

# Proposing Specific Guidelines to Prevent and Treat Childhood Obesity in Samoa

Rita Larbie, MA  
Oceania University of Medicine

## Abstract

Steps to Implementing an obesity prevention and treatment program for children in Samoa. This will be based on proposing various guidelines to target obese infants and children.

Obesity is a complex problem that scientists and researchers are still working hard to understand. It is an increase in the amount and proportion of adipose tissue relative to normal body composition. One school of thought believes to some extent that genetics might be one of the contributing factors; in others, various combinations of hormonal, metabolic, and behavioral factors appear to play a role. In most cases, it's hard to determine the exact cause of obesity, either than the complex interactions of the above. In recent years, Samoans seem to be fighting this epidemic.

Samoa comprises of nine inhabited islands. Samoans are Polynesians who migrated from the East Indies, the Malay Peninsula, or the Philippines (BPE; Weisler and Kirch 1996). Isolation of these islands, meticulous personal hygiene, high water quality, diets rich in fruits, vegetables, and seafood as well as cultural practices were the basis of Samoan disease-free existence years back. (Tsai et al, 2004).

Obesity in general is a growing health concern in Samoa with health officials stating that it is one of the leading causes of preventable deaths in the Pacific Rim. WHO has officially ranked Samoa the fattest population in the world with estimates as high as 94 percent or 658,000 are obese. Economically, Samoa is relatively successful by American standards. Yet, this rapid modernization came at a high price with most of its population obese according to Garvey, professor of epidemiology and anthropology.

Samoa's current obesity epidemic is at crisis point, since its population is now giving birth to overweight babies, starting life with a plethora of health complications.

One study found that at just 15 months old, 40 percent of boys and 30 percent of girl babies were classed as overweight. According to Forbes, Pacific island nations and associated states make up the top seven on a 2007 list of fattest countries. Samoa is the 6th and has more than 80% of its citizens age 15 and above with an unhealthy weight.

## Why the statewide epidemic in Samoa?

It's hard to understand how human genetics, hormone levels, or metabolic activity and unhealthy lifestyle could cause such a tremendous effect on thousands of Samoans. Obesity has increased sharply throughout the industrialized world. Even worse, the obesity epidemic is rapidly spreading to children in Samoa. It was evident that the median weight gain for Samoan babies in the first 4 months of life is 978g compared to 820

among Americans. This prevalence of obesity in infancy maybe trending in the same direction as in developed countries. Brown university research on childhood obesity alleges that Samoan obesity issue may partially be a response to intrauterine growth restrictions. Mean body mass index at ages 25-54 years is 30-32kg/m for males and that for females is 32-36kg/m in Samoa. These obesity rates may vary by region, age, gender, body size, income, and education among others.

### **Etiology of Obesity**

In order to control the obesity epidemic and its impact on Samoa, we must first understand its causes. Research points in several interesting directions. Metabolic diseases are due in part to lifestyle factors, a genetic disposition, and a programming effect during development. The following are some school of thought.

### **Overweight at Birth**

Obesity begins early in life for Samoans according to Nicky Hawley's research done on 800 infants. The researchers found out that more than one in five infants qualified to be diagnosed as overweight with marked weight increments.

### **Genetic Influence**

Samoans do not view obesity as a health problem because of their larger body frames and excess muscles. It is an issue differentiating between hereditary factors versus overeating. It is believed that a single genomic region on the fifth chromosome can be responsible for the obesity among Samoans according to a research done by McGarvey.

### **Unhealthy Lifestyles**

For several years, Samoans were isolated from the rest of the world, allowing their social, economic and cultural lifestyles to be untapped (Simmet, 1979). Their health issues were community based with a shared sense of wellbeing. Food had both a symbolic and economic importance as opposed to a physiologic or biological importance. (Hughes, 2003). Samoans were initiated into the 20th century within a few years span, thus creating this abrupt epidemic.

Their traditional subsistence standard of living was replaced with a more western lifestyle. Fresh foods, meats, fish, local fruits and vegetables were replaced with rice, sugar, flour, canned meats, canned fruits and soft drinks/beer which are high in calories with little nutritional value. (Simmet, 1979). It's seen as a sign of social status to purchase these imported goods. Almost all the food in American Samoa is imported and therefore expensive, but fast food chains offer a cheaper and convenient alternative.

### **Cultural Identity**

Being big is seen as beauty. Culturally, large physical size is considered an atom of beauty and social status in many of the Pacific Islands including Samoa. (Ringrose and Simmet, 1979, p. 1340). High value is often placed on well-fed individuals.

### **Limited Healthcare**

Though Samoans have access to healthcare, most don't take advantage of these services. A research done by Fitzpatrick and Nietschmann (1993) gave two unique reasons for this. One was due to cultural differences whereby health is not seen as an individual's responsibility as the westerners do. Samoans do not see

obesity as a threat for them to do anything about it. The State or the medical field does not determine their choices health wise. Another is the socioeconomic barrier (money, transportation) and lack of trained health officials, health clinics, hospital, medicines and health equipment. Some Samoans even have the perception that birth control pills and shots used for family planning attributed to their weight gain.

### **Modern Work/Recreation**

A 2011 study showed the relationship between physical activity at the workplace and obesity. Years ago, most jobs require some form of physical activity. Advances in technology, manufacturing, agriculture among others explain the drop in human energy needed at work. If leisure time activity can counteract what is lacking at the work place. Sedentary work and inept recreation accounts for a large portion of the obesity epidemic. Also, high violence and crime rates reduce outside physical activity. Most people are scared to walk, jog, run, cycle or do any physical exercise outside or at late hours.

### **Complications of Obesity**

Being overweight is associated with an array of awful chronic diseases and health complications.

### **General Complications of Obesity**

Diabetes, hypertension, and heart disease are the most obvious consequences of obesity, but other ailments range from cancer, liver disease and subsequent renal failure. It is also linked to asthma, depression, stroke, arthritis, and problems associated with digestion and erectile dysfunction. Most obese patients are plagued with dyslipidemias, orthopedic disorders, sleep disorders, gall bladder disease, and insulin resistance. Pregnancy complications include neural tube defects, pre-eclampsia and perinatal mortality.

### **Complications of Childhood Obesity**

1. Obesity is very harmful and affect their bodies in various ways. Obese children are more likely to suffer from most of the afore mentioned diseases both in childhood and/or adulthood. They are mostly at risk for cardiovascular diseases due to high cholesterol and hypertension. One study indicated that 70% of obese children had at least one CVD risk factor whilst 39% had two or more.
2. Children who are obese are also at increased risk of glucose intolerance, insulin resistance and type 2 diabetes.
3. Another issue obese children face is respiratory distress such as shortness of breath, sleep apnea, and asthma. Distress can also stem from orthopedic and musculoskeletal discomfort making it difficult for them to walk.
4. They are also plagued with fatty liver disease, gallstones, and gastro-esophageal reflux.
5. Most obese children and adolescents have a greater risk of social and psychological problems, such as being ridiculed, discrimination and poor self-esteem, which can extend into adulthood. It is more likely for obese children to easily transcend into obese adults and be faced with all the above comorbid diseases.

### **Common diseases associated with childhood obesity**

1. Genetic: Lawrence Moon Biedl syndrome, Morgan Stuart syndrome, Cohen's syndrome and Carpenter's syndrome.
2. Hypothalamic: Trauma, Leukanicdystrophy, Infiltration diseases like Histiocytosis X, Sarcoidosis, Inflammatory diseases like Meningitis, TB, and Syphilis.

3. Endocrine: Pituitary diseases like Lauren dwarf syndrome and Kallaman's syndrome, Cushing disease, Thymus, and Hypothyroidism.
4. Metabolic: Diabetes Mellitus, Insulinoma, Mesidioblastone, Beckuth-Weedonan syndrome, and Decrun's disease.
5. Mental retardation: Hunter's disease and Down syndrome.
6. Physical disability: Spina bifida, paraplegic and quadriplegic.

### **Certain drugs that induce obesity**

These include sulfonylureas, insulin, estrogen, oral contraceptives, steroids, cyproheptadine, valproate, tricyclic antidepressants and phenothiazine.

40 percent of the Pacific island region's population of 9.7 million has been diagnosed with a form of non-communicable disease, notably cardiovascular disease, diabetes and hypertension. These diseases account for three quarters of all deaths across the Pacific region and 40–60 percent of total health-care expenditure, according to a meeting on obesity prevention and control strategies held in Samoa in September 2000. Globally, obesity is the 5th leading risk factor for deaths; it causes 2.8 million adult deaths, 44% of diabetic burden, 23% of ischemic heart diseases and 7.4% of cancer issues.

### **Assessment of Childhood Obesity**

Body mass index (BMI) is a measure used to assess if a child is overweight or obese. It is calculated using a child's weight and height. Even though BMI does not measure body fat directly, it is often a reasonable indicator of body fatness for most children and teens.

A child's weight status is determined using an age/sex specific percentile for BMI rather than the BMI categories used for adults. This is because the body composition of children varies as they age and also varies between the sexes.

CDC Growth Charts are used to determine the corresponding BMI for specific age and sex percentile. For children and adolescents (aged 2–19 years):

Overweight is defined as a BMI at or above the 85th percentile and lower than the 95th percentile for children of the same age and sex. Meanwhile obesity is defined as a BMI at or above the 95th percentile for children of the same age and sex.

1. Start with clinical assessments like skinfold thickness measurement with a spring loaded caliper example biceps, triceps, subscapular and suprailliac.
2. Look at normal body fat contents. Boys should be 20% with girls at 30%.
3. Look at Index of intra-abdominal fat content. Males should be  $>0.95$  with females  $>0.8$ . Measure with MRI or CT scan.
4. Laboratory tests to check for obesity should include:
  - a. Blood sugar – fasting, post-prandial, GTT, glycosylated Hb.
  - b. Lipid profile – Apo lipoproteins, chylomicrons.
  - c. Lung function tests and Thyroid function tests.
  - d. S.GGT analysis for alcoholic liver disease.
  - e. Kidney function – S. Urea, Creatinine, S. Electrolytes, CCK MB and Urine analysis.

- f. Isotopic measurement of whole body potassium content.
- g. Impedance analysis, Hydrostatic weighing.
- h. Dual Energy X-Ray Absorptiometry (DEXA).

### **Treatment Guidelines**

Managing overweight and obese children require a variety of skills. Physicians play an important role in evaluating and treating such young patients. More important are the special skills of nutritionists, registered dietitians, psychologists, and exercise physiologists. These healthcare practitioners can help these young patients learn to make long term changes and maintain it.

Organizing a team of various healthcare practitioners is one way of meeting the needs of this age group. If that approach is not possible, they can be referred to other specialists required for their particular age group.

The fundamental goal of obesity therapy should be healthy eating and activity. The manipulation of weight maintenance versus weight loss to achieve weight goals is based on each patient's age, baseline BMI percentile, and presence of medical complications. Most experts recommend treatment that begins early, involves the family, and institutes permanent changes in a planned manner.

For Samoan obese children, parenting skills will be the foundation for successful intervention at an early age. Parents must put in place gradual, targeted increases in activity and targeted reductions in high-fat, high-calorie foods for the entire family. Ongoing support for them after the initial weight-management program will help these children and their families maintain their new behaviors:

- a. **Dietary therapy:** Eat healthy meals and snacks. Focus on low calorie, nutrient- dense foods such as fruits, vegetables and whole grains. Avoid saturated fat, limit sweets and alcohol. One can still enjoy small amounts of high fat and high calorie foods as an infrequent treat. Can be achieved in schools through cafeteria menus as well.
- b. **Physical Activity:** According to the American College of Sports Medicine, one needs to get 150 to 250 minutes of moderate-intensity activity a week to prevent weight gain or shed weight. This can be warm up exercises, high energy impart activities for calorie expenditure, stretches, yoga, fast walking, cycling, spinning, and swimming among others. For children, it can be playing soccer, basketball, or any kind of games which require running. Can be achieved through physical education in schools, as well.
- c. **Behavior Modifications:** Lifestyle modifications cannot be made without behavioral changes. First identify situations that trigger out of control eating and avoid food traps that cause you to overeat. Keep a journal and write down what you eat, how much you eat, times you eat, how hungry you were and how full you got. This will depict a pattern. You can then plan ahead and develop strategies to control ones dietary behaviors. Samoans need to change their attitudes and be less tolerant of obesity. This will re-enforce their determination to lose weight, improve self- esteem and enhance self-confidence. Enlist social support network involving family, friends and colleagues. Join and support others in similar situations.

- d. **Pharmacotherapy:** Always use pharmacological agents with ongoing lifestyle intervention can be used for some teenagers. Drugs are the last efforts in maintaining optimal weight. This gives sustained and greater weight loss and lifestyle monotherapy by altering the metabolic process. Keep side effects in mind and plan for frequent monitoring and follow ups. Some drugs include diet supplements like fiber and hydrogel. Orlistat reduces fat absorption whilst Acarbose reduces carbohydrate absorption. Appetite suppressants include Benamphetamine, Phendimetrasone, and Masindol. Others are phentermine, lorcaserin, bupropion, fluoxetine, onisamide exenatide among others. Some breakthrough treatment options are B3 agonists, Dopamine antagonists, opioid antagonist, anti-diabetic drugs, Cytokine regulators, uncoupling protein, Insulotropin, Neuropeptide inhibitors, and OB receptor modulating drugs. Bear in mind of these drugs are contraindicated in pregnancy and interacts with SSRIs and SSNRIs.
- e. **Surgical therapy:** This should be the final resort for teenage patients who have tried every means to lose weight to no avail. This is not advisable for children. This includes gastric bypass, gastric sleeve and gastric band to aid weight loss in those with BMI's >36. It usually causes about 60% weight loss which can be maintained with reduced calorie intake and exercise. It has its side effects and complications like gall stone formation, mal absorption and other nutrition deficiency. Sometimes patients might need cosmetic surgery after excessive fat loss.
- f. **Psychological therapy:** Hypnosis administered by a psychologist helps to aid notions that remain with the patient to help overcome temptation and maintain weight loss.
- g. **Combination therapies:** Any of the treatment modalities can be combined for effective weight loss results and maintenance.

**Recommendations**

To enhance health quality, reduce obesity in Samoa by promoting these objectives:

**Objective 1: Develop a National Health Plan for Samoa**

Activity	How	Who	Time	Measure
Propose a national health plan for Samoa.	Raise awareness,  Conduct consultation, and organize community meetings.	Doctors, healthcare practitioners, legislators, community members or residents.	January 2014	The Plan for effectiveness and success. Continue with plan or modify the plan as needed for success.

**Objective 2: Develop a School Obesity Prevention Program for Samoa**

Activity	How	Who	Time	Measure
Increase awareness of obesity in Samoan schools.	Conduct field day activities, clean up school campuses, implement healthy cafeteria menus, and stock vending machines in schools with healthy snacks.	Principals, teachers, dieticians, chefs, students, parents and office staff.	January 2014	Principals, teachers and cafeteria staff monitor and continue the activities initiated in the future. Consistency is the key to success.

**Objective 3: Continue the existing Community Development Program in Samoa**

Activity	How	Who	Time	Measure
Involve Samoan residents in activities to enhance the Community Development Movement.	Establish health departments, gyms, recreational centers, YMCAs, community exercise programs, health education on obesity and free health screening.	Health professionals, health departments, residents, personal trainers, dieticians, educators, and community health personnels.	January 2014	Monitor its effectiveness and continue with the development program. Consistency is the key to success.

**Additional Recommendations**

Ability to reverse the uphill epidemic of childhood obesity in Samoa will require a combined comprehensive approach by families, schools, communities, industries and government. Samoans can adopt some of America's recommendations put in place by a committee of 19 experts in child health, nutrition, fitness, and public health. According to the report, these recommendations were made in response to requests from U.S Congress to draft an obesity prevention plan based on science and effective approaches.

Samoans need to know that whilst there is no single resolution, the following recommended steps can stop the epidemic of childhood obesity. They are aimed at enhancing healthy diet, improving opportunities for children to engage in physical activities among others.

**Specific Steps Recommended for Children**

1. Schools should implement nutritional standards for all foods and beverages served on their grounds including vending machines. Samoans can follow US Department of Agriculture Dietary Guidelines

for American Students. Samoa must ensure availability and marketing of low calorie, high nutrient foods through federal school-meal programs.

2. Schools should expand opportunities that will allow students to engage in at least 30 minutes of moderate to vigorous physical activity daily through physical education classes, intramural sports, activity clubs, walking, biking, and other venues or programs.
3. School health services must measure each student's weight, height, and BMI annually and give the results to the student and their families. Given that most of Samoan children do not get annual physicals or check-ups, this will bring to light any weight concerns or track their growth process.
4. Industries such as the food, beverage, and entertainment must voluntarily develop and implement guidelines for advertising and marketing directed at children and youth. Samoa's Federal Trade Commission must have the authority to monitor compliance with these guidelines and also establish external review boards to prohibit advertisements that fail to comply.
5. Parents, especially those with obese children must play their part as well by providing healthy foods in the home and also encourage physical activity by limiting recreational television, video games, movies, and computer time to less than two hours each day. They can exert a profound influence on their kids from an early age despite the fact that many societal factors might filter in. Parents can serve as role models and encourage their children to develop healthy varied Samoan diets introduced at an early age. They should consider smaller portions, encourage their kids to stop eating when full, and avoid using food as rewards.
6. Health insurance companies in Samoa must designate childhood obesity prevention as a priority health issue. This must include screening and obesity prevention services in routine clinical practices. Though most insurers focus on the treatment of obesity, its high cost must serve as an incentive to implement preventive measures to curb obesity.
7. Physicians, nurses, dietitians, nutritionists, and other health care professionals must actively discuss the weight and BMI of their underage patients with the children and their parents in a sensitive and age-appropriate manner. Professionals must be careful to avoid stigmatization without compromising the ability to recognize a challenging health problem. Healthcare workers must obtain training, knowledge and skills related to obesity prevention and incorporate it into their examinations to tackle this delicate but pertinent issue.

### **Tips for Samoan Parents**

The number of overweight children in Samoa has increased dramatically in recent years. Overweight is more prevalent in girls than boys and in older preschoolers (ages 4-5) than younger (ages 2-3). Obesity increases even more as children get older. For ages 6 to 11, at least 4 children in five is overweight. Over the last two decades, this number has increased by more than 50 percent and the number of obese children has nearly tripled.



With lifestyle changes, they can implement a family-based treatment program which focus on dietary, physical activity, and behavioral modification. This program must target decreasing overall dietary energy intake, increase levels of physical activity, and decrease time spent in sedentary behaviours like screen time.

I recommend 60 minutes of moderate to vigorous physical activity daily and less than 2 hours in sedentary behaviors per day. Concerning a decrease in total energy intake through healthier eating, I recommend reduction of saturated fat intake for children older than 2 years of age, avoidance of calorie-dense, nutrient-poor foods, increase of fiber, fruit, and vegetable intake.

Parents must plan timely and regular meals, avoid unnecessary snacking inbetween meal, and control portions in accordance with the guidelines of American Academy of Pediatrics. This will promote a long-term management and maintenance after the treatment phase is completed.

Samoan parents should focus on good health, not a certain weight goal. Teach and model healthy and positive attitudes toward food and physical activity without emphasizing body weight. They should also focus on the family and not set overweight children apart. Involve the whole family and work to gradually change the family's physical activity and eating habits.

Establish daily meal and snack times, and eating together as frequently as possible. Make a wide variety of healthful foods available based on the Food Guide Pyramid for Young Children. Determine what food is offered and when, and let the child decide whether and how much to eat. Parents must plan sensible portions by using the Food Guide Pyramid for Young Children as a guide.

### **Proposal on What Counts As One Serving**

Healthy meals and snacks provide nutrition for growing bodies while modeling healthy eating behavior and attitudes.

#### Grain Group:

- 1 slice of bread
- 1/2 cup of cooked rice or pasta
- 1/2 cup of cooked cereal
- 1 ounce of ready-to-eat cereal

#### Vegetable Group:

- 1/2 cup of chopped raw or cooked vegetables
- 1 cup of raw leafy vegetables

#### Fruit Group:

- 1 piece of fruit or melon wedge
- 3/4 cup of juice
- 1/2 cup of canned fruit
- 1/4 cup of dried fruit

#### Milk Group:

- 1 cup of low-fat or fat-free milk or yogurt (learn more about choosing low-fat or fat-free milk)

2 ounces of cheese

**Meat Group:**

2-3 ounces of cooked lean meat, poultry or fish

1/2 cup of cooked dry beans, or 1 egg counts as 1 ounce of lean meat. 2 tablespoons of peanut butter count as 1 ounce of meat.

Four-to-6 year-olds can eat these serving sizes. Offer 2-to-3 year-olds less, except for milk. Two-to-6 year-old children need a total of 2 servings from the milk group each day.

**Suggestions to Samoan Parents**

- Healthy meals and snacks provide nutrition for growing bodies while modeling healthy eating behavior and attitudes.
- Samoan parents must discourage eating meals or snacks while watching TV. Eating in front of the TV may make it difficult to pay attention to feelings of fullness and may lead to overeating.
- Buy fewer high-calorie, low-nutrient foods. Help children understand that sweets and high-fat treats (such as candy, cookies, or cake) are not everyday foods. Don't deprive children of occasional treats, however. This can make them more likely to overeat.
- Avoid labeling foods as "good" or "bad." All foods in moderation can be part of a healthy diet.
- Involve children in planning, shopping, and preparing meals. Use these activities to understand children's food preferences, teach children about nutrition, and encourage them to try a wide variety of foods.
- Make the most of snacks. Continuous snacking may lead to overeating. Plan healthy snacks at specific times. Include two food groups, for example, apple wedges and whole grain crackers. Focus on maximum nutrition - fruits, vegetables, grains, low-sugar cereals, lowfat dairy products, and lean meats and meat alternatives. Avoid excessive amounts of fruit juices, which contains calories, but fewer nutrients than the fruits they come from. A reasonable amount of juice is 4-8 ounces per day.
- Encourage physical activity. Participate in family physical activity time on a regular basis, such as walks, bike rides, hikes, and active games. Support your children's organized physical activities. Provide a safe, accessible place outside for play.
- Limit the amount of time children watch television, play video games, and work on the computer to 1 to 2 hours per day. The average American child spends about 24 hours each week watching television. Reducing sedentary activities helps increase physical activity.

**Complications of Weight Loss**

Weight loss has some adverse effects on patients. One potential complication of weight loss is gall bladder disease which occurs in both adolescents and adults after rapid weight loss. Those who go for the surgery option are faced with hair loss, vitamin and nutrient deficiency.

There is the risk of inadequate nutrient intake although maintaining a well-balanced dietary plan can reduce this after effect. The tendency to slow linear growth during weight loss is high. Usually, this impact on adult stature appears to be minimal.

Weight loss may also cause psychological or emotional harm on the individual. It can lead to eating disorders although a supportive approach to therapy can minimize this effect. Physician must refer patient especially children to counseling should the above arise to help the family deal with it.

### **Maintenance of Weight Loss**

Obesity is a chronic disease that requires a lifelong attention to healthy eating and an active lifestyle. After an initial weight loss program, individuals must continue to work actively to maintain the behaviors that produced their weight loss, weight maintenance and improved BMI percentile.

Nutrition education helps young children develop an awareness of good nutrition and healthy eating habits for a lifetime. Every effective weight loss program must include an equally effective weight maintenance support for the patients. It must include regular contact with clinician to review and reinforce the previous goals of healthy diet and activity as well as new implementation skills.

If obesity persists, new evaluation and goals can be set or evaluate patient for a different weight loss therapy be it medications or surgery to enhance weight loss.

### **Conclusion**

Obesity can be adequately managed by dietary restriction and lifestyle modification by Samoans. They might hardly use drugs and surgery though with current advancement in healthcare, they need to start considering these options or combination of therapies to boost weight loss as well as maintain the loss.

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