development Agency; 2003.
5. Warburton DE, Nicol CW, Bredin SS. Health benefits of physical activity: the evidence. *Can Med Assoc J*. 2006;174(6):801–9.
6. World Health Organization. Diet, nutrition and the prevention of chronic diseases. Geneva: WHO; 2003.
7. Shaw K, Gennat H, O'Rourke P, Del Mar C. Exercise for overweight or obesity. *Cochrane Database Syst Rev*. 2006(4):CD003817.
8. Foreyt J, Goodrick GK. Weight management without dieting. *Nutrition Today*. 1993;24(2):4–9.
9. Polivy J, Herman C. Undieting: a program to help people stop dieting. *Int J Eat Disord*. 1992;11(3):261–268.
10. National Health and Medical Research Council. Clinical practice guidelines for the management of overweight and obesity in adults. Canberra: National Health and Medical Research Council; 2003.
11. Ikeda J, Amy NK, Ernsberger P, Gaesser GA, Berg FM, Clark CA, et al. The National Weight Control Registry: a critique. *J Nutr Educ Behav*. 2005;37(4):203–5.
12. Provencher V, Begin C, Tremblay A, Mongeau L, Boivin S, Lemieux S. Short-term effects of a 'health-at-every-size' approach on eating behaviors and appetite ratings. *Obesity (Silver Spring)* 2007;15(4):957–66.
13. Bacon L, Stern JS, Van Loan MD, Keim NL. Size acceptance and intuitive eating improve health for obese, female chronic dieters. *J Am Diet Assoc*. 2005;105(6):929–36.

14. Anderson JW, Konz EC, Frederich RC, Wood CL. Long-term weight-loss maintenance: a meta-analysis of US studies. *Am J Clin Nutr*. 2001;74(5):579–84.
15. Polivy J. Psychological consequences of food restriction. *J Am Diet Assoc*. 1996;96(6):589–92; quiz 593–4.
16. Bandura A. A social learning theory. Englewood Cliffs, NJ: Prentice Hall Inc.; 1977.
17. Janz NK, Becker MH. The health belief model: a decade later. *Health Educ Q*. 1984;11(1):1–47.
18. U.S. Department of Health and Human Services. Making Health Communications Work. Bethesda, Maryland: National Institutes of Health; 1992.
19. Rogers EM. Diffusion of innovations. New York: Free Press; 1995.
20. Garfield SA, Malozowski S, Chin MH, Narayan KM, Glasgow RE, Green LW, et al. Considerations for diabetes translational research in real-world settings. *Diabetes Care*. 2003;26(9):2670–4.
21. Ministry of Health. New Zealand Food and Nutrition guideline statements for healthy adults. 2007 August 5 [cited 10 July 2010]. Available from: <http://www.moh.govt.nz/moh.nsf/indexmh/nutrition-foodandnutritionguidelinestatement>
22. Ministry of Health. Food and nutrition guidelines for healthy adults: a background paper. Wellington: Ministry of Health; 2003.
23. Craig CL, Marshall AL, Sjostrom M, Bauman AE, Booth ML, Ainsworth BE, et al. International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc*. 2003;35(8):1381–95.
24. Brown W, Bauman A, Chey T, Trost S, Mummery K. Comparison of surveys used to measure physical activity used in Australia and New Zealand. *Aust N Z J Public Health*. 2004;28:128–34.
25. White P, Gunston J, Salmond C, Atkinson J, Crampton P. Atlas of socioeconomic deprivation in New Zealand NZDep2006. Wellington: Public Health Intelligence, Ministry of Health; 2008.
26. 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(9–10):148–54.
27. Tanco S, Linden W, Earle T. Well-being and morbid obesity in women: a controlled therapy evaluation. *Int J Eat Disord*. 1998;23(3):325–39.
28. Carroll S, Borkoles E, Polman R. Short-term effects of a non-dieting lifestyle intervention program on weight management, fitness, metabolic risk, and psychological well-being in obese premenopausal females with the metabolic syndrome. *Appl Physiol Nutr Metab*. 2007;32(1):125–42.
29. Crerand CE, Wadden TA, Foster GD, Sarwer DB, Paster LM, Berkowitz RI. Changes in obesity-related attitudes in women seeking weight reduction. *Obesity (Silver Spring)*. 2007;15(3):740–7.
30. Rapoport L, Clark M, Wardle J. Evaluation of a modified cognitive-behavioural programme for weight management. *Int J Obes Relat Metab Disord*. 2000;24(12):1726–37.
31. Bacon L, Keim NL, Van Loan MD, Derricote M, Gale B, Kazaks A, et al. Evaluating a 'non-diet' wellness intervention for improvement of metabolic fitness, psychological well-being and eating and activity behaviors. *Int J Obes Relat Metab Disord*. 2002;26(6):854–65.
32. Hawley G, Horwath C, Gray A, Bradshaw A, Katzer L, Joyce J, et al. Sustainability of health and lifestyle improvements following a non-dieting randomised trial in overweight women. *Prev Med*. 2008;47(6):593–9.
33. Katzer L, Bradshaw AJ, Horwath CC, Gray AR, O'Brien S, Joyce J. Evaluation of a 'nondieting' stress reduction program for overweight women: a randomized trial. *Am J Health Promot*. 2008;22(4):264–74.
34. Harvie MN, Bokhari S, Shenton A, Ashcroft L, Evans G, Swindell R, et al. Adult weight gain and central obesity in women with and without a family history of breast cancer: a case control study. *Fam Cancer*. 2007;6(3):287–94.
35. Glasgow RE, Lichtenstein E, Marcus AC. Why don't we see more translation of health promotion research to practice? Rethinking the efficacy-to-effectiveness transition. *Am J Public Health*. 2003;93(8):1261–7.
36. Vance VA, Woodruff SJ, McCargar LJ, Husted J, Hanning RM. Self-reported dietary energy intake of normal weight, overweight and obese adolescents. *Public Health Nutr*. 2009;12(2):222–7.
37. Cook A, Pryer J, Shetty P. The problem of accuracy in dietary surveys. Analysis of the over 65 UK National Diet and Nutrition Survey. *J Epidemiol Community Health*. 2000;54(8):611–6.

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COMPETING INTERESTS

None declared.