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Preventing and Responding to Obesity: What Does Science Tell Us?

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Abstract

Obesity is a complex, multi-dimensional health issue. On local, national and international levels, attempts to prevent and respond to obesity are uniformly unsuccessful. Social and financial costs are rising as the rate of obesity increases. Utilizing a whole person perspective, along with coordinated environmental and individual efforts, this paper offers suggestions for a potentially new understanding and response to the problem.

Introduction – Extent of The Problem

Obesity is now a global epidemic. The World Health Organization (WHO) and the International Obesity Task Force have confirmed a worldwide epidemic even as some developing countries struggle with malnutrition and famine.[1]

Obesity rates are soaring in the United States. Between 1980 and 2000 obesity rates doubled among adults. An estimated two-thirds of the adult population (64%) self-report being overweight (BMI > 25), and almost one-third (30%) self-report being obese (BMI > 30). Hawaii's data follows the increasing trend. The 2005 Behavioral Risk Factor Surveillance System (BRFFS) indicates that 53% of the state's adult population is overweight (33.3% overweight and 19.7% obese).[2]

The 2005 Hawaii Health Survey, which parallels the results of the BRFFS, shows that, of the total overweight adults, 64% of men and 41.2% of women are overweight.[3] Nationally, among all races from ages 20-74 years, the increase in obesity of men out-paces that of women in all groups.[4]

Although affecting all racial groups, risk for overweight and obesity has shown the greatest increases in certain minority ethnic groups including American Indians, Hispanics, and African Americans. Certain communities in Hawaii have significantly higher rates of overweight (See Figure 1). The obesity prevalence among Asian-Americans varies among ethnic groups, i.e., Japanese, Laos, Vietnamese, etc., and also varies between first generation, second generation, and third generation residents.

Just as obesity has doubled for adults in the last two decades, overweight rates have doubled among children and tripled among adolescents.[5] The National Health and Nutrition Examination Survey (NHANES) III (1976-1980) showed that approximately 7% of 6 to 11 year-olds were defined as overweight (BMI above the 95th percentile). By 2003-2004 that figure rose to 19%. Similarly, 5% of 12- to 19-year-olds were found to be overweight in 1976-1980 in contrast to more than 17% defined as overweight in 2003-2004. A recent study of Hawaiian ancestry children in the same age group as NHANES showed that 26.5% of them are overweight compared to 20.7% of children of non-Hawaiian ancestry.[6]

Particularly disturbing is the increase in overweight toddlers and pre-schoolers. A recent study at the University of Hawaii showed the prevalence of overweight in all two- to four-year-olds was more than the expected 5%, especially for Samoans, Filipinos, Hawaiians, and Asians. At age two to four years, overweight was almost twice as prevalent as at age one. Additionally, a State of Hawaii Department of Health study revealed a high proportion (28.5%) of four- and five-year-olds entering Hawaii public schools as overweight and at-risk for

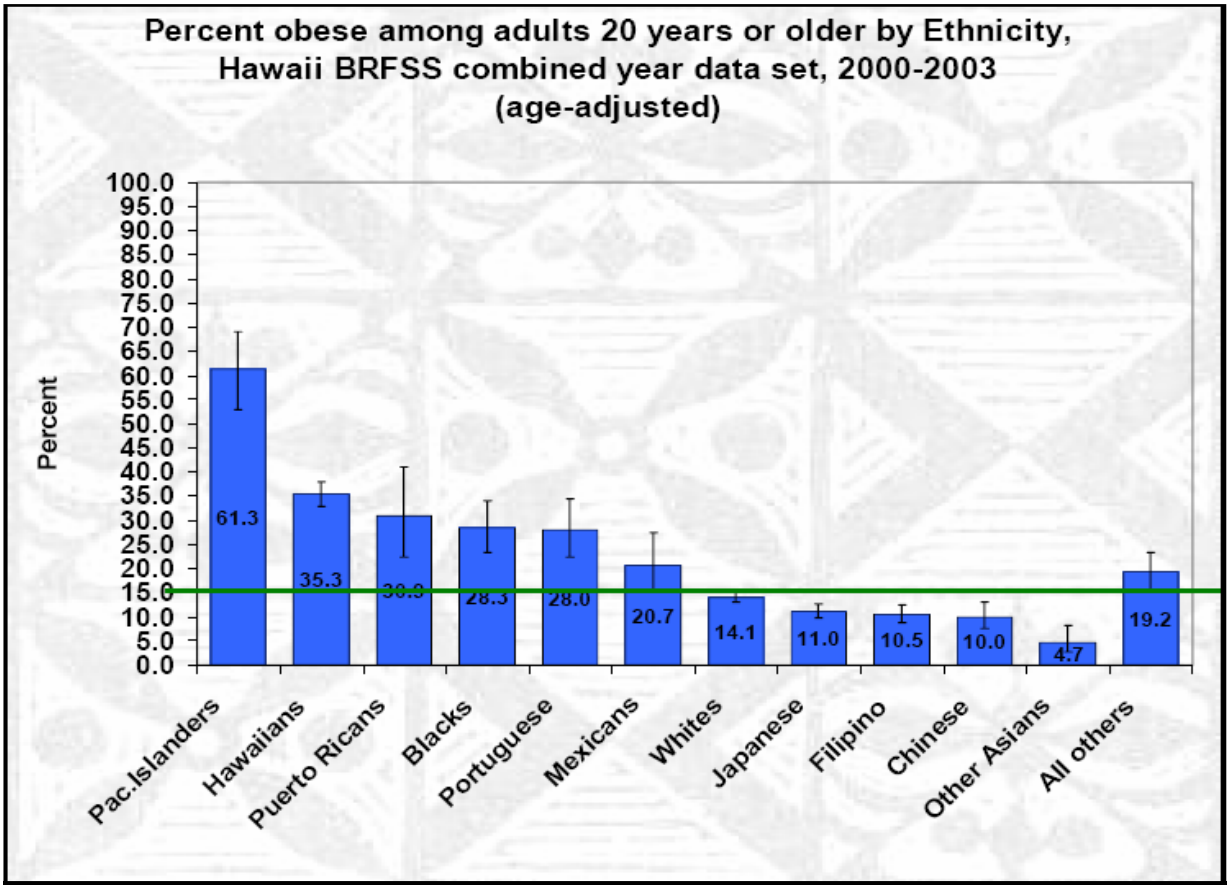

Figure 1.— Percent Obese Among Adults 20 Years or Older by Ethnicity, Hawaii BRFSS Combined Year Data Set, 2000-2003 (Age-adjusted).

overweight in 2002-2003. Variation between school complexes ranged from a low of 17.6% at the Kaiser complex on Oahu to a high of 47.1% at the Hana complex in Maui suggesting rural communities in Hawaii are more likely to have overweight or at-risk-for-overweight kindergarteners entering school.[7]

Many point to the proliferation of the American lifestyle, in particular the availability and consumption of foods high in sugar and fat, fast food restaurants, increased portion sizes and a decrease in physical activities. This affects not only our national obesity rates but also those cultures most influenced by the American lifestyle. For example, 60 years of American military influence in Okinawa has been a contributing factor in shifting Okinawa from a culture with the greatest longevity to one with the fastest growing rate of obesity. Okinawa has, per capita, more fast food restaurants and convenience stores than anywhere else in Japan. Fast foods and other high-sugar and high-fat foods are replacing the traditional Okinawan sea-based diet. The longevity of men has nose-dived and the obesity rate for both women and men is the highest of all in Japan.

The Costs of Obesity

Last year, an estimated $46 billion was spent on diet products and self-help books in the U.S.[8] From a medical perspective the cost in the United States of overweight and obesity and their complications is estimated at $117 billion annually. Hospital costs related to childhood overweight have tripled in the last 20 years. Overweight and obese individuals incur up to $1,500 more in annual medical costs than healthy-weight individuals according to a two-year study of nearly 200,000 employees of General Motors. Average annual medical costs for normal-weight individuals in the study were $2,225, while costs for overweight and obese individuals rose steadily from $2,388 for overweight individuals to $3,753 for the most severely obese persons. [9]

Obesity is clearly a problem that needs to be effectively and creatively addressed.

Understanding Obesity

There is greater awareness than ever before that obesity is a complex issue. The current perspective on the etiology of obesity is that it is influenced by the following factors: genetic, metabolic, environmental, behavioral, cultural, and socioeconomic.[10] These factors can be divided more succinctly into two categories: environmental and individual. The environmental factors look at relationships, the culture, and socioeconomic influences. The individual factors and resulting approaches address the mind, heart, body, and spirit.

Environmental Factors

Many see the modern American lifestyle as the primary culprit. This includes a more sedentary lifestyle (less focus on physical activity and greater time spent at the computer and in front of television), increased food portion sizes, the availability of cheap/fast/fattening foods, greater intake of sugary beverages and less family time.. A recent University of Missouri-Columbia study followed 8,000 children from kindergarten to third grade and found that those who watched the most TV were at greatest risk of being or becoming overweight. Children who ate fewer meals with their families also were at risk for becoming overweight.[11]

Food is cheaper and more readily available than ever before and, at least in American restaurants, the portions are larger. The cheapest food is often the unhealthiest. Not only can we get cheap hamburgers and french fries at nearly every street corner, but fresh fruits and vegetables are among the most expensive items at the grocery store.

Our current lifestyle also finds more families stretched financially. Obesity studies consistently point to socio-economic differences in obesity rates with obesity more prevalent in lower income groups in developed countries. Studies have shown that persistently overweight children live in neighborhoods that parents perceive as less safe for outdoor play. From a nutritional perspective, many low-income families turn to fast food restaurants where they can find lower priced foods such as french fries and hamburgers. These foods are also the most fattening. Low-income families may also not be as aware of, conscious of, or able to afford what constitutes a healthy diet.

Paradoxically, in developing countries, obesity is more likely to be found in the middle and upper classes where it reflects an escape from poverty.

Environmental factors also include the social, cultural, and behavioral patterns that surround the obese person. A cultural environment which emphasizes cheap, high-fat, high-sugar foods, a family environment which encourages eating as a way of proving manhood, eating for self-nurturing, and eating for social purposes, all contribute to obesity. Cultural and ethnic groups also have differing expectations about body weight, size, and attractiveness.

The most recent research on the environmental influence on obesity points to the company you keep. Harvard researchers suggest that obesity is socially contagious, that it spreads through social ties. Based on three decades of research involving 12,000 people, researchers discovered that the odds of becoming obese increased dramatically based on association with obese people. The closer the relationship with the obese person, the greater

the odds of becoming obese. Authors suggest that this may be a result of the spread of behavior and the spread of social norms.[12]

A final environmental influence might be the temperature of the environment. There is evidence that time spent in a moderate temperature environment versus one that is too hot or too cold activates the natural calorie burning process that is built into our system. Thus, heaters and air conditioning can be a contributing environmental factor to obesity. The decrease in smoking has also been identified as a contributor. Smoking has long been used as a method to control weight and when people quit smoking they tend to eat more.[13]

Individual Factors

The environment may contribute to obesity on a cultural level but what is the individual factor within each person which launches that person down the path to obesity or restrains them from taking that path?

Mind and Body – Most individual approaches currently being explored and researched can be divided into two categories – those that address the mind and those that address the body. Those that focus on the body address diet and exercise. Some attention is also being paid to medical and biological factors. These factors are often the most problematic and least often addressed when exploring the physical aspects of obesity. Perhaps because of obesity prejudice, physicians often ignore physical complaints that could take them to the root cause of the obesity. For example, endocrine dysfunction due to the environment may contribute to obesity. Increased use of medications that promote weight gain (steroids, anti-depressants, anti-psychotics, anti-diabetics, anti-histamines and protease inhibitors) may also be a causal factor as well as lack of sleep. Several studies have found that sleep deprivation is associated with an almost two-fold increased risk of being obese for both children and adults. Many researchers suggest that sleep deprivation is linked to lower levels of the hormone leptin which decreases hunger, and higher levels of the hunger-producing hormone, ghrelin..[14]

Cutting edge research is currently exploring the relationship between brain chemistry and obesity. The National Institute for Drug Addiction is looking at brain changes associated with obesity and has found surprising similarities between the brain chemistry of chronic overeaters and those of drug addicts.[15] Research is also underway to explore whether brain chemicals are related to binge eating. Chemicals in the brain, called opiods, can drive up the desire for fatty or sugary foods by 300%.[16]

Individual biological factors include a genetic makeup that contributes to a lower metabolic rate and a propensity to obesity. Studies of identical twins find that when one twin is obese, there is a high likelihood that the

other will be as well. The extent of the obesity, however, can differ substantially.[17] Family history obesity may point to a genetic tendency but could also be a result of behavioral, socio-economic, and cultural factors. Cognitive behavioral therapy dominates the exploration of the role of the mind in addressing obesity. This therapy is the darling of mainstream psychology. It assumes that behavior is regulated by what our mind tells us and that obesity is driven by learned behavior that can be unlearned. Through goal setting, reinforcements, and understanding environmental cues a person can use his/her mind to exercise sufficient discipline to reduce calories and increase exercise. Success is based on weight loss.

The above approaches are criticized for focusing primarily on symptom removal rather than going to the root cause of the obesity. These approaches are equated with cutting off a weed at the top rather than removing it at the roots.[18]

Emotional Factors – Strong evidence points to an emotional component to obesity. Research has shown that a relationship exists between obesity and depression, low self esteem, problems with social relationships, and distorted body image. At least 20% of obese adults report moderate to severe depression.[19] Children and adolescents have problems with peer relationships. Obesity may be a response to these problems. Overeating can become a self-calming tool and produce a sense of disassociation that can become addictive.[20] On the other hand, prejudice against obesity may cause or contribute to the emotional and relationship problems. A recent article in the July 2007 Psychology Bulletin reviews research on bias against obese children. According to co-author Puhl, "the quality of life for kids who are obese is comparable to the quality of life of kids who have cancer. These kids are facing stigma from everywhere they look in society, whether it's media, school or at home." The stigmatization begins as early as age 3.[21] Stress has also been identified as a contributing factor to obesity.

Further evidence of the emotional roots to obesity was uncovered recently by Harvard Medical School. Researchers found that frequent binge eating, defined as bouts of uncontrolled eating well past the point of being full, is the most common of all eating disorders and a contributing factor to obesity,[22] Studies have shown greater psychopathology, in particular depression, among binge eaters.[23] Men with binge-eating disorder are also more likely to be substance abusers. In general, those who suffer from binge eating are more likely to be involved with other substance abuse problems, depression, panic attacks, anxiety disorders, and other serious psychiatric conditions. Binge eaters are generally referred to psychologists for treatment.

Therapists working with the emotional dimension of obesity see themselves as going to the root of the problem rather than engaging in symptom management. Overeating is seen as a response to emotions that individuals refuse to acknowledge. Just as depression is seen as anger turned inward, emotional eating involves stuffing down, silencing, or "medicating" the emotions with food. Those working from the emotional perspective encourage the client to become aware of the emotions that drive the eating behavior, explore the stories of the emotions, and work to befriend and then heal the emotions. Once this is achieved, there is no longer a need to silence emotions with food and behavior can be unlearned.

Spiritual Factors – Some mental health practitioners maintain that obesity can also stem from, and be addressed through, the spiritual dimension of existence. It is important here not to confuse spirituality and religion. "Spirit" is one of the four levels of wisdom of the human experience – mind, heart, body, and spirit. Religion is a set of beliefs, doctrine, and accompanying bureaucracy that may or may not address the individual spirit. Two schools of psychology which include the role of the spirit or soul in addressing dysfunction are Jungian Psychology and Transpersonal Psychology.

Hawaii-based therapist and author Anita Johnston is an international authority on the spiritual dimension of eating disorders. She points us to the hidden hungers and imbalances of our lives that fuel eating disorders such as obesity and describes eating disorders as messengers of the soul[24] Carl Jung, father of Jungian Psychology[25] cautions us that *"If you get rid of the pain before you have answered its questions, you get rid of the self along with it."* A whole person perspective on obesity argues that the obese person must recognize this spiritual level of wisdom and discover and respond to the question it asks or message it offers.

When Johnston asks obese clients to explore at the deepest level the message of the obesity, she hears them speak of relationships that are toxic, fear of making changes that need to be made, lives unlived, and rejection of their bodies (especially common with females). Often the message from the soul is that they are failing to take steps to create a life that is authentic and filled with purpose and meaning. Johnston suggests that obesity, rather than an enemy, can be seen as an important messenger, not a problem but a creative solution to the constant pressure to conform to a way of being in the world that is in direct contradiction to their inherent nature. From this perspective, struggles with food become symbolic, a message from the deepest, spiritual part of ourselves.

What Works and What Doesn't – Or Do We Know??

Individual Approaches – Adults

This section discusses the status of understanding and researching the various individual approaches to obesity treatment. Addressed first are approaches targeted toward adults and then those targeted toward children.

Self Help/Support Group Efforts.

The oldest and most frequently used approach to obesity relies on individual motivation. Self help books describe what to do and why it works. Support groups are designed to help people follow through with their personal commitment to change.

Self-Help Books and Diets

Self-help programs are the least expensive, least intrusive, and most frequently practiced dieting approach. They are dependent on the initiative of the individual and do not involve medical intervention. They include diet books, self-help programs, online programs, and commercial programs. Self-help books and diets offer a wide range of approaches, often with faulty and unproven assumptions and theories. Some of the most popular are the Atkins Diet, Dean Ornish Diet, South Beach Diet, Eat Right 4 Your Type, and Pritikin diets. These diets are based on assumptions about the relationship between weight gain and glycemic index, high protein intake, low protein intake, low carbohydrate intake, or high carbohydrate intake, an individual's blood type or metabolic rate. These assumptions are generally controversial. Ardent advocates cite various scientific theories and sources to defend their approach.

There are also meal replacement diets which usually have a powder to be added to low-fat milk or water or come as single-serving cans/shakes and diet/nutrient bars. All are fortified with nutrients, are designed to be filling, and have reduced calories. Prepared low calorie meals are also available for those who devise their own self-help diet plan.

Research – Recent research compared the following diets: the Atkins (very low in carbohydrate), Zone (low in carbohydrate), LEARN (Lifestyle, Exercise, Attitudes, Relationships, and Nutrition; low in fat, high in carbohydrate, based on national guidelines), and Ornish (high in carbohydrate). The study found that overweight women who were assigned to follow the Atkins diet for one year lost more weight than women who were assigned to the other diets. Participants received weekly instruction for two months, then an additional 10-month follow-up. Average 12-month weight loss was 10.4 lbs for Atkins, 3.5 lbs. for Zone, 5.7 lbs. for LEARN, and 4.8 lbs. for

Ornish. This study does not address long term results such as weight regained or the long term health problems of consistently eating fatty foods (Atkins).

It also needs to be noted that the results are only for one year, the diet doesn't look at other lifestyle factors, and may not apply to men or older women since none were studied.[26] While the Atkins diet fares well in this study, it has been less successful in other studies. In general, there is no solid research that the assumptions the diet books are based on are accurate, that the diets work, or that the meal replacement options are successful. A short-coming of all these approaches is that they are not comprehensive. They do not teach long-term healthy eating habits, address behavioral and psychological issues, address the need for physical activity, or guide the dieter to necessary lifestyle changes. They address only the symptoms, not the root causes of obesity and, products can become expensive.

Online Diet Programs.

A relatively new approach to dieting are online diet programs. These generally involve membership and promise that the plan is both easy and successful. Many promote or sell products and/or food and some offer recipes. Most encourage some physical activity and some offer an online personal trainer. Many offer some sort of ongoing phone support or online mentors. Healthy Success Online is an example. It offers a calorie-burning calculator tool to determine how many calories are burned with which activities, a record-keeping checkbook, healthy shake food substitute products, and a support group with weekly phone calls. eDiets is another example and shows the flexibility of a computerized approach. It has an initial diet profile that the customer fills out which allows for an individualized diet plan. This plan factors in the needs and desires of vegetarians, diabetics, and fitness oriented clients. The program sets up a daily calorie plan and offers a menu plan as well as a shopping list for the plan. There are also discussion forums, a recipe club, a support team that includes fitness experts and nutritionists. A newsletter offers articles of interest. Finally, there is an online store which sells food supplements, books and videos as well as exercise equipment (see www.ediets.com).

Research – Two studies addressing online diets were presented at the North American Association for the Study of Obesity's annual meeting in 2005. One study focused on weight loss and the other on weight loss maintenance. The weight loss study involved 450 overweight U.S. Air Force personnel. Half of the participants were men; all were overweight (but not obese) with an average age of 33 years. All participated in a typical weight loss method designed by the Air Force. In addition, a group of these participants added a 24-week Internet weight loss

program to their regimen for the study. The Internet program included a self-help book and two motivational phone calls. Those involved with the additional internet program were more likely to lose at least 5% of their body weight The weight maintenance study tracked 314 people who had recently lost at least 10% of their body weight. Participants had lost an average of 44 pounds. They were followed for the next 18 months. Participants were randomly assigned to get support in person, over the Internet, or from a newsletter. The Internet and in-person plans were identical, except for how their meetings were conducted. All of the groups experienced some weight regain. The amounts were 2.5 pounds for the face-to-face group, six pounds for the Internet group, and about 10 pounds for the newsletter group. While the in-person group fared the best, the relative success of the internet group supports this approach to dieting.[27]

Support Group, Commercial Programs.

Several support group oriented programs are available in communities around the country. TOPS (Take Off Pounds Sensibly) and Overeaters Anonymous both meet weekly and are free or have a minimal charge. There is no long-term research to support either of these programs. Weight Watchers is the leading commercial program and the only one that can provide long-term data to support its success.

Research – Weight Watchers vs. Self Help: A two-year study comparing dieters assigned to follow the Weight Watchers plan with those assigned to a self-help plan found that, at every point during the study, weight loss in the commercial group was greater than that of the self-help group. And by the end of the study, dieters who followed Weight Watchers lost significantly more weight than those in the self-help group. The most successful dieters are those Weight Watchers participants who continue to attend group meetings. Another study reported on by the same authors randomly assigned participants to a self-directed weight loss program that included two meetings with a dietitian or to a Weight Watchers program. Results showed that the self-directed dieters lost an average of 2.5% in six months compared to the Weight Watchers' participants who lost an average of 6% in six months.[28]

Weight Watchers for Children: One of the complaints about the other self help and commercial plans is that they are directed to adults only. Weight Watchers has adapted and researched their program for children and adolescents. Research on 55 obese Swedish children enrolled in either a 16-week physical training program or a pediatric-adapted Weight Watchers program found that the Weight Watchers' participants were significantly slimmer than the physical group, although the dropout rate for the latter was problematic. The higher compliance rate for Weight Watchers was notable.[29]

Weight Watchers vs. Exercise Only: A study of 58 overweight subjects were randomly assigned, half to Weight Watchers and half to an exercise only (EO) group. At the end of 12 weeks, the Weight Watchers group had greater improvements in body weight and fitness. The EO group neither lost weight nor improved fitness levels. It is hypothesized that better compliance to the comprehensive Weight Watchers method may account for the results.[30]

Among all weight loss programs, Weight Watchers is the best researched and found to be the most effective. Even so, research shows that participants lose approximately 10 lbs during the program and gain back 5 lbs over a follow-up two-year period. This would suggest that it might be a helpful preventative measure but would be ineffective in responding to obesity.

Sticking to the Diet: Another recent study reported in JAMA assigned groups of 40 overweight individuals to follow the Atkins, Dean Ornish, Weight Watchers or Zone diets. At the one-year mark, 25% of participants who stuck to their diet lost more than 5% of their body weight regardless of which plan they followed. There is no correspondence between the weight a person loses and the plan he or she is on. What does make a difference across the board is whether or not individuals stick to their plan. Those on Weight Watchers and The Zone plans were likelier to stick with their plan long-term. It seems that ultimately it is sticking to a diet rather than the type of plan that matters most.[31]

Vegetarian Diet: It is possible that a vegetarian diet can play an important role in losing weight without increasing exercise or reducing portion size. A review of 87 studies found that vegetarians were generally slimmer than meat eaters and were less likely to experience diseases related to obesity such as diabetes, high blood pressure, and heart disease. According to the researchers, a low-fat vegan diet led to loss of about one pound per week and the weight loss was maintained. One of the researchers, Neal Barnard described how a vegan diet can play a role in changing the way that the body absorbs nutrients and converts them into heat rather than fat. “There is evidence that a vegan diet causes an increased calorie burn after meals, meaning plant-based foods are being used more efficiently as fuel for the body, as opposed to being stored as fat.”[32]

Comprehensive Plan: Self-reported data from the National Weight Control Registry, a database of more than 5,000 people who have lost 30 pounds or more and have kept if off for more than a year, highlighted four types of behavior common to the “successful losers.” These included (1) eating a low-fat, high-carbohydrate diet; (2) eating breakfast almost every day; (3) frequent self-monitoring of weight; and (4) participation in a high level of

physical activity (60-90 minutes per day). Most subjects in the National Weight Control Registry are white women; men comprise only 20% of participants, and few minorities are represented. Most subjects are aged 44 to 49 years.[33]

A final pilot project involving not only a comprehensive plan but one which incorporates the values of a particular ethnic group was done here in Hawaii. Dr. Terry Shintani and the staff of the Waianae Coast Comprehensive Health Center conducted the Waianae Diet Program involving a 21 day plan addressing dietary and lifestyle change. This program involved feeding an ad libitum, whole-meal diet based on the traditional foods of the Hawaiian people. The program tried to approximate the social and cultural experience of traditional Hawaiian eating and cooking as well. Cultural and health education sessions were part of the dinner portion of the program. The results of this program are the only ones that we have discovered to show success at not only losing weight but also keeping it off. Follow up research from 12 to 60 months after completion of the program was conducted. Eight-two of the original 173 people who completed the program were available for follow up. Of these 82 participants, 67% had continued to lose weight and 33% had either maintained the weight loss at the same level or regained weight. Since regaining weight is perhaps the single greatest challenge of diet programs, these figures are significant. [34]

Summary of Self Help/Support Group Programs – The most important criteria in the success of diet programs are:

* Follow-through: Regardless of the diet, if dieters stick to it they will be more successful. But the dropout rate is high for dieters in general. Although no research exists separating those who are obese, one could expect that the challenges they face with the low rate of weight loss would be formidable and the dropout rate would be even higher.

* A vegetarian or vegan diet seems to be supported by research in losing weight and maintaining weight loss.

* Ongoing support appears to be a critical factor in achieving follow-through whether on the internet or at regular weekly meetings.

* Comprehensive plan: Those who create a comprehensive plan and are self initiated seem to do well.

The question remains why most people are unwilling or unable to engage in the above process. Is there something driving their behavior, the root cause, that is not reached by these plans?

Behavioral Therapy Programs

Behavioral therapy programs seek to go below the surface to a deeper level of motivation to achieve behavior change. Many of the components of behavioral programs were designed in university clinics in the late 1960s and continue to be the most thoroughly researched. These programs are based on the assumptions that behaviors that lead to obesity were learned and can be unlearned. They rely on Cognitive Behavioral Therapy addressing the influence of the mind and the dieters' thoughts on their behavior.[35]

Over the last 45 years, these programs have been refined, have become longer (averaging 26 weeks), involve more specific goals, and include key behavioral components such as problem solving, strategies for addressing stimulants to eating, self monitoring, and relapse prevention. These programs have also been extensively researched and show an average weight loss of 10%.[36] Unfortunately, studies show that this weight loss is not maintained. On average, within a year, participants regain more than one-third of their initial weight loss.[37]

Research – Diet. The earliest approach to weight loss using behavioral therapy involved stringent dietary restriction. Early research in 1994 on the effects of a very low-calorie diet or (VLCD) found that participants lost an average of 44 lbs over 12 weeks. Two problems occurred with this plan, however. Because of the health risks, they were required to participate in medical monitoring which turned out to be rather expensive. Also, research showed that they rapidly regained their weight after terminating the plan.[38] Some success was found in simplifying the diet by providing at least some of the food to the participants.[39]

Physical Activity: The physical activity component of behavioral programs has also been extensively studied. Three studies cited by the National Heart, Lung and Blood Institute (NHLBI)[40] found the combination of diet plus exercise produced a long -term weight loss of 3.3 – 6.6 lbs greater than that found in programs involving only diet or exercise. Other studies looked at the relative advantage of a home-based or clinic-based exercise program. They found that weight loss was significantly greater for the home-based group and members of this group were less likely to drop out of the plan.[41]

Developing an exercise program involving multiple short bouts such as four 10 -minute sessions was also found to have more positive outcome in long-term weight loss maintenance. The greatest outcome resulted with the short-bout group where participants were also given exercise equipment to use at home.[42] Assigning a trainer and paying for attendance at group sessions did not improve the outcome over that found with short-bout exercise assignments on exercise equipment to be used at home.

Because cognitive behavior therapy does not work with the emotional source of obesity, this approach misses what may be an important root cause of many women's lack of success with physical activity plans, according to Francie White, a researcher in the field of eating disorders for women. White has identified what she calls "exercise resistance syndrome." This syndrome is common among women in general but can also be found at high rates with women with eating disorders. It seems to stem from early socialization of girls in which they increasingly become aware of how the female body is objectified and they witness their bodies as visual objects for others. They hear family members and adults talk about their developing bodies. This causes an unconscious desire to hide their bodies which results in restricting their movements and vigorous physical activity. Many women begin to overeat and cease physical activity as a defense against this unwanted sexual attention.[43]

There may also be gender differences in the psychological impact of physical activity which can affect the path toward obesity for women. A study presented at the 2002 American Psychological Association annual convention reported that, for women with eating disorders, exercise does not produce a feel-good impact. For the men as a group, they found statistically significant associations between exercise and almost every measure of psychological health. For the women, however, most of those associations were either weak or statistically insignificant.

For women who had an eating disorder, exercise was related to negative affect and there was a slight trend for more depression and more anxiety. One possible explanation may be that men and women exercise for different reasons with societal pressures causing women to worry more about body image rather than just feeling good or having fun.[44]

Increasing Motivation: An important part of the work done by the behavioral approach to weight loss is to provide appropriate motivation to continue until the goal is achieved. This is especially important when focusing on maintaining the weight lost which is the most substantial problem with weight loss programs.

One approach to improving motivation which was studied involved an initial motivational interview for those with Type 2 diabetes. The interview helped participants explore their personal goals, examine discrepancies between their behavior and achieving the goals, and finally, acknowledged and worked with the participants' ambivalence. This approach did not result in greater weight loss but it did result in greater involvement in the treatment program including greater control of blood sugar levels.[45]

Another approach to improving motivation involved trying to increase satisfaction with the weight loss that was achieved. This is important because most people who enter weight loss programs expect to lose more weight than they actually do. This could be especially discouraging for obese participants. The program that was researched approached this by focusing on appearance and better health rather than simply weight loss. Both participants who were in an appearance-focused group and those who were in a health improvement-focused group lost more weight and expressed greater satisfaction than others in a standard behavioral program. Long term maintenance of the weight loss is still being studied.[46]

A final research effort designed to maximize motivation involved a study of social support. Two types of social support were studied. One involved working with a group of friends who were recruited to participate in a weight loss program and one involved participation in a group of strangers. Researchers found the best results were with the group working with friends. Of those working with friends, 66% maintained their weight loss over a six-month follow-up compared to 24% of those working with strangers.[47]

Summary of Behavioral Therapy Approaches – The behavioral therapy approach to weight loss is the most extensively studied and shows the following:

- Exercise and diet are more effective than either alone although exercise plays a much smaller role than diet.
- Structured meal plans and meal supplements are more effective than self help calorie-counting.
- Exercise involving short-bouts, at least initially, exercising at home on home-based exercise equipment is the most successful approach to exercise.
- Participants are more motivated by working with friends who share their commitment to lose weight and participate with them.
- Focus on health and appearance is more effective in achieving weight loss satisfaction than focusing on loss of weight.
- Weight regain is the most common outcome of long-term dieting.

Perhaps the lack of success of the behavioral therapy approach to obesity is its exclusive focus on the mental and physical dimensions of obesity. Although this approach goes deeper than the self help plans, it still ignores the emotional and spiritual aspects of the human and experience and how they might influence obesity. The non-dieting movement recognizes this and addresses the emotions related to current approaches to obesity. This

movement points out the failure of dieting programs, challenges the assumptions they operate from, points to damage done by the weight loss programs, and shifts the discussion away from losing weight to self esteem.

Non-dieting – Non-dieting programs have grown during the last decade or so. Their motivation has been to address the emotional damage that comes from fat prejudice and from the ineffectiveness of dieting programs. Instead, they focus on developing positive self esteem, a positive relationship with and attitude toward the body, and a shift in perception of food. They shift the paradigm from "body as enemy" to "body as friend" and "food as enemy" to "enjoying and savoring food". Emotional well-being is a major focus of their efforts.

This growing movement is based on three basic assumptions: First, they argue that dieting is ineffective. It is well-established that diets are not successful in producing their most desired outcome – long-term weight loss.

Second, non-diet programs also see dieting as emotionally and physically harmful. Researchers have shown that dieting can result in depression, anxiety, irritability, anger, food and weight preoccupation, diminished self-esteem, social isolation, and diminished body image.[48]

Third, dieting has been shown in some studies to contribute to hypertension, dizziness, hair loss, reduced metabolic rate, and decreased bone mass.[49]

Finally, the non-diet movement argues that the fundamental assumptions about the causes of excessive weight are inaccurate. Rather than a belief that it is simply a result of an unhealthy differential between calories in and calories out or inappropriate eating habits, they point to genetic and biological causes.

The components of non-dieting programs generally include discussion of the ill effects of dieting, the biological basis of body weight, changing one's relationship with food, increasing physical activity, and improving psychological wellbeing.

Research on these programs has shown that they do improve self-esteem, body image, and mood. However, there is little improvement in body weight. Clearly, something continues to be missing in the response to obesity. The non-dieting movement addresses the emotional fallout of being obese rather than the emotional roots of obesity and it identifies the root source of obesity as biology. Again, there is a failure to identify and address obesity from a whole person perspective.

Medications

The use of medications or drugs to suppress appetite and address obesity is based on the assumption that obesity is a chronic disease like hypertension. When drugs are taken as directed, they can be an effective response. However, when they are no longer used, the disease usually returns.

The history of the use of drugs to respond to obesity has been fraught with problems due to side effects. For example, while amphetamines have been used in drugs to suppress appetite, they have addictive properties which can create a different problem – addiction. More recently, valvular heart disease has been associated with the use of diet drugs.[50],[51]

Over-the-counter

Most over-the-counter weight loss medicines consist of appetite suppressants, many in the form of herbal supplements. As with most prescription weight loss drugs, weight loss occurs mostly while you are taking the medicine unless other behavioral changes such as improved diet and increased exercise are made. Recently the FDA approved the first and only over-the-counter weight loss pill, Alli, which was released in Summer 2007.

Since dietary supplements and weight loss aids are not subjected to the same rigorous standards as prescription drugs, the evidence regarding the effectiveness and safety of these products is not very convincing. The following is a list of some of the most common weight loss aids and their reported claims:[52]

- **Alli (orlistat)** – An over-the-counter version of a prescription drug, Xenical, which has been sold in the United States since 1999. This drug blocks the breakdown and absorption of fat in the intestine and has several unpleasant side effects such as diarrhea and oily stools. It is intended for use by those 18 years of age and older.
- **Ephedra (plus caffeine)** – boosts metabolism and decreases appetite; ephedra can cause dangerous side effects, including heart attacks and stroke; should not be taken by people with heart disease, high blood pressure, thyroid disease, diabetes or an enlarged prostate. Dietary supplements that contain ephedra have been banned in the United States since April 2004 due to risk of illness and injury. However, despite the ban, several products containing ephedra are sold over the Internet and it may be found in tea.
- **Bitter orange** – known as "ephedra substitute" decreases appetite.
- **St. John's Wort** – commonly used as an anti-depressant and combined with ephedra are the two primary ingredients in herbal phen-fen. Potentially very dangerous if used as a weight loss aid.

- **Chitosan** – blocks the absorption of dietary fat.
- **Chromium** – reduces body fat, builds muscle, and lowers blood sugar levels.
- **Benzocaine gum** – alters taste and numbs the mouth.
- **Guar Gum** – blocks the absorption of fat and creates a feeling of fullness. The water-retaining capacity of the gum can cause it to swell 10- to 20-fold and can led to gastrointestinal obstructions.
- **Cascara** – one of the few herbs approved as an over-the-counter drug by the FDA, it is a strong stimulant laxative.
- **Green tea extract** – increases fat metabolism and decreases appetite.
- **Glucomannan** – decreases appetite and food absorption.
- **Phenylpropanolamine (PPA)** – The Food and Drug Administration (FDA) is currently taking steps to remove phenylpropanolamine (PPA), a common ingredient in many over-the-counter weight loss medications, from drug products and has requested that drug companies discontinue marketing products containing PPA. Although PPA suppresses appetite, studies have shown that it increases the risk of hemorrhagic stroke (bleeding into the brain or into tissue surrounding the brain) in women.

Prescription Medication

Following are some of the prescription drugs being used to address obesity. [53]

- "Sibutramine – boosts metabolism, enhances energy level, and promotes a feeling of fullness. Studies have found it to be effective for weight loss but side effects include dry mouth, asthenia, constipation, and insomnia. It cannot be taken by people with a history of stroke, seizures, or heart, liver, or kidney diseases. Because of its side effects, this drug needs to be carefully monitored.
- Orlistat –reduces the absorption of fat from foods causing weight loss. Because it also reduces absorption of essential fat-soluble vitamins (A, D, E, and K) it should not be used by people with a history of kidney stones. Studies on this drug have shown that people can regain up to one-third of their lost weight over a two-year period even when continuing to use orlistat.[54]
- Phentermine – suppresses appetite. Serious potential side effects include pulmonary hypertension and heart valve defects. These conditions are much more likely to occur when used in combination with fenfluramine, also known as fen-phen. Fortunately, medications containing fenfluramine have been

removed from the market. Phentermine should not be used with SSRI and MAOI antidepressant medications.

- Amphetamine derivatives (benzphetamine, diethylpropion, phendimetrazine, and mazindol) – elevate mood and reduce weight moderately over the short-term (three to 12 weeks). They can cause addiction, agitation, and insomnia. Consequently, the use of these medications is not recommended.

Other: Ayurveda –Guggal (*Commiphora mukal*) is a common ingredient found in several Ayurvedic medicines used to treat obesity. There is some evidence that overweight individuals who receive these guggal-containing Ayurvedic remedies lose a significant amount of weight compared to those who do not receive such medicines. These Ayurvedic remedies also caused substantial decreases in cholesterol. Minor side effects associated with guggal-containing preparations include mild diarrhea and nausea. Extensive studies have not been conducted, however.[55]

Summary of Medications

NHLBI and NIH guidelines recommend that use of pharmacotherapy should be closely monitored for side effects. Using drugs as a treatment for obesity has been criticized because when they are not used, the weight is regained. In some cases, as with orlistat, weight is regained even when the drug continues to be used. Prescription drugs have side effects, are not sufficiently researched, and require close monitoring which adds to the expense. Because the use of drugs does not address lifestyle and emotional issues, they are limited in their scope and effectiveness.

Bariatric Surgery

Surgery to correct obesity dates back five decades. The earliest approaches to surgery resulted in serious complications including liver failure. Refinements have centered on the following three types of surgery – gastric bypass, gastroplasty, and gastric banding. Bariatric surgery for adults has soared from 772 in 1998 to 177,000 Americans in 2006. Bariatric surgery is increasing for young people as well. Only 350 U.S. children had such an operation in 2004, but that increased to 1,000 by 2006. A group of four hospitals, led by Cincinnati Children's Hospital Medical Center, started a large-scale study in the spring of 2007 examining how children respond to various types of weight-loss surgery, including the gastric bypass, in which a pouch is stapled off from the rest of the stomach and connected to the small intestine. The Food and Drug Administration is also testing how adolescents benefit from the laparoscopic gastric banding surgical procedure.[56]

Bariatric surgery can have dramatic and long-term results with extremely obese participants losing an average of two-thirds of their excess weight within 1-2 years. Long-term follow-up research shows success with maintaining the weight loss. There are complications, however, which should cause the use of surgery to be done only when other attempts have failed. Early complications such as internal leakage from the surgery and staple line disruption are well discussed in the medical literature. Late complications include developing an internal hernia or an incisional hernia.[57],[58] Further, extremely obese patients frequently require abdominoplasty with complications running as high as 55% according to research done in the late 1990's. The success rate can be enhanced by the experience of the physician, however.[59],[60] Gastrointestinal problems can also result from bariatric surgery.[61] Many patients need body-contouring surgery to address loose flesh after the weight loss. Finally, nutritional complications can occur. These include protein calorie malnutrition, vitamin B12 deficiency, iron deficiency anemia with menstruating women, magnesium and calcium deficiencies.

The U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality (AHRQ) follow-up research for adults found a 40% complication rate which included vomiting, reflux, and diarrhea (nearly 20%); anastomosis complications (complications resulting from the surgical joining of the intestine and stomach) such as leaks or strictures (12%); abdominal hernias (7%); infections (6%). Bariatric surgery is considered a failure if the patient does not lose at least 40% of excess weight. An estimated 10%-15% of patients either fail to lose the weight or regain it.[62] Re-operation is considered highly risky.

Positive outcomes include dramatic weight loss as well as reduction of many of the co-morbidity factors such as hypertension, sleep apnea, heart problems, etc.[63][64][65] Surgery has also been shown to correct non-insulin dependent diabetes.[66]

Because of the growing popularity of bariatric surgery, extensive research is being done by the Longitudinal Assessment of Bariatric Surgery, a National Institutes of Health (NIH)-funded consortium of six clinical centers and a data coordinating center working in cooperation with NIH scientific staff. In March 2005, they began conducting research on all aspects of bariatric surgery including clinical, epidemiological, and behavioral research.

Summary of Bariatric Surgery – Bariatric surgery can be a blessing for extremely obese individuals but it should be used with caution as extensive research continues. The NHLBI, NIH Government Guidelines recommend that this surgery be done only with patients who have unsuccessfully tried other approaches to weight loss and are suffering from complications of extreme obesity.[67]

Some of the reasons for caution include**:**

- Lack of Long-term Research: As noted above, there is little or no research on young people and only limited long-term research on adults.
- Expense: The average cost of bariatric surgery is $25,000 without complications. It goes to $36,542 with complications and $65,031 if the patient must be readmitted to the hospital.
- Post Bariatric Cosmetic Surgery: Called "body contouring", this surgery seeks to address the unsightly excess folds of skin and fat that bariatric surgery leaves. Unless addressed, this can sometimes leave the patient looking worse rather than better.
- Not Comprehensive: Bariatric surgery has seldom been accompanied by counseling on lifestyle, nutrition, and behavior changes. Life-long follow-up is recommended including social and psychological support.
- Seen as a Quick Fix: Too often bariatric surgery is seen as a quick fix to the obesity problem.

Individual Causal Factors – Children.

A substantial amount of work has been done in exploring the causes of childhood obesity. One of the critical questions that has been addressed is whether there are early predictors in childhood of which children will experience adult obesity. Will the child outgrow his/her "baby fat?" Research conducted in the 1980s found that infants with a BMI over the 75th percentile were twice as likely to become obese adults as those with a BMI in the 25th percentile.[68] Others determined that over half of children with a high BMI before age seven years went on to become obese adults.[69]

Obese Parent Because of the strong role that parenting and genetics have on children, researchers also looked at the predictive influence on children of having an obese parent. Up to age 10 years, having an overweight parent did correlate to the likelihood that an overweight child would experience adult obesity. Beyond 10 years of age, however, it seems that the influence of parental obesity declines. The primary factor at that point is whether the child is overweight, regardless of the weight status of the parent. If the child is overweight at that age he/she is likely to continue with weight gain. Thus, there is a particular need to address overweight children before they reach age 10 years.[70]

Role of Early Feeding There have also been questions of whether breast or formula feeding has an impact on a child's long-term weight. No differences have been found.[71] Researchers also found no correlation between the age of introduction of solid food and development of obesity.[72] Contrary to commonsense, most researchers have also found no correlation between dietary fat intake and body fat in children nor does it seem to predict development of obesity.[73]

Parental Influence and Feeding Style Several other interesting factors do seem to be predictors of obesity development. One is the speed with which an infant and/or child eats. A "vigorous feeding style" such as rapid, high-pressure sucking while breast feeding as well as a rapid feeding style in childhood were both risk factors for becoming obese.[74] [75]

This may relate to findings showing that a food-deprived pregnant mother will increase the likelihood of an overweight child. A study of 741 women and men born during the famine in Amsterdam between 1943 and 1947 showed that the BMI of women exposed to prenatal malnutrition during the first trimester was greater than for those whose mothers' did not experience malnutrition. This did not apply to those with mothers who experienced malnutrition during the second and third trimester of the pregnancy. No differences were found for men.[76] This would suggest that a woman should not diet during early stages of her pregnancy and that early intervention with pregnant mothers is important.

A third parental factor in influencing childhood obesity is whether or not the parents pressure the child to clean their plate.. Researchers found that infants and children have a natural ability to regulate their food intake to be appropriate to their energy needs.[77] If parents interfered with that by urging the child to clean his/her plate or actively encourage eating, the child was more likely to become overweight.[78] The conclusion was that either rewarding a child with food or prompting them to eat had the effect of overriding the natural tendency to self-regulate.

Also, researchers found that girls, not boys, had greater body fat if their parents tried to exert more control over their eating. Trying to restrict the child from preferred, often unhealthy, foods often had the opposite effect, especially in girls.[79]

Family Environment A study by researchers at Arizona State University demonstrated the importance of the home environment on a child becoming obese. Children who grew up in families with unhealthy eating habits such as skipping breakfast, not eating meals together, and leading a sedentary, couch potato lifestyle were 33% more

likely to become obese as young adults. The study also found that children did not need to substitute high levels of physical activity for the sedentary lifestyle. Instead, engaging in non-athletic activities such as doing housework, having a part-time job, involvement with school activities was sufficient to reduce the likelihood of becoming obese.

Another interesting finding of the research was that the stronger the emotional bond between child and parent, the more likely the child will be overweight. They speculate that some of this may be due to overeating as a result of separation anxiety or parents not wanting to alienate the child by criticizing their eating habits.

Finally, the researchers found no difference between children of single parent and two parent families, step-parent households, or race or ethnic backgrounds. This research suggests that prevention needs to begin in the home and involve the family.[80]

Studies of the family environment also have looked at television watching. In a national study of 745 children ages 10-15, the odds of becoming overweight were 4.6 times greater for children watching more than five hours of television compared to children watching no more than two hours a day.[81]

Emotional Factors

Some have speculated that obesity stems from childhood sexual abuse, that the obese woman or child uses her obesity as armor against sexual abuse. Others have suggested that the anorexic girl sees her anorexia as the ultimate means of control in a family where she has no control and may be experiencing sexual abuse. Most research looking at a link between sexual abuse in childhood and obesity or eating disorders has been unclear, however. New research has found that the link does occur but is somewhat complex. Childhood sexual abuse is not a significant risk factor on its own but, when combined with psychological distress such as depression and anxiety, it can be a contributing factor to obesity. Researchers Anita Hund and Dorothy Espelage found that the key seemed to be how the child experienced emotions. Thus, going to the root of the problem – a combination of a history of sexual abuse, how that experience is processed emotionally – and current stressors, can help obese persons overcome their eating disorder.[82]

Individual Approaches – Children

Diet/Weight Loss Programs

The most successful of the dietary programs for children is the "traffic-light diet". It guides children to develop a healthy diet based on groups of foods that have been assigned a color relating to the level of dietary fat and sugars. Foods in the green category are "go," yellow category "caution," and red category "stop." Programs using this

approach have achieved a significant decrease in obesity, improvement in nutrient density, and improved eating patterns.[83] The program has a long-term effect and produces a greater preference for healthy foods for children participating in it than for comparable lean children.[84] The big challenge of weight maintenance also seems to be overcome with this approach. Follow-up research shows long-term weight reduction for up to 10 years with those participating in the traffic-light diet, combined with behavioral, exercise, and family treatment components.[85]

Physical Activity

While exercise has been shown to have no significant impact alone for either adults or children, increased physical activity for children can help in a weight reduction program when combined with diet and behavior change programs. Several studies have shown that the most effective approach to physical activity is to engage young people in lifestyle activities to reduce sedentary time rather than put them through aerobic or other exercise programs.[86] Interestingly, offering children incentives for reducing their sedentary time was the most effective approach to reducing weight through increased activity. At a 12-month follow-up, they had still maintained their weight loss.[87]

Behavior/Weight Loss Programs

Behavior change for childhood obesity was first introduced over 20 years ago. Over the years it has evolved to include nutrition education, goal setting, contingency contracting, self-monitoring techniques for calorie intake and weight control, rewards, etc. Because of the substantial findings of a series of studies over the last two decades showing positive results, behavior change for childhood obesity has become standard for successful programs.[88]

Research over the last two decades has also shown the value of including parents. With 10-year follow-up, the programs involving parent-child groups had the best weight loss maintenance.[89] Studies have even shown that obese children can be effectively treated even if they are not actively participating in treatment as long as parents are actively engaged. The findings are not as strong when applied to adolescents. One study showed that weight loss was more effective when the parent and child were in separate groups, at least for Caucasian children.[90] With African American families, however, treating the mother and adolescent child separately did not improve the outcome.[91]

Motivational Interviewing

Only two studies have been identified that looked at motivational interviewing as an intervention in pediatric obesity. The first was the Healthy Lifestyle Pilot Study which focused on the prevention of overweight children

three to seven years old. This study did see positive results in terms of satisfaction with the counseling. Data is still not available on changes in participants' BMI. The second study was Go Girls, a multi-component intervention for African American adolescents 12 to 16 years old. Results indicated there was no association between change in BMI and number of motivational interviewing sessions.[92]

For both adults and children, the longer the treatment, the greater the pattern of change in obesity.[93]

Emotional Approach

As with the adults, the emotional source of obesity has been largely ignored by programs and researchers. C.T. O'Donnell II, president and CEO, KidsPeace is one person who criticizes what he calls "the startling little attention paid to the underlying emotional roots of the problem." In a commentary for the Foundation Center website, he argues that the link between stress and eating has long been clear. For children with trouble verbalizing their feelings or emotional state or those who experience stress or depression, overeating and overindulgence in high-fat foods are common responses. "Child psychiatrists, child development specialists, and charities that work with kids in crisis observe this phenomenon every day at a grassroots level, as an increasing number of kids are brought to our doors suffering from both emotional issues and the physical and social burdens of being overweight."[94]

Research sponsored by his organization and conducted by the Lee Salk Center for Research looked at 1,023 American children, nationwide, between the ages of ten and thirteen years. The survey found levels of stress and fears that substantially exceed those found in previous generations. They include:

- 54% fear they may contract AIDS.
- 40% of children as young as ten believe they may fall into the traps of early pregnancy, unwed parenthood, drugs, or alcohol.
- 45% fear they will be physically or sexually abused.
- 51% worry about their own deaths.
- 47% say they are afraid they might be unhappy in life.

This research did not include the fear resulting from 9/11, growing concern and public education about global warming, and increased levels of unemployment of their parents. An informal school-based survey on Oahu several years ago discovered that bankruptcy was one of the major fears of children and youth.

In response to O'Donnell's concern, KidsPeace has launched a teenage problem-solving website, www.TeenCentral.net, as well as a campaign to get kids and parents to fix and eat meals together. It is not so much what the child is eating but "what is eating the child," according to O'Donnell.

No emotionally-focused program or research was discovered for children.

Medications

There are a number of medications that can and have been used for children.

- Sibutramine – The addition of sibutramine in the treatment of adolescents with overweight within a multicomponent pediatric weight management program may be helpful in achieving short term (less than six months) reductions in weight and BMI. To date, no studies have been found using sibutramine in children less than 13 years of age. Longer term efficacy and safety have not been thoroughly addressed. The use of sibutramine to treat overweight is being studied in clinical trials, but it has not been approved by the FDA for pediatric use.[95]
- Orlistat was described earlier in the section addressing adults. Orlistat may be moderately effective in promoting improved adiposity (up to 12 months) as part of a comprehensive weight management program in adolescents. However, application is limited by the common gastrointestinal adverse events. Long-term efficacy and tolerability of orlistat as part of a comprehensive behavioral treatment program for adolescents has not been studied. Orlistat has not been studied in children younger than 12 years.[96]

Individual Approaches Conclusion

At this point, programs and efforts that address obesity as an individual vs environmental problem involve dieting, exercising, participating in support groups, and working with a cognitive behavioral psychologist. While there may be small successes for some individuals, overall, these programs have failed to help those who are already obese and have failed to stop the escalation of the rate of obesity. This is true for both children and adults. The obesity epidemic continues regardless of the growth of programs. It continues regardless of the emphasis on low fat food, strong bias toward thinness in the media, proliferation of health clubs, diet centers, low fat meals, etc.

Following are some observations about why success in addressing the problem of obesity from an individual perspective has been so elusive.

Lack of Whole Person Perspective vs. Symptom Management

Each of these approaches to the problem of obesity addresses obesity as a symptom to be managed. The medical approach even sees it as a chronic disease that can never truly be cured. None of them seek to address the root cause of the symptom. None of them look at the whole person and engage the mind, heart, body, and spirit in an exploration of the source of the obesity.

Directing Change from the Outside

The lack of overall success may also be due to the bias and attitude of those designing programs. Theories regarding the reason for and appropriate response to obesity are developed mostly in academic and medical environments. These theories then form the basis for programs. Obese clients are either assigned to the programs and/or given a choice which program to participate in. Thus, the approaches are directed from the outside, theoretical realm, rather than from the perspective and experience of the people who have the greatest wisdom regarding the nature and causes of obesity – the obese client. An integrative approach to healthcare recognizes that there is within each of us a push to achieve balance and health. Absence of health is a reflection of an imbalance somewhere in the system – mind, heart, body, and spirit. The individual client has the wisdom within their healing system to identify the root cause of the problem and pursue the appropriate path to returning to balance. We need to tap into and trust the inner wisdom of the individual client.

The approach that is currently being taken is similar to economic development approaches taken with developing world countries. Even though we now know better, most developmental "experts" continue to fit the perceived needs of the poorer country into the framework of understanding of the wealthy country. Thus, rather than becoming totally familiar with the target community, spending time listening to the elders, asking them how best to approach their economic and social challenges and waiting to be asked for assistance, development experts approach the exchange from a patriarchal perspective. They assume that the greater wisdom lies within the paradigm of the wealthy country, and they, the experts, are in the best position to decide what to do. The result is that poorer countries are getting poorer as wealth increasingly accumulates in the hands of a few individuals, mostly in developed countries. Our attempts to help only make things worse.

To truly have a positive impact, those involved with economic development must go to the place where they seek to work and be guided by the wisdom of the community in seeking solutions. Perhaps the same should be done with the problem of obesity.

Not Individualized

A final contributing factor to the lack of real success on the individual level is related to the above. Every person's path into and out of obesity is individual, unique, and complex but the attempts to help them have not been individualized. Even when extensive assessments are done, the clients are asked to answer many questions that will help the therapist or practitioner know which program to put them into. The questions are largely behavioral and rarely tap into the deeper wisdom that lies within each client waiting to be heard.

Environmental Problems

The battle against obesity has been no more successful than the war on drugs. Both continue to consume an inordinate amount of money and attention. Both have focused primarily on making changes within the individual. This suggests there may be a problem with both the philosophy and approach.

Some argue that this failure to successfully address the problem is related to a disproportionate focus on the individual and not enough attention to the larger picture, a toxic environment.[97]

As mentioned at the beginning of the article, there is substantial research that points to the proliferation of the American, western, modern lifestyle as a major culprit. Studies have shown that the likelihood of obesity grows with each succeeding immigrant generation living in the United States. What exactly is so toxic about the modern lifestyle and can something be done about it?

Unhealthy food

The toxic environment involves more processed, packaged, and high-calorie foods, increases in cheap, convenient, fattening "fast foods," greater portion sizes in restaurants, television programming promoting unhealthy foods, especially focused on children, a culture of reduced activity and increased TV watching, massive advertisement efforts focusing on consumption of unhealthy soft drinks, candies and snacks, and a greater percentage of meals eaten outside the home.

Those looking at the toxic environment perspective point to the increased availability of unhealthy foods in the schools. Fast food chains have worked their way into the schools and a survey of over 400 schools shows that pizza is the most popular food at 66% of the schools.[98]

"Portion distortion" is also contributing to the obesity epidemic. In 2002, Young and Nestle found that the average portion of a single serving of cooked pasta was 480% greater than the recommended serving size. Cookies were 700% larger. Soft drinks that once came in eight-ounce sizes are now 20 ounces. Comparing U.S. Food and Drug Administration and Department of Agriculture recommendations on portions with the portions provided by

fast-food chains and takeout or "family-type" restaurants, and with serving sizes recommended by manufacturers of foods sold in stores, the researchers found that both agencies' guidelines were largely ignored. In addition, they found that "the sizes of current marketplace foods almost universally exceed the sizes of those offered in the past." They concluded, "Educational and other public health efforts to address obesity should focus on the need for people to consume smaller portions."[99]

A major culprit is the soft drink industry. According to *Liquid Sugar*, a 2005 report by the nonprofit Center for Science in the Public Interest, carbonated soft drinks are the single largest source of calories in the American diet providing about 7% of calories; adding in non-carbonated soft drinks (including fruit drinks, ice teas, etc.) the figure increases to 9 %.[100] Soft drinks are a problem because they provide large amounts of refined sugar to one's diet and are a nutritional zero. Additionally, soft drinks displace healthier alternatives for children such as milk. A recent systemic review in the American Journal of Public Health showed a clear association between consumption of non-diet soft drinks and increased calorie intake and body weight.[101] On a positive note, soft drink consumption has been slightly decreasing since 1998; however, there is still a long way to go to reduce the 52.4 gallons per person that is presently consumed.[102]

There is also the matter of advertisements in the schools via Channel One. Channel One provides schools with VCRs, televisions, and satellite dishes in exchange for access to over eight million middle and high school children. The channel offers eight-minute programs on news and two minutes on advertising every 10 minutes. Research shows that nearly 70% of the commercials on this television station market fast food, soft drinks, gum, and candy.[103]

The western lifestyle also sees fewer and fewer families cooking and eating together in the home. Research indicates that children consume 85% of their meals out of the home at fast food restaurants.[104]

Stress

The U.S. Department of Labor Occupational Employment Statistics for 2004 estimates that 72 million Americans face a health risk at work based on stress. A results-driven working culture, pattern of downsizing by corporations, inadequate workforce to perform the workload expected and lack of control over their own work are contributing to a growing level of workplace stress.

The stress is not just related to work and social relationships but also reflects perceptions of a growing global crisis. The media is filled with stories of war, violence, fear of terrorism, global warming, destructive weather changes, and a threatened economic meltdown in the United States.

In addition, the growing gap between the “haves” and “have nots” has begun to affect the middle class. Lack of employment and financial security is reaching an ever greater percentage of the American people.

A National Health Interview Survey found that 75% of the general population experiences at least "some stress" every two weeks, and half of those people report feeling moderate or high levels of stress during that time period.

This same survey reports that tranquilizers, antidepressants, and anti-anxiety medications account for one fourth of all prescriptions written in the U.S. each year. Stress contributes to the development of alcoholism, obesity, suicide, drug addiction, cigarette addiction, and other harmful behaviors.[105]

Lack of Meaning

No research has been found that specifically looks at the ways in which our modern lifestyle contributes to a lack of deep, healing meaning in our lives. It takes little imagination, though, to make the link between a culture obsessed with consumption and a culture increasingly obese. Is our obesity epidemic a soul-level message that our values are out of place? Could it be that the obesity epidemic, during which growing numbers of people stuff themselves with unhealthy food to the point of obesity, is symbolic of a culture that drives individuals to stuff their lives with material goods to the extent that it is unhealthy for the planet, their pocketbooks, and their overall wellbeing?

First generation immigrants are committed to making deep sacrifices not only for the immediate family but also for family members back home. With each successive generation, that willingness to sacrifice gives way to a focus on individual achievement and consumption. And, with each successive generation, the rate of obesity grows.

Environmental Solutions

The need to pay attention to a toxic environment has not gone unnoticed by policy makers. Although there are increasing activities in this area, solid research has yet to be available. Following are some environmentally-focused activities and suggestions.

School Based Interventions

There has been a national movement to remove unhealthy foods and soft drinks from schools and replace them with healthy meals including fresh fruits and vegetables. The Child Nutrition and WIC Reauthorization Act of 2004 required schools to develop local wellness policies involving all community stakeholders by July 2006. According to the Health Policy Tracking Service, 21 states passed legislation on nutritional standards in schools in 2005 and nine state boards of education gave school districts new rules or recommendations. Leading school initiatives include setting nutritional standards, restricting sales of "competitive foods and beverages" (any food served outside the regular meal program), and banning or limiting vending machine sales for poor nutritional foods.[106] In 2004, Hawaii legislators passed a law requiring 80 percent of the drinks offered to students in vending machines at Hawaii's public schools to have healthy options such as water, milk, and fruit juice.

Some have taken on the Channel One school television program and sought to limit its advertisement of unhealthy foods. There is also a growing movement to create “edible schoolyards” where school children are involved in growing and cooking healthy foods.

Schools have been a major focus for environmental intervention. A review of school based interventions finds programs or policy decisions which are designed to respond to childhood obesity or to prevent it. They are generally multimodal and have focused on treating individual children or families as well as programs focused on schools. There are school-based interventions for treating overweight children and some prevention programs focused on entire communities engaged with the schools. School-based programs are quite diverse and include eating locations, homework/reading, media influences, multi-component programs, nutrition education (including nutritional visits to parents and educational curriculum), parental modeling, peer modeling, increased physical activity including competitive games, and decreased sedentary behaviors. A review of 45 programs from around the world can be found at the American Dietetic Associations’ website. (footnote) (http://www.adaevidencelibrary.com/content.cfm?content_code=contact:ada&auth=1).

None of the programs have been able to identify particular components which have contributed to changes in the rate of overweight and obesity, however.

Community Service

Private schools in Hawaii are particularly inclined to require that their students participate in a minimum amount of voluntary community service. This not only reinforces the value of serving others but also reduces the time available for watching television and other sedentary activities.

Extra Curriculum Activities

While pressures resulting from the No Child Left Behind federal program and inadequate school funding have left many schools with less time and fewer resources for extra curriculum activities, as a result of Title IX, the growth in girls' sports finds more young women participating in athletic activities than ever before. This emphasis should not be allowed to diminish and should include attention to boys. Music has been a major focus of extracurricular activities at such private schools as Kamehameha Schools. This can have a lifelong impact encouraging a healthy approach to life and healthy self esteem. A focus of research might be valuable comparing the obesity rate for children in public schools and in private schools.

Healthy Workplace

Although there are isolated examples of benefit programs for employees who take active steps to maintain their health, these are not widespread. Much could be done to engage employers and employees, including unions, in developing a healthier workplace that includes not just reducing easy access to soft drinks and snacks but also addresses stress.

Community Resources

There is a proliferation of programs, organizations, and activities in the community that are engaged in creating healthy lifestyles and healthy communities. They include such state initiatives as Sustainable 2050 and local initiatives such as the Active Living Community at Kokua Kalihi Valley. It would be valuable to develop an inventory of these programs and engage them in attempts to address obesity from an environmental perspective.

Statewide Plan

The Center for Disease Control and Prevention (CDC) has funded 23 states to develop state obesity prevention and response plans. It promotes a three-pronged approach to obesity planning: behavior change, environmental change, and policy change. The cooperative agreements between the CDC and funded states have the following goals: promote development and implementation of community nutrition and physical activity plans for obesity prevention and control; decrease levels of obesity or reduce the rates of growth of obesity in communities reached through interventions; increase physical activity and improve dietary behaviors in communities reached

through interventions; and increase interventions, policies, environmental supports and/or legislative actions for improved nutrition and physical activity. CDC has also come up with an evaluation tool for states to use in evaluating their plans.[107]

Hawaii has not received funding from the CDC to develop a plan. The Department of Health is in the final stages of developing a community nutrition and physical activity plan. This plan was a result of a mandate from the legislature in 2003. It is focused on primary prevention as it relates to physical activity and nutrition.

Summary

There is strong evidence that the environment is a root contributor to obesity. A wealth of possibilities exists for what can be done in Hawaii to address the environmental contributors to obesity. These possibilities go well beyond nutrition and physical activity. Many resources are already in place and others will surely reveal themselves with a systematic statewide inventory. Identifying, engaging, and creating resources in the community to address obesity will also, inevitably, create a healthy environment and citizenry.

Conclusion

Obesity is the primary health challenge facing not only the United States but also countries around the world. In spite of all that we are doing locally, statewide, nationally, and globally, the problem grows. One definition of insanity is the act of doing the same thing repeatedly while, each time, expecting a different outcome. It appears that our approach to preventing and resolving obesity is just that. While the individual approaches and programs help some of the people some of the time for a short period of time, for the most part they are unsuccessful. Most people are not reached and not helped. Too often they are emotionally injured through the personal experience of failure and the bias they encounter in programs or physically damaged by drug side effects. They continue to experience discrimination against obesity in the community and continue to suffer from health problems related to their obesity.

The individual approach consistently focuses on managing the symptoms rather than discovering the root cause of obesity. We impose our assumptions on individual clients rather than listening to their wisdom and crafting responses based on their unique needs. While the assumptions of these individual programs appear to be intuitive – calories in and calories out – research shows that not only do programs based on this perspective not work, but the assumptions themselves seem to be flawed. Although we buy more low-calorie food products and even reduce our calories, we do not achieve sustained weight loss and the problem of obesity grows.

An environmental understanding of the causes of obesity and potential changes that can enhance the health of all concerned has only begun to be explored. There are a number of activities and policy initiatives that are occurring to change the environment to one which is healthier overall and more likely to prevent obesity. Hawaii has just begun to look at some of these through the DOH physical activity and nutrition plan. Albert Einstein insisted that we cannot solve the problems we have created with the same thinking with which we created them. We need to engage in new thinking and a new approach which involves the whole person (mind, heart, body, and spirit), engages us in deep listening, and works with the total environment as well as the individual.

Hawaii has not yet developed a statewide plan for addressing obesity. Thus, it is not too late to create an obesity master plan which does engage us in new thinking. We are a unique culture with much that can lend itself to a model response to obesity. The work of creating a non-toxic environment is work that will benefit people in Hawaii for generations to come. It can synchronize with sustainability efforts, draw on the wisdom of ethnic groups, and on individuals who suffer from obesity and incorporate the values of the native host culture. We need to explore, at the deepest level, the message of obesity and use that exploration to guide us.

Throughout mining history, miners have taken a canary down the mine with them to signal when the environment has become too toxic for their safety. Ultimately, the canary dies if miners are inattentive. Perhaps obesity is the canary in the coal mine for us. Listening to its message will engage us in work that can promote the health of our citizens at the same time that it preserves the beauty and blessings of our state for many generations to come.

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