

The Green Prescription Active Families programme in Taranaki, New Zealand 2007–2009: Did it reach children in need?

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ABSTRACT

INTRODUCTION: The Green Prescription Active Families (GRxAF) programme focuses on overweight/obese children and adolescents, and is family/whānau based. It is an intervention supporting lifestyle changes through weekly sessions (nutrition advice and/or physical activity), and goal setting for the family/whānau for up to 12 months.

AIMS: To describe the GRxAF programme in Taranaki and evaluate its reach and engagement, especially for those most at risk of obesity.

METHODS: Participant files for each referred child from May 2007 to December 2009 were reviewed. Baseline demographic data, programme graduation information, and weekly activity session attendance were collected.

RESULTS: Of the 109 participants during the audit period, 39% were Māori, 57% New Zealand European (NZE), 3% Pacific, and 1% Other ethnicity. Mean age at entry was 10 (range 4–17) years. Mean duration of programme involvement was five (range 0–12) months. Overall, 33/60 (55%) of the participants completing the programme during the audit period graduated, having made steps towards healthy lifestyle change. In comparison with NZE (68%), a smaller proportion of Māori (40%) graduated ($p=0.04$). In comparison with those who attended no sessions, participants who attended any sessions were more likely to make positive changes (OR=3.65, 95% CI 1.24–10.8).

DISCUSSION: GRxAF in Taranaki met a need for some obese/overweight children, but not for all families/whānau, especially those over-represented in childhood obesity statistics. Programme delivery for Māori requires improvement, and assessment of readiness to make lifestyle change as an enrolment criteria for all participants is recommended.

KEYWORDS: Adolescent; child; nutrition; obesity; physical activity; treatment

Introduction

Obesity in children and adolescents is a priority health issue in New Zealand. In the past two years, both the Office of the Auditor General¹ and the New Zealand Medical Association² have released reports outlining comprehensive strategies to address obesity. The Health of New Zealand Children 2012/2013 survey showed 11% of children aged 5–14 years are obese—a significant increase from 2006/2007 (8.4%).³ Obesity prevalence is higher for Māori (19%) and Pacific ethnic-

ity (27%), and children living in more deprived areas (20%).³ Based on data from 2006, overweight and obesity are estimated to contribute annual costs of NZ\$720 to 850 million in health care and lost productivity for New Zealand.⁴

A 2004 stocktake of child and adolescent obesity intervention and prevention programmes by the Ministry of Health showed no national cohesive approach. The stocktake identified a variety of screening programmes, family-based programmes, Train the Trainer programmes, and, in three

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district health boards (DHBs), the Green Prescription Active Families (GRxAF) programme.⁵ Prevention programmes such as the school-based programme Project Energize in Waikato were emerging. Strategies to implement the Ministry of Health's Healthy Eating Healthy Action policy were in place in some DHBs; 240 walking school buses were active around the country, and almost all areas had 'Health Promoting Schools'. Only three DHBs (of the 21 nationally) had initiatives targeting socioeconomically disadvantaged communities (Taranaki was not one of these), and only five DHBs were offering multidisciplinary intervention programmes.⁵ Recognition of obesity in preschoolers did not occur in a comprehensive fashion until the rollout of B4 School Checks nationally in September 2008.⁶

The GRxAF programme evolved in part to provide a nationally consistent approach to tackling childhood obesity. The aim of the GRxAF programme is: 'to support, educate and encourage families to set goals for lifestyle change and physical activity levels in children and young people' (p.3).⁷ The programme attempts to target healthy lifestyle change at a community level, addressing both physical activity and nutrition through advice. A Green Prescription is a health professional's written advice to an adult patient to be physically active as part of their overall health management, and was initially launched in New Zealand by the Hillary Commission in 1997.⁷ The Green Prescription Active Families (GRxAF) initiative was introduced by Sport and Recreation New Zealand (SPARC) in 2004, and gradually implemented throughout most of the country in conjunction with regional sports trusts and health organisations. Management of the Green Prescription initiative, including the GRxAF, transferred from SPARC to the Ministry of Health in 2009.⁷

Referrals for GRxAF are received by health professionals and actioned by a GRxAF coordinator. Children aged 5–18 years old are eligible. GRxAF is designed to address childhood obesity and other health problems by providing physical activity and nutritional advice, education, encouragement, goal setting and community-based activities.⁷ Families need to be committed to change, although such commitment is not formally assessed.⁷ Importantly, priority groups

WHAT GAP THIS FILLS

What we already know: Childhood obesity is prevalent in New Zealand. There is a paucity of intervention programmes addressing childhood obesity, with minimal coordination of such programmes nationally.

What this study adds: The Green Prescription Active Families programme is the most widespread and intensive intervention programme nationally (although still not nationwide), and this Taranaki audit shows it is capable of achieving healthy lifestyle change in children and their whānau. However, further refinement is required to improve engagement and reach of the programme; in particular, by increasing accessibility to population groups most affected by childhood obesity.

based on ethnicity or socioeconomic status were not part of key performance indicators (KPIs) set originally by SPARC (and then the Ministry of Health) for GRxAF contract holders, although ethnicity and address were expected to be collected.⁷ Weight changes in individuals were also not set as a priority measure, with changes in body mass index (BMI) not included as part of expected KPIs.⁷

With regard to a national approach to tackling childhood and adolescent obesity, Ministry of Health guidelines were released in 2009, supporting a multidisciplinary approach, working with family/whānau to address food habits, activity and behaviour (the 'FAB' approach).⁸ This approach is deemed most likely to have success.^{9,10} A priority of the Ministry of Health guidelines was the improvement of outcomes with regard to weight management for Māori, Pacific and South Asian populations.⁸ The 2010 Ministry of Health implementation plan for the clinical guidelines included guidance aimed at attaining consistency across regions. It acknowledged the lack of a coordinated service for obese children nationally.¹¹

At the 2013 census, there were 23 139 children in Taranaki aged 0–15 years; 6441 children were of Māori ethnicity (28%), and only 756 of Pacific ethnicity (3%).¹² A conservative estimate from existing data was that there would be approximately 2500 obese children in Taranaki, of whom approximately 50% would be Māori (n=1224).³ As part of the development of a child and adolescent obesity service for Taranaki, an evaluation was completed of the current intervention

Table 1. Number of children who graduated or were discharged, by ethnicity

Ethnicity	Number graduated (%)	Number discharged (%)	No contact	Active	Number referred (%)
NZ European	21 (68)	10 (32)	6	26	63 (58)
Māori	10 (40)	15 (60)	5	12	42 (39)
Pacific	2 (67)	1 (33)	0	0	3 (3)
Other	0 (0)	1(100)	0	0	1 (1)
Total	33 (55)	27 (45)	11	38	109

programmes in the region, of which the GRxAF programme was the most established. The objectives of the audit reported here aimed:

1. to describe the GRxAF programme as it was run in Taranaki during the study period; and
2. to evaluate engagement and reach of the GRxAF programme, especially for those most at risk of child and adolescent obesity.

Given the low numbers of Pacific children and adolescents within Taranaki, the focus of this audit was engagement with Māori.

Methods

Our audit included all children who participated in the GRxAF Taranaki from the programme's inception on 1 May 2007 to 18 December 2009. For each child the following data were collected: gender, age, ethnicity, reason(s) for referral, referrer, date referred/started/finished, underlying medical conditions, graduation/discharge from programme, number of home visits, attendance at weekly activity sessions and frequency. Weight and height were not routinely measured and were not recorded at programme completion, as weight loss was not deemed the primary focus of the GRxAF Taranaki programme. As this was an internal audit, no ethical consent was required. Participant confidentiality was maintained throughout.

In 2009, the GRxAF Taranaki programme involved an initial home visit from the coordinator, provision of a workbook with individualised goals/targets and follow-up, and advice on physical activity and nutrition. Follow-up meetings or phone calls were provided depending on the family's needs. Weekly activity sessions at various sports venues in New Plymouth were provided for up to 12 months. The GRxAF programme

was accessible to New Plymouth District residents only (total n=74 757 which comprises 68% of the total population of the Taranaki region).¹²

Participants in the GRxAF programme completed the programme by either 'graduating' or being 'discharged'. Graduation was defined as the family and child attaining success in making healthy lifestyle change (increasing their physical activity and improving nutritional habits—both parent and self-report only), and was ultimately determined subjectively by the GRxAF coordinator. If the family or the child referred lost interest in the programme or declined further guidance, they were discharged from the programme.

Results

Demographic information

A total of 109 participants were referred and accepted into the GRxAF Taranaki programme from 2007 to 2009. The number of participants/families involved increased annually; 16 in 2007, 41 in 2008, and 52 in 2009. Mean age at programme entry was 10 years (range 4–17 years, n=105). The wide age range was due to the whānau (family) based inclusive approach, encouraging siblings and extended family to participate. Enrolment age range was consistent with the GRxAF target age range of 5–18 years when compared with the 2009 national survey (n=102 participants nationally, mean age not supplied).¹³

Participants' ethnic affiliations were: Māori 39% (n=42), New Zealand European (NZE) 58% (n=63), Pacific 3% (n=3), and Other ethnicity 1% (n=1) (Table 1). In comparison, the 2009 national survey reported participant ethnicity as Māori 36%, NZE 67%, Pacific 17%, and Asian 2% (more than one ethnic group in this survey was reported in some cases).¹³

Referral details

Reason for referral was provided for 104 of the 109 participants referred. The most common reason for referral was 'weight concerns' for the child (80%). The 2009 GRxAF report cited 'weight problems' as the reason for referral in 85% of children (referred July 2008 to June 2009).¹³ Referrals came from dietitians (41%), family self-referrals (24%), paediatricians (14%), general practitioners (11%), public health nurses (9%), and public health organisation coordinators (1%). This diversity of referral source was in contrast with national data, where 61% were either referred by a general practitioner (43%) or a paediatrician (18%).¹³

Success in the programme

As of 18 December 2009, of the 109 participants, 35 were still in the programme, 3 were in the process of starting the programme (total 38 Active participants in the programme), and 11 had been lost to follow-up. Therefore, further analysis was only possible in 60 participants (Table 1). Successful graduation from the programme was achieved by 33 of these 60 (55%), with the remaining 27 (45%) discharged from the programme. In comparison with NZE (68%), a smaller proportion of Māori (40%) graduated ($p=0.04$).

An association was evident between session attendance and likelihood of graduation, with attendance at any activity sessions associated with an increased likelihood of graduating (odds ratio [OR] 3.65, 95% confidence interval [CI] 1.24–10.8; Table 2).

Home visits and duration in programme

The total number of home visits within the programme from inception was 288. The 2009 GRxAF national survey contained no home visit

information for comparison. Consistent with the relationship observed with session attendance, in comparison with the children who were discharged, children who graduated received more home visits (Table 3). The median duration of completed participants' engagement with the programme was five months (range 0–12 months). Previous evaluations of the GRxAF programme have suggested that a six-month intervention may be insufficient to achieve lifestyle changes resulting in a significant reduction in BMI.¹⁴

Discussion

Our audit of GRxAF in Taranaki showed that the programme was run similarly to GRxAF programmes nationwide. However, it was successful in achieving healthy lifestyle changes in only 55% (those who graduated) of those who participated in the programme (those graduated or discharged). The programme was not uniformly successful across the community, and reached <5% (109/2500) of the region's obese childhood population. Of particular note, a lower proportion of participants that were Māori compared with NZE graduated.

The lower success rate for Māori in part reflects issues with the programme's implementation. The per annum cost of GRxAF in Taranaki during the audit period was \$61,000. Funding restrictions limited the provision of GRxAF to some of the most deprived areas of Taranaki, with only 68% of the eligible population within Taranaki able to access the programme. If the programme was more accessible for Māori, one would expect greater involvement, given that approximately half of obese children in Taranaki are Māori. For programmes such as GRxAF to improve population health, they need to be accessible to all. Recent successes achieved with other national

Table 2. Number of graduations and discharges by weekly activity attendance ($n=60$)

Attendance at weekly sessions	Number graduated (%)	Number discharged (%)	Odds ratio (95% CI)
Either often or not often*	20 (33)	8 (13)	3.65 (1.24–10.8)
Never attended	13 (22)	19 (32)	1.00 (Reference)
Total	33 (55)	27 (45)	

* Attending 'often' was defined as the participant attending $\geq 50\%$ of the weekly activity sessions while they were in the programme; 'not often' was defined as attending <50% of sessions

Table 3. Home visits and duration in programme for those participants who completed the programme (n=71)

Outcome	Mean number of home visits (range)	Mean number of months in programme (range)
Graduation	6 (1–12)	8 (1–13)
Discharge	3 (1–8)	3 (1–7)
Unable to contact	0 (0)	1 (0–3)
Total	5 (0–12)	6 (1–13)

health initiatives, for example immunisation, highlight the need for inclusiveness if full population health benefit is to be achieved.¹⁵ For GRxAF to be successful in meeting the needs of the community, it requires sufficient resourcing to allow a service that is readily available, and that meets the cultural needs of its participants, irrespective of socioeconomic or cultural barriers.

The adult model Green Prescription has been reported to be cost-effective in terms of quality adjusted life years (QALYs) when compared with 'usual care'.¹⁶ The Green Prescription programme was shown, in a well-conducted cluster randomised trial, to lead to increased energy expenditure at 12 months compared with baseline ($p=0.01$), and improved reported quality of life in domains of general health ($p<0.0001$) and vitality ($p=0.047$).¹⁷ However, significant improvements in BMI (a secondary outcome), blood pressure, or four-year risk of coronary heart disease were not found.

Previous evaluations of GRxAF have questioned its utility. In 2008/2009, a process and outcome evaluation was undertaken of GRxAF for 55 children in three sites: Harbour Sport (North Harbour Region), Sport Waitakere, and Sport Wellington. Reported participation in physical activity increased due to participation in GRxAF, but this was not reflected in accelerometer data ($n=15$). Change in BMI from baseline to six-month follow-up was -1.0 kg/m^2 ($p=0.001$; $n=55$), with a BMI z-score change of -0.3 overall ($p<0.0001$; $n=55$).¹⁴ An improvement in dietary habits was observed. Total cost per participant in this 2008–09 evaluation was NZ\$1,140, with an incremental cost-effectiveness ratio for children of $<\text{NZ\$1,200}$ per QALY.¹⁴ Harbour Sport was deemed to be cost-effective, but the cost-effectiveness of the programme across all three centres was questioned.¹⁴

However, BMI rather than BMI z-scores were used in the cost-effectiveness analysis, which is not the most accurate outcome measure to use in such a wide age range (5–14 years). The general principle when addressing child obesity before adult height is attained is not to aim for weight loss, rather to aim for minimal weight gain, allowing children to grow into their weight.⁸ BMI is not an accurate measure of outcome over this time course, and in this situation, BMI z-score is preferred.

Overall, qualitative evaluations of GRxAF have been overwhelmingly positive. In 2013, the six GRxAF national survey interviewed 133 participants, showing that, as in all years since 2008, the contract holders of the GRxAF programme were exceeding all KPIs set by the Ministry of Health (e.g. measures around satisfaction of participants, motivation to stay physically active, and changes to diet).¹⁸

One frustration reported by GRxAF coordinators was the time spent working with families who were not ready to make lifestyle changes, and how participants were not assessed for 'readiness to change'. Incorporation of psychological input is an area where service delivery of GRxAF could be improved. In order to apply the FAB (food, activity, behaviour) model successfully, families need to have access to learning behavioural strategies.^{8,9} We propose an assessment of readiness for change be undertaken at entry to the programme and measured to determine whether it is a predictor of success. If this is the case, then acceptance to the programme could be limited to those most likely to succeed, maximising efficiency and cost-effectiveness of the programme.

The strengths of this audit of GRxAF were that all participants involved were included, rather than those that chose to respond to questionnaires. This allowed outcome, especially as it related to ethnicity, to be more fully described. Limitations include the relatively small sample size, and lack of anthropometric data. We believe that quantitative data, including BMI and BMI z-score, are important in the overall evaluation of such programmes, and should be included as required data. The outcome measure for graduation was obtained by self-report or parent report, and therefore subjective.

Final comments and recommendations

This audit allowed the following recommendations to be made for improving GRxAF Taranaki:

1. Develop strategies to define and improve the rate of graduation from the programme;
2. Identify ways to improve service for Māori, both with respect to access to, and successful graduation from, the programme. This also applies to Pacific children, despite low numbers in the region;
3. Consider how to assess readiness for change at entry;
4. Involve a psychologist in the programme, with a particular focus on retention for the programme duration;
5. Encourage weekly activity/nutrition sessions as an essential programme component;
6. Collect anthropometric data at baseline, halfway and completion of participation, thereby improving feedback for participants and programme evaluation;
7. Educate referrers regarding programme content and families' expectations; and
8. Review the programme duration necessary to achieve meaningful lifestyle change.

This audit adds to the body of evaluation, highlighting the importance of achieving regular participation, targeting at-risk populations, and improving accessibility. The home visit and whānau-based model of GRxAF provides an example of how this approach can improve accessibility to health care and intervention programmes for at-risk groups. Utilising structures already within the community (ideally whānau-based), and improving access to services are key principles underpinning He Korowai Oranga: The Māori Health Strategy, and Whānau Ora.^{8,19}

In conclusion, our audit of the GRxAF programme in Taranaki showed it met a need for some but not all obese/overweight children. Further research is needed with a multidisciplinary intervention model within New Zealand, potentially an expanded version of GRxAF. A randomised trial of such an intervention is currently underway in the Taranaki region.

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