# Using appreciative inquiry methodology to develop a weight management program for obese children in New Zealand

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## Abstract

**Objectives**: Paediatric obesity predicts adult obesity, and alarming new data in New Zealand reveals that obesity among the young continues to rise. In this study, we used a novel solution-focused paradigm, or appreciative inquiry perspective, to explore the factors that influence not just obese but non-obese states (that is, healthy weight as well as obesity), in Pacific adolescents (aged 13–17) living in socioeconomically deprived neighbourhoods.

**Methods**: Sixty-eight parents and adolescents from 30 families were recruited and interviewed, resulting in 15 obese and 15 healthy weight adolescents participating in the study.

**Results**: Our findings showed that, despite living in low socioeconomic circumstances, parents were able to alter their micro-environments to prevent obesity in their children. Parents with healthy weight adolescents had food rules in the home and monitored their children's eating and television viewing time.

**Conclusions**: An appreciative inquiry approach to obesity research can uncover resiliency factors within families that can be applied to obesity prevention and treatment programs.

**Implications for public health**: Appreciative inquiry methodology is a promising alternative qualitative research strategy for developing health interventions for low-income ethnic minority communities.

**Key words**: paediatric obesity, obesity prevention, health behaviour, qualitative research, Pacific

In the 'developed' world, paediatric obesity is highest among population groups in urban, low-socioeconomic environments.[1] In the South Pacific region, young Pacific New Zealanders have one of the highest rates of obesity in the world,[2] with Pacific youth burdened with obesity rates three times that of the general population (63.7% v 26.5% for adults; 23.3 v 8.3% for children, respectively).[3] These disparate rates and the lack of empirical data to support the development of preventive and management actions to address obesity among Pacific populations in New Zealand created the need for a socio-cultural study based in a solution-focused paradigm, or appreciative inquiry perspective, to explore the factors that influence healthy weight as well as obesity.[4]

An alternative research strategy that may be useful for guiding obesity interventions, particularly among low-income urban communities, involves the examination of people who are successful at healthy weight maintenance. Because not everyone is overweight or obese, the identification of the modifiable behavioural characteristics associated with 'weight maintainers' (i.e. people who have successfully maintained a stable healthy weight over time) may assist in the development of effective strategies aimed at preventing excessive weight gain in others.[5,6]

In this study, we used an appreciative inquiry (AI) methodology, which has roots in both action research and organisational development.[7] In AI, the research is directed towards appreciating what it is about the social world that is positive and identifying assets and associated factors. AI seeks to discover what works within communities and/or organisations of interest, and is based on the assumption that solutions may already reside within communities.[8] AI has been described as asset based, ethnographic and participatory, ideal for strategic planning, and a system-wide approach to resolving social tribulations.[9] Cram[10] proposes that such an approach is particularly useful for minority groups with a research history that focused on deficits. Research that focuses on deficits provides limited insight to affect structural change and does not appreciate the existing community strengths and resources that can be marshalled and leveraged to affect change. As a strength-based approach, AI is focused on future aspirational change and can be applied readily within communities of interest.

According to Robinson and Sirard,[4] the critical focus on solutions, rather than deficits or problems in research paradigms, is fundamental to solving modern day health epidemics, including childhood obesity. The most basic difference between a problem-oriented versus a solution-oriented research paradigm is that the former focuses on identifying etiologies and

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correlates of diseases and their risk factors. The underlying assumption is that identifying the causes of adverse health outcomes is a necessary first step to developing effective interventions, which is the predominant model of disease-oriented biomedical and social science research. In contrast, a solution-focused research paradigm proposes to identify solutions to improve health rather than simply identifying the causes of poor health; it is a future-focused method, which is the practiced paradigm of medical and public health professionals, who intervene in 'real world' settings with patients and or communities, without the necessary knowledge of actual cause.[11] In this respect, the underlying assumption of solution-focused research paradigm is that it is not always necessary or even helpful to simply identify causes and correlates of diseases and risk factors before being able to develop effective health interventions. Solution-oriented research is forward-looking, and concerned with what interventions will prospectively promote health and prevent disease. The answer to the solution-oriented research questions (whether positive or negative) can be translated directly into an intervention strategy or policy.[4]

In the health literature, AI methodology, which views research entities as groups or as organisations, is closely related to concepts such as 'resiliency' or 'positive deviance'.[12] There is a body of work on positive deviance that seeks to examine the practices and behaviours of individuals within a community who, with the same resources, have achieved better results than their peers.[13] Positive deviance is inductive and qualitative in nature because it uses the experiences of individuals who have better health outcomes than the majority, and analyses their behaviours to determine what practices they used to achieve successful outcomes.

Positive deviance has been applied in past research to examine the experiences of participants who had successfully completed a weight loss program and who had maintained weight loss over a period of time post-intervention.[13,14] Our study is unique in that it does not follow up participants from a weight loss program, but seeks to understand the food and physical activity behaviours of ethnic minority adolescents and their families from the same low-income neighbourhood community, and juxtaposes the experiences of households with an obese adolescent to a non-obese or healthy weight adolescent.

In many respects, appreciative inquiry methodology and positive deviance follow the principles of solution-focused research paradigm, particularly in respects to finding solutions to entrenched health struggles. Both advocate that solutions from within the group or community being researched have much better traction and accessible implementation because the group is more likely to accept the strategies that came from 'one of their own' and not from an external expert.[12,15] Both approaches acknowledge that groups experiencing health adversity for a period of time can build resistance to externally built best practice models because the models are perceived as being insensitive to the idiosyncratic climate and culture of the intended beneficiary/client group.[16] Cram[10] suggests this would apply particularly to minority and indigenous groups who are often marginalised by society and, thus, experience greater social and health inequities. Advocates of appreciative inquiry methodology call this seeking the 'grass-roots' solution in comparison to the commonly used 'top-down' approach. In this study, we used appreciative inquiry and not the positive deviance approach because, while paediatric obesity prevalence for New Zealand Pacific children is higher compared to the rest of the population (23.3% v 8.3%), it is not common among the study community.[17]

In New Zealand, as in other countries, obesity is highest among its lowest socioeconomic groups and in its ethnic minority groups.[2,18] Pacific people, who make up nearly 7% of New Zealand's 4.4 million population, have an almost three-fold higher risk of being obese compared to the general population (63.7% v 26.5% for adults; 23.3 v 8.3% for children, respectively).[17] Recent temporal data shows that obesity among New Zealand's young people continues to increase, however, the prevalence of obesity increased significantly for Pacific adolescents from 27% in 2007 to 34% in 2012.[3] In the New Zealand context, 'Pacific peoples' as an ethnic grouping classification in official statistics comprises peoples from seven culturally and linguistically distinct South Pacific islands nations: Samoa, Cook Island, Tonga, Fiji, Niue, Tokelau and Tuvalu.

Within the complex multiple systemic factors influencing childhood obesity, structural factors, that is, socioeconomic status (SES) and poverty have been found to mediate most health behaviours, including eating and physical activity for Pacific people in New Zealand.[19-21] However, as hypothesised by Ball and Crawford, not everybody is gaining weight and the identification of those modifiable characteristics of 'weight maintainers' may assist in the development of strategies aimed at preventing obesity and managing weight.[5]

Using an AI approach, this study examined the factors that influenced the eating and physical activity behaviours of obese and healthy weight Pacific adolescents and from the perspectives of their parents. The responses of obese adolescents and their parents were compared to their non-obese or healthy weight counterparts to extract factors that were unique or more common to healthy weight adolescents and their parents. This study approach was chosen specifically to illuminate strategies employed by ethnic minority families from low socioeconomic areas to promote health and wellbeing among their children. These will be used to develop a family-led weight management program for obese Pacific children in New Zealand.

## Methods

Sixty-eight individuals (33 students and 35 parents) from 30 Pacific Islander households took part in in-depth interviews. Table 1 shows the demographic characteristics of study participants. Parents were invited to participate if their child self-identified as being Pacific and took part in a school-based intervention program called Obesity Prevention in Communities (OPIC), which was delivered in South Auckland schools located in low SES communities from 2005 to 2009.[22] The interviews took place during secondary school terms 1–3 in 2006 from the months of March to September. Auckland City is New Zealand's largest city and has the largest concentration of Pacific peoples (Polynesians) in the South Pacific.

Parents filled out a demographic form prior to the interview session. The majority of households had an employed parent (83%) and a combined parental income in the low-mid range of $30–$60K per year (not adjusted for total household size). Seventy per cent of families lived in large extended family groups (average household size 7.4; range 3–13), with many dependent children (average of 3.5; range 1–7). Most parents were Island-born (86%) and bilingual (86%), and 30% were mixed parental-ethnicity households.

### Procedures

Researchers visited participating OPIC schools and used a flyer to invite eligible adolescents to be part of the study. The students met researchers for a study briefing and took home study information sheets and consent forms for their parents' review and consent. Students and parents who provided consent and assent, respectively, were interviewed on separate occasions at a venue of their choosing. Students and parents could opt for the interviews to be conducted in their language of preference, which resulted in eight interviews being completed in the Samoan or Tongan language and the remainder in English. Most student interviews took place after school at a school office space, or within their homes during school holiday break times. All parent interviews took place at their homes and, in some instances, more than one parent/caregiver was interviewed at the same time (five interviews).

### Assessments

Adolescents' weight status was assessed using BMI measurements and international cut-off points recommended by the International Obesity Taskforce.[23] Weight in kilograms was taken using an electronic scale (BC418 Body Composition Analyzer, Tanita, UK) and height was measured to the nearest 0.1 cm with a standard portable stadiometer. Adolescents were randomly selected for interviews, depending on weight status (healthy weight and obese students only). Household location was deemed important for comparing equivalent environmental influences, so families were recruited from the same catchment area of Mangere, South Auckland, which is a low SES (low-decile) neighbourhood.

### Interview questions and data analysis

The scope of the interview included questions on eating and physical activity patterns, the influences on behaviour, and knowledge about the health consequences of physical activity, food and eating habits. The specific questions asked can be found in the results section. A timeline exercise was used at the beginning of the interview to capture daily life routines and eased interview participants into the study topics. Indigenous Pacific research principles, cultural processes, and strategies were followed for interviews.[24] The Pacific languages transcripts were translated, transcribed, and analysed by the same bilingual researchers. Translation and transcription of interview data took place immediately after interviews were completed and data analyses followed thereafter. Participant consent was achieved for all participants and the study met the University of Auckland's Human Participants Ethics Committee standards for undertaking research. Transcripts were transcribed and analysed using the grounded theory inductive approach.[25] Five interviews were completed as part of a pilot test to check the validity of the questions. The data from the five pilot transcripts revealed content validity and were subsequently included as part of the main data set. These five transcripts were analysed by two researchers separately, who then formed initial coding and sub-themes from the text. The agreed subthemes were used to guide the analysis of subsequent transcripts. The two analysts, who were also the study interviewers, discussed the findings from each interview transcript and formed new themes as required.

**Table 1: Participants' demographic variables.**

| Demographic variable | Students | | Parents | |
|---|---|---|---|---|
| | n | % | n | % |
| **Gender** | | | | |
| Male | 16 | 48.4% | 6 | 17.1% |
| Female | 17 | 51.6% | 29 | 82.9% |
| **Age range** | | | | |
| 13-15 | 15 | 45.5% | - | - |
| 16-17 | 18 | 54.5% | - | - |
| 18-35 | - | - | 4 | 13.4% |
| 36-45 | - | - | 14 | 46.6% |
| 46-55 | - | - | 10 | 33.4% |
| 56-65 | - | - | 2 | 6.6% |
| **Birthplace** | | | | |
| NZ | 24 | 72.7% | 5 | 16.7% |
| Non-NZ | 9 | 27.3% | 25 | 83.3% |
| **Weight status**[a] | | | | |
| Obese | 17 | 51.6% | - | - |
| Healthy weight | 16 | 48.4% | - | - |
| **Ethnicity**[b] | | | | |
| Samoan | 17 | 39.5% | 13 | 37.1% |
| Cook Island | 9 | 20.9% | 8 | 22.9% |
| Tongan | 9 | 20.9% | 5 | 14.3% |
| Niuean/Other | 3 | 7.1% | 2 | 5.7% |
| NZ Maori | 4 | 9.3% | 4 | 11.4% |
| NZ European | 1 | 2.3% | 3 | 8.6% |

*a: Cole-criteria BMI defined, Obesity BMI ≥ 30kg/m2*

*b: Ethnicity-All-Count, participants chose multiple ethnicities, so total numbers & percentages do not add up to 100%.*

## Results

The data analysis was guided by an overall question: 'How did the two households, one with an obese adolescent and one with a healthy weight adolescent, differ in terms of food and physical activity practices in the home?' We found that parents of healthy weight adolescents had three nutritional and physical activity practices that were not present in households of obese adolescents.

1) Parents with healthy weight children regularly ate breakfast and lunch meals while parents with obese children would often skip these meals due to time constraints frequently related to work commitments. Parents' patterns of meal consumption were matched by their children's patterns, as self-reported at separate interviews. In addition, obese weight children would often substitute home breakfast meals with high-energy store-bought food as breakfast 'on-the-run', as these quotations from a mother and her son attest:

> *I don't usually have breakfast. I have a coffee maybe and that's it. I'm just too busy and by the time I get them [children] up, get myself ready, clean up because I like to have my house clean, do the washing, then sit down and have a coffee, by then it's about 8.30am so we're in the car and gone. It is a rush all the time. I don't think I ever have breakfast and even in the weekends too, just grab a coffee. It's probably not a good thing, but yeah, I usually just grab something to eat closer to lunch time.* (Cook Island Mother, aged 45)

> *Usually I don't have breakfast 'cos we rushing around in the morning, so yeah we pick up breakfast [from the shop] and then I come here [to school] … [For breakfast] I usually buy me a fizzy drink, a Fanta [full-sugar carbonated beverage] and sometimes a pie.* (Male student, aged 15)

Time-constrained parents, who skipped meals, often ate one main meal in the evening of larger portion size to compensate for missed meals. Snacking on energy dense foods was also another way to compensate for missed meals. Many parents of obese adolescents worked night-shift employment hours, and used food to counteract sleep deprivation. Some talked about the way in which irregular working hour routines can affect eating habits:

> *Yeah, I eat more in the night shift, because I'm on at nights and it's not a good shift for your body and generally I've put on a lot of weight since I have been working in the night shift and lot of trying to take in calories just trying to keep awake or trying to keep going.* (Cook Island mother, aged 39)

2) Parents with healthy weight adolescents reported having specific household food rules, such as having homes free of 'fizzy drinks' (carbonated sugary beverages);

cooking predominantly homemade meals rather than purchasing takeaway meals; and not purchasing junk food or energy-dense snack foods for home consumption. These household practices were observable particularly by parents who had health knowledge that was reinforced on a regular basis. For example, parents that worked in health-related fields or were managing chronic illness with a family member had working or daily life experiences that seemed important in affirming knowledge about food, nutrition and general health, as illustrated by the quote below.

> *Yeah, we do have food and drinks rules at home. Like if I cook something they [the children] have to eat it, they can't get something from the shop, or if my brother or sister cooks something they have to eat it, and they are only allowed water – no fizzy drinks. But they only have takeaways on a rare occasion, like today is a birthday so we are having KFC [Kentucky Fried Chicken] but apart from that no, no lollies, no chippies, only on rare occasions we buy them, even on our [food] shopping days, I don't allow to buy chippies or chocolates. … My Mum, she is on dialysis so she always tells us that sugar is no good for your kidneys and plus it's not only that, but for your heart as well, so we ended up having just water.* (Cook Island aunt, aged 38).

Parents who grew up with rules about food in their homes were more likely to instil these in their own families; for example, monitoring the eating of vegetables for dinner meals was an often-quoted example of an eating rule. Parents with healthy weight children were also clear about employing an authoritarian, rather than a permissive style of parenting with regards to children's eating habits and preferences.

> *When I used to live with my Auntie when I came to NZ, she always makes healthy foods for us, you got one piece of meat and veges (small portion) but you get maona [full belly/ satisfied] with it. My Aunty is my role model. She is 73 years old, she is still active walking and my Uncle is about 80 soon but he is still healthy, still active and going to church. … So I do instil food rules, like not allowing fizzy drinks in our house and making sure the kids eat their peas and other veges.* (Samoan mother, aged 36)

3) Another key difference between households with healthy weight and obese adolescents was having rules that limit daily time on screen-based sedentary activities such as television viewing and electronic gaming.

> *But we have a rule from Monday to Friday no TV and no Playstation games. They [children] are only allowed these things in the weekend, only [from] Saturday then we open the TV for all of us. Our usual routine is when we get back to the house [after-school pick up], they [children] shower, do their homework, no more TV, do the homework first and then I make them dinner, by that time its eight o'clock [pm], they can play outside but we don't have TV, we might have it on at our bedroom, but not at the children's bedrooms.* (Tongan father, aged 45)

Parental presence at home and the use of time management skills to enable this was another key difference between obese and healthy weight adolescent households. For example, 13 out of 15 (86%) healthy weight student households were more likely to have a full-time or part-time parent at home compared to 8 out of 15 (53%) obese student households. In addition, working parents of healthy weight adolescents often chose to work dissimilar shift work arrangements so at least one parent was present at home to prepare and monitor their children's meals, as well as to allow for extra time and support to transport children to sporting activities.

## Discussion

We used an Appreciative Inquiry methodology to uncover what was unique between the households of obese and healthy weight Pacific adolescents in a low-SES neighbourhood. Results of the analysis by weight status revealed differences between households of healthy weight and obese adolescents in ways that confirmed previously identified protective factors against obesity.[26,27] To summarise, behaviours undertaken most often by healthy weight students and their parents included having regular patterns of breakfast and lunch meals and having particular home-based food rules such as decreasing amounts of energy-dense drinks and snack foods in the home and ensuring a regular intake of vegetables as part of the evening meal. Home rules about limiting television and electronic gaming viewing were also distinct to households of healthy weight adolescents.

In 2003, the World Health Organization compiled a list of the environmental factors that research has shown to promote or protect against weight gain and obesity, divided according to the strength of the available evidence.[27] In the context of Pacific communities, this study validates existing evidence for the protective function of regular physical activity against unhealthy weight gain, with data showing sedentary lifestyles, particularly sedentary occupations and inactive recreation such as watching television, promote weight gain.[28] A reduction of 30 minutes of television viewing a day has been shown to be effective in reducing weight, particularly as it has been found that children often eat high energy-dense micronutrient poor foods or snacks while watching television.[29,30] The findings from this study support the recommendation for homes to limit children's television viewing and other sedentary electronic gaming activities.[31]

Increasing evidence exists showing that passive over-consumption of calories from energy-dense foods, that is, foods that are high in fat and sugar and low in water and fibre, and particularly the consumption of sugary beverages, promote weight gain.[32] The New Zealand Children's Nutrition Survey[33] showed an increasing number of New Zealand children (ages 5–14 years) drink carbonated beverages at least weekly (45%), with the highest intake by Maori and Pacific children, matching their higher obesity prevalence. A recent international review confirms the obesity-promoting effects of high sugar diets.[34] Our recommendation for obesity prevention would be to follow the practices of families with healthy weight adolescents, who make a conscious choice to limit fizzy drinks (carbonated sugary beverages) in their home environment. Many other countries and city-wide districts have adopted public health policies to regulate the consumption of sugary beverages[35] and some schools in New Zealand, by their own leadership, have implemented fizzy drink bans at school. It is our recommendation that, given New Zealand's high population obesity rate, a public health policy needs to be implemented for all New Zealand schools to follow convincing empirical evidence and WHO guidelines about limiting carbonated sugary beverages.[27] The Healthy Schools Food Policy (implemented in 2008 by New Zealand's previous government and overturned by its current government) stipulated that all public schools should follow the nutritional guidelines. We recommend this policy should be re-established with a focus on banning the sale of carbonated sugary beverages in children's school environments.

A growing consistent body of evidence associates obesity with lower socioeconomic status in developed countries, particularly among women. The WHO[36] report suggests this is because people living in deprivation are most at the mercy of obesogenic environments, with their eating and activity behaviours set at the 'default choices' on offer; for example, food choices limited by cost or whatever is geographically available. Current studies have not elucidated whether the association between SES and obesity is bi-directional, nor are the mechanisms through which SES influences food and activity patterns clear, but longitudinal studies have shown a consistent effect with lower SES predisposing obesity.[37-39] This study suggests that poverty-related stress, which includes the limitation of parental time at home, rather than just absolute income, seems to also negatively influence healthy behaviours. Despite long-standing patterns of obesity prevalence being burdened on the most impoverished population groups in Western societies, surprisingly very little research has been completed in the area of poverty and its association with obesity. This is a limitation that future research in the field should address.

## Conclusions

Undertaking appreciative inquiry approach to obesity research can uncover resiliency factors within families that can be applied readily to obesity prevention and treatment programs. The most promising aspect of this alternative research strategy is that it is relevant to research participants seeking immediate advice and gives hope to families living in impoverished circumstances, that solutions lie within their own communities. This may be particularly effective for Pacific people and other ethnic minority groups, who value role modelling from families with similar circumstances and backgrounds.[40]

The findings showcase that it is possible for some individual agency to occur in difficult situations, although in line with current literature, the macro-environmental factors mattered the most and should continue to be advanced as a priority.

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## References

1. Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. *Obes Rev*.2004;5:4-85.
2. Rokholm B, Baker JL, Sørensen TIA. The levelling off of the obesity epidemic since the year 1999 – a review of evidence and perspectives. *Obes Rev.* 2010;11(12): 835-46.
3. Utter J, Denny S, Teevale T, Peiris-John R, Dyson B. Prevalence and recent trends in overweight, obesity, and severe obesity among New Zealand adolescents. *Child Obes.* 2015;11(5):585-9.
4. Robinson TN, Sirard JR. Preventing childhood obesity; a solution oriented research paradigm. *Am J Prev Med.* 2005;28(2S2):194-201.
5. Ball K, Brown W, Crawford D. Who does not gain weight? Prevalence and predictors of weight maintenance in young women. *Int J Obes.* 2002;26:1570-8.
6. Wing RR, Phelan S. Long-term weight loss maintenance. *Am J Clin Nutr.* 2005;82 Suppl 1: 222-5.
7. Cooperrider DL, Whitney D, Stavros JM. *Appreciative Inquiry Handbook*. Brunswick (OH): Crown Custom Publishing; 2008.
8. Whitney D, Trosten-Bloom A. *The Power of Appreciative Inquiry; A Practical Guide to Positive Change*. San Francisco (CA): Berrett-Koehler Publishers; 2010.
9. Boyd NM, Bright DS. Appreciative inquiry as a mode of action research for community psychology. *J Community Psychol*. 2007;35(8):1019-36.
10. Cram F. Appreciative Inquiry. *MAI Rev* [Internet]. 2010 [cited 2011 Aug 1];3. Available from: http://www.review.mai.ac.nz/index.php/MR/article/view/366/527
11. Potvin L, Petticrew M, Cohen ERM. Population health intervention research: Developing a much needed science of solutions. *Prev Med.* 2014;61:114-5.
12. Pascale R, Sternin J, Sternin M. *The Power of Positive Deviance: How Unlikely Innovators Solve the World's Toughest Problems*. Boston (MA): Harvard Business School Publishing; 2010.
13. Fowles ER, Hendricks JA, Walker LO. Identifying healthy eating strategies in low-income pregnant women: Applying a positive deviance model. *Health Care Women Int.* 2005;26(9):807-20.
14. Stuckey HL, Boan J, Kraschnewski JL, Miller-Day M, Lehman EB, Sciamanna CN. Using positive deviance for determining successful weight-control practices. *Qual Health Res.* 2011;21(4):563-79.
15. Walker LO, Kim S, Sterling BS, Latimer L. Developing health promotion interventions: A multisource method applied to weight loss among low-income postpartum women. *Public Health Nurs.* 2010;27(2):188-95.
16. Potvin L, Cargo M, McComber AM, Delormier T, Macaulay AC. Implementing participatory intervention and research in communities: Lessons from the Kahnawake Schools Diabetes Prevention Project in Canada. *Soc Sci Med.* 2003;56(6):1295-305.
17. N Z Ministry of Health. *A Portrait of Health: Key Results of the 2006/07 New Zealand Health Survey*. Wellington (NZ): Government of New Zealand; 2008.
18. Ng C, Corey PN, Young TK. Socio-economic patterns of obesity among aboriginal and non-Aboriginal Canadians. *Can J Public Health*. 2011;102(4):264-8.
19. Rush E, Puniani N, Snowling N, Paterson J. Food security, selection, and healthy eating in a Pacific Community in Auckland New Zealand. *Asia Pac J Clin Nutr.* 2007;16(3):448-54.
20. Lanumata T, Heta C, Signal L, Haretuku R, Corrigan C. *Enhancing Food Security and Physical Activity: The Views of Maori, Pacific and Low-income Peoples*. Wellington (NZ): University of Otago Health Promotion and Policy Research Unit; 2008.
21. Teevale T, Thomas DR, Scragg R, Faeamani G, Nosa V. The role of sociocultural factors in obesity etiology in Pacific adolescents and their parents: A mixed-methods study in Auckland, New Zealand. *N Zl Med J.* 2010;123(1326):26-36.
22. Swinburn BA, Pryor J, McCabe M, et al. The Pacific OPIC Project (Obesity Prevention in Communities) objectives and designs. *Pac Health Dialog.* 2007;14(2):139-46.
23. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: International survey. *BMJ*. 2000;320(7244):1240-3.
24. Health Research Council of New Zealand. *Guidelines on Pacific Health Research*. Auckland (NZ): Government of New Zealand, 2005.
25. Thomas DR. A general inductive approach for analyzing qualitative evaluation data. *Am J Eval.* 2006;27(2): 237-46.
26. van der Horst K, Oenema A, Ferreira I, et al. A systematic review of environmental correlates of obesity-related dietary behaviors in youth. *Health Educ Res.* 2007;22(2):203-26.
27. World Health Organization. *Diet, Nutrition and the Prevention of Chronic Diseases: Report of a Joint WHO/FAO Expert Consultation*. Geneva (CHE): WHO; 2003.
28. Robinson TN. Television viewing and childhood obesity. *Pediatr Clin North Am.* 2001;48(4):1017-25.
29. Utter J, Scragg R, Schaaf D. Associations between television viewing and consumption of commonly advertised foods among New Zealand children and young adolescents. *Public Health Nutr.* 2006;9(5):606-12.
30. Hancox R, Milne B, Poulton R. Association between child and adolescent television viewing and adult health: A longitudinal birth cohort study. *Lancet.* 2004;364: 257-62.
31. Tremblay M, Leblanc A, Kho M, et al. Systematic review of sedentary behaviour and health indicators in school-aged children and youth. *Int J Behav Nutr Phys Act*. 2011;8:98.
32. Giammattei J, Blix G, Marshak H, Wollitzer A, Pettitt DJ. Television watching and soft drink consumption: Associations with obesity in 11-to-13 year old school children. *Arch Pediatr Adolesc Med.* 2003;157(9):882-6.
33. N Z Ministry of Health. *NZ Food NZ Children: Key Results of the 2002 National Children's Nutrition Survey*. Wellington (NZ): Government of New Zealand; 2003.
34. Te Morenga L, Mallard S, Mann J. Dietary sugars and body weight: Systematic review and meta-analyses of randomised controlled trials and cohort studies. *BMJ.* 2013;346:e7492.
35. Johnson DB, Bruemmer B, Lund AE, Evens CC, Mar CM. Impact of school district sugar-sweetened beverage policies on student beverage exposure and consumption in middle schools. *J Adolesc Health.* 2009;45 Suppl 3:30-7.
36. World Health Organization. *Obesity: Preventing and Managing the Global Epidemic: Report of a WHO Consultation*. WHO Technical Report Series No.: 894. Geneva (CHE): WHO; 2000.
37. Poulton R, Caspi A, Milne BJ, et al. Association between children's experience of socioeconomic disadvantage and adult health: A life-course study. *Lancet.* 2002;360(9346):1640.
38. Sherwood NE, Wall M, Neumark-Sztainer D, Story M. Effect of socioeconomic status on weight change patterns in adolescents. *Prev Chronic Dis.* 2009;6(1):A19.
39. Wang Y, Beydoun MA. The obesity epidemic in the United States--gender, age, socioeconomic, racial/ethnic, and geographic characteristics: A systematic review and meta-regression analysis. *Epidemiol Rev.* 2007;29:6-28.
40. Teevale T, Taufa S, Percival T. Acceptability and non-compliance in a family-led weight-management programme for obese Pacific children. *Public Health Nutr*. 2015;18(14):2625-33.