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ATTITUDES AND PREVENTATIVE HEALTH PRACTICES
IN RELATION TO OBESITY

by

Brieana L. Evans

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Nursing)

The Honors College

University of Maine

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Abstract

Over the past thirty years, obesity has become a health epidemic, affecting a large percentage of the United States population, leading to a decrease in quality of life related to comorbid illnesses, which are directly correlated to being overweight or obese. Due to these comorbid illnesses, obesity places a large fiscal burden on the healthcare system, directly associated with treating related diseases and indirectly through lost production due to “sick days”. In 2013, the American Medical Association ruled to classify obesity as a disease, which has brought about an increased need for preventative health measures. Steps toward obesity prevention are taking place on the community, state, and federal levels through research, education, wellness programs, and policy reform. This thesis examines the attitudes of UMaine faculty and staff towards obesity and the amount of control individuals feel they have over their own health. A survey was sent out to approximately 2,300 employees, to assess the preventative health practices they currently adhere to (i.e. diet, sleep, and exercise), and the participant’s BMI were calculated. Correlation studies were then run using SPSS version 21, to examine the relationship between preventative health practices and BMI. The study found that 54.4% of the employee population is considered either overweight or obese, with 86% of participants admitting that they have “a lot” or “complete” control over their own health, and 83% of people agreeing that obesity is preventable. These findings were then compared with the current preventative health services the University of Maine offers its employees. This thesis aims to highlight the importance of health and wellness at the local level to enact change in obesity rates on a national level.

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Introduction

Prevalence and Diagnosing

Over the past thirty years, obesity has become an increasing global health concern across the world, which affects all age and ethnic groups. In 2008, more than 10% of the world's population was classified as obese, having a body mass index (BMI) of 30% or higher, and subsequently, international obesity rates have doubled since 1980 (World Health Organization, 2013). This fact may come as no surprise to the majority of the population in the United States; however, the statistics are nothing short of alarming. According to the study done by Ogden, Carroll, Kit & Flegal (2012), published for the Center for Disease Control and Prevention, between 2009-2010, 35.7% of US adults were obese. Additionally, the American Heart Association estimated in 2013 that 33% of boys and 30.4% of girls ages 2-19 were overweight, having a body mass index (BMI) greater than or equal to 25, and of these children, nearly half were obese (Go et al., 2013). Because obesity is linked with many comorbidities, such as Congestive Heart Failure, Type 2 Diabetes, some cancers, and musculoskeletal issues, overweight and obesity is the fifth leading risk for deaths internationally (World Health Organization, 2013).

According to the World Health Organization (2013), 44% of the diabetes burden, 23% of ischemic heart disease and between 7-41% of certain cancers are attributed to overweight and obesity. Between 1986 and 2006, the adult deaths associated with overweight and obesity was 5.0% with 15.6% for Black and White men, and 26.8% and 21.7% for Black and White women, respectively (Masters et al., 2013). Due to the staggering prevalence of obesity in the United States, in 2013, American Medical Association (AMA) ruled for obesity to be labeled as a disease. This diagnosis is seen

controversial to many, but the AMA's decision to change obesity's labeling has forced insurance companies to change their coverage of wellness visits and annual exams, which the AMA is hoping may lead to better prevention practices in relation to obesity (Pollack, 2013). These practices may help to prevent the development of some of the comorbidities associated with obesity, and may help to reduce the economic burden obesity has placed on the United States Healthcare system.

Comorbidity and Mortality

There is substantial evidence that links obesity with a number of comorbid conditions including hypertension, hypercholesterolemia, type 2 diabetes, breast and pancreatic cancers and musculoskeletal conditions. These comorbidities associated with weight gain account for the majority of the health care costs surrounding obesity. Thus, managing "normal" BMI measurements and lowering the rates of people overweight and obese will help to reduce the economic burden. Throughout this thesis, "overweight" and "obesity" will be used interchangeably. Overweight is classified as having a BMI of over 25, and obesity is having a BMI of 30 or more. Those who are overweight are placed at a greater risk for developing obesity. Thus, those who are overweight are at greater risk for developing the comorbidities associated with obesity.

Many studies over the past twenty five years have linked obesity with hypertension. Although the specific causes of hypertension continue to be investigated, there is a strong correlation between those who are overweight and the prevalence of hypertension. Over time, chronic hypertension places an increased workload on the heart which is caused by the constriction of the arteries, thus causing an increase in pressure. Because the system has more pressure, the heart must pump harder to overcome the

resistance, leading to an increase in oxygen demand, and over time can cause ventricular hypertrophy. Hypertension affects nearly every body system but it most notably puts strain on the cardiovascular system. From 1988-1994, the National Health and Nutrition Examination Surveys (NHANES) collected data from over 30,000 people to provide estimates of the prevalence of comorbidities related to obesity. The survey found that the prevalence of hypertension is increased among both men and women. White men are 40% more likely to have hypertension if they are overweight than their non-overweight counterparts, and black men are 60% more likely to have hypertension. Similarly, both white and black women who are over-weight are at an increased risk for hypertension, with a 75% and 20% increased risk respectively (Ernst et al., 1997).

One of the ways hypertension is caused is by the thickening of the arterial walls, called atherosclerosis, due to the build up of cholesterol and other debris in the vessels. This collection of cellular debris, calcium, and cholesterol, called an atheroma, builds up in the walls of the arteries causing inflammation of the vessels, which leads to swelling of the arterial walls. The inflammation and swelling increases blood pressure because the walls of the arteries are thickened, causing a smaller diameter of the blood vessels.

Along with an increased prevalence of hypertension among overweight individuals, Ernst et al. (1997) study showed that serum cholesterol levels increase in men who are overweight by 8.8mg/dL, and by 19 mg/dL in women, which may account for some of the increased prevalence of hypertension in overweight individuals. In addition, leptin, a protein produced in adipose cells, levels are correlated with BMI (Maffei et al., 1995). Increased leptin levels are positively correlate to with muscle sympathetic nerve activity, which increases the body's sympathetic activity, reducing heart rate variability, and may

contribute to increased cardiac mortality and morbidity in those who are obese (Snitker et al., 1997).

Similar to the development of hypertension and hypercholesterolemia, hyperglycemia and the development of Type 2 diabetes have a strong correlation with obesity. Kahn & Porte (1996) showed that Type 2 diabetes is caused by insulin resistance and beta cell failure. Insulin is responsible for helping the body process and store glucose as glycogen, and to reduce the breakdown of triglycerides. Subsequently, serum glucose levels are reduced in the presence of insulin. Triglycerides, a type of fat, are made when glycogen, glucose in stored form, is combined with non-esterified fatty acids (NEFAs). In obese patients there is an elevated NEFA level, which suggests that the body's insulin is unable to convert the NEFA into triglycerides. This raises the blood glucose level because glucose and NEFAs are circulating unbound in the blood, which suggests an insulin resistance due to insulin's inability to convert glucose and NEFAs into a bound triglyceride (Bonadonna, Croop, & Zych, 1990). Insulin levels are increased in people who are obese (Peiris, Struve, & Mueller, 1988), which shows that the body is producing more insulin to attempt to compensate for its resistance. Another study found that leptin helps to regulate food intake and energy expenditure, and higher levels of leptin can impair the production of insulin and reduce insulin's effects on the liver, which may lead to the development of Type 2 diabetes (Flier, 1997).

Economic Burden and the Role of Preventative Health Care

Not only does obesity have a strong impact on individuals, but it has great financial ramifications on the healthcare system. Due to the number of disease processes associated with obesity, the U.S health care budget is directly impacted, and the cost of healthcare linked with obesity has increased over the past decade. In 1998, the cost of obesity on the health care expenditure was \$78.5 billion dollars which accounts for direct medical costs (i.e. treatment services, hospital and nursing home care, physician visits, and medications), and money lost due to cessation or reduction in productivity to the workforce due to work days lost, bed days, and restricted activity days. Nearly half of these costs were financed by Medicare and Medicaid (Finkelstein, Trogon, Cohen & Dietz, 2009). Currently, the American Heart and Lung association estimates \$254 billion dollars were spend on obesity costs with \$46 billion spent on direct medical costs, and \$208 billion lost in lost productivity. The direct medical costs are linked to the diagnosing, treatment, medications, and inpatient stays related to the conditions strongly linked with obesity: cardiovascular diseases, Type 2 Diabetes, musculoskeletal conditions and some cancers. In Maine, the CDC estimates that 20-30% of the population is obese. That means approximately 265,800- 398,700 people are at a risk for these obesity related conditions (Go et al., 2013). Implementing preventative health interventions and lifestyle changes related to obesity may help to curb the economic burden placed on the healthcare system.

Because of the AMA's ruling to label obesity a disease, insurance and healthcare facilities will need to promote measures for preventing, managing, and treating obesity, which will presumably affect the public's access to preventative healthcare and education

on promoting healthy lifestyles. By increasing and expanding these preventative health programs and advocacy efforts, local health departments could be an important resource in helping to curb the current obesity epidemic (Slater, Powell, Chaloupka, 2007).

Communities should be encouraged to work with local health departments to develop means of prevention that can be implemented in the school and work settings.

Due to the enormous cost of obesity on the healthcare system, preventative obesity measures may be the answer to reducing the health care cost. Though preventative measures may not always be efficient and cost effective, it is widely accepted that diet and exercise helps to reduce weight and to keep weight off. Many lifestyle changes and modifications can be incorporated into one's life with little to no extra cost, which makes obesity interventions economically significant when attempting to lower the cost of healthcare. These preventative health measures can be accomplished through educating children on cooking and healthy eating in schools, promoting healthy practices in the workplace, and creating new policies that effect the local communities and the national food industries. These interventions may have the chance to significantly impact the food culture of our country and the healthcare system.

Obesity Interventions

Obesity interventions are implemented on local, state, and federal levels through education, support groups, and policy reform, and focus on primary, secondary, and tertiary stages. Primary interventions place an emphasis on education that stresses the influence of diet and inactivity in the development of weight gain and obesity, and it aims to provide individuals with the knowledge base of lifestyle habits that improve wellness. Secondary prevention focuses on those who are overweight or obese, and aims to

pinpoint at least one way the individual can achieve a more healthy weight (i.e. reduce the consumption of sodas). Tertiary intervention is geared toward those who are obese and is more comprehensive than secondary intervention, focusing on several factors that lead to weight gain, and a more multidisciplinary approach.

It is widely accepted that diet and exercise have a direct impact on weight gain and weight loss. According to the United States Department of Agriculture, adults ages 18-64 need at least 2.5 hours of aerobic physical activity at a moderate level each week, which works out to 30 minutes, five days a week. A healthy diet for this same age group varies by activity level, age, and gender, but in general, adults needs between 1.5-2 cups of fruit, 2-3 cups of vegetables, 3-4 oz of grains –with at least half being whole grains, and 5-6.5 oz of lean meats per day. Processed foods and foods high in fats and sugar should be eaten in limited amounts, and should be avoided when possible.

In 2009, The Institute of Medicine produced a report that proposed recommendations for primary obesity prevention in children. These recommended interventions emphasize routine physical activity, healthy food and marketing environments that allow a child to appropriately recognize when they are full and when they are hungry, the incorporation of health care providers in the management of a child's weight, and the importance of the school systems in implementing these interventions to instill obesity prevention education in the students, starting from a young age (American Dietetic Association, 2010). Hoelscher, Kirk, Ritchie, and Cunningham-Sabo (2009) conducted a literary review for the interventions for prevention and treatment of overweight and obesity. The findings suggest and advocate that weight loss is best achieved through educating individuals about the importance of physical exercise and

proper nutrition when paired with an environment that fosters more time to be active and healthy food choices. Their literature was focused on pediatric prevention, with the majority of interventions taking place in the school setting, but their findings may show promise in the adult setting as well. More research should be conducted in the prevention of obesity in adults to support this claim. One of the studies included in the literature review was a study conducted in Australia with approximately 12,000 children, that assessed how education and environmental changes in the school system impact obesity rates. The interventions included, encouraging water consumption in lieu of sugar sweetened drinks, fewer high calorie snacks and foods, more fruits and vegetables, and promoting an increase in exercise and a decrease in television viewing and time on the computer. Over four years, these interventions were linked to a 2.5-3.4 % decrease in obesity in young children (de Silva-Sanigorski, Bell, & Kremer, 2010).

Unlike primary prevention, which is frequently conducted in the school setting, secondary prevention is often conducted in a primary care provider's office or in the medical setting. BMI, waist circumference, family history, and comorbidities are assessed, and a plan for weight loss is made. This frequently starts out with goal setting, weight monitoring, and logging of dietary intake and physical activity (Hoelscher et al., 2013). A dietary change may be implemented during this stage, which may be implemented by a registered dietitian. A low carbohydrate diet has been shown to be effective in weight loss (Siegel, Rich, & Joseph, 2009). This works by limiting the body's supply of glucose, which forces the body to begin breaking down fats, called ketosis, resulting in weight loss. A state of ketosis also decreases appetite, which leads to less calorie consumption. Other specific diet interventions focus on reducing foods that have a

high glycemic index, which also tend to be high in carbohydrates. Foods with a high glycemic index cause dramatic fluctuations in blood glucose levels, causing one to get hungry more quickly; therefore, more calories are consumed (Ebbeling & Ludwig, 2001). Eating foods low in fats, high in vitamins, minerals, phytochemicals, and omega-3s, with portion control can significantly lower BMI, and it considered a “behavioral” intervention (Steele et al., 2012).

Other secondary interventions focus on both dietary and physical activity modifications, and may contain behavioral modifications. DeBar, Stevens, & Perrin (2012) conducted a study to examine if adolescent girls would see significant weight loss if they were given more autonomy and less parental influence. The girls were randomly assigned to either a 5-month medium intensity behavioral intervention with separate teen and parent groups, or weight loss management consisting of internet resources on evidence-based weight loss strategies and a meeting with their primary care provider. At the 6 month and the 12 month follow up, the intervention group showed a sustained decrease in the mean BMI. These findings suggest that teens may find it more beneficial to have a sense of independence when trying to lose weight; however, it is still important to educate parents to increase adherence of wellness in the home setting.

With people who are considered morbidly obese, secondary interventions may be effective initially, but some may need more extreme interventions to help lose weight and reduce their risk for the development of chronic illness. Tertiary interventions that have been successful in reducing obesity in individuals include very-low calorie diets, pharmacotherapy, meal replacements, and bariatric surgery. When limiting foods high in fats, and eating more nutrient based foods is unsuccessful in treating obesity, a very low

calorie diet may be needed. This consists of an individual consuming less than 1000kcal/day, and it typically high in lean protein, fruits, and vegetables and low in carbohydrates, fats, and sugar. These diets have been shown to facilitate rapid weight loss during the first 10- 20 weeks of treatment (Figueroa-Colon, von Almen, Franklin, Schuftan, Suskind, 1993).

Community and Policy Reform

Local Health Departments (LHDs) are in a unique position to enact obesity prevention interventions in the local communities. Because LHDs work within individual communities, they are better able to assess the needs and gaps in education and local policies affecting local health and wellness. This may place LHDs as an important factor in implementing interventions in the future; however, very few LHDs across the country are taking advantage of their connections to the people within their community to influence and promote obesity education and wellness programs. Stamatakis et al. (2012) conducted a survey of 2,300 LHDs across the country to assess which LHDs offered obesity prevention programs. Of those departments that responded, only 2.7% offered obesity prevention activities. Additionally, only one LHD in the state of Maine, Penobscot's LHD, responded to the survey, and it currently does not implement an obesity prevention program. This study emphasizes a large gap in the local public health infrastructure where obesity prevention may be greatly effective, and these departments have the ability to form groups and committees to impact local policies. A study done through a phone interview in Germany, with over 3,000 participants, found that 98.2% of those surveyed believe that obesity is preventable. According to this survey, 59.6% of

people would be willing to take part in preventative health programs, with dietary changes receiving the highest support rates (Sikorski et al., 2012).

The purpose of this honors thesis is to examine the relationship between current attitudes towards preventative health measures among the University of Maine faculty and staff, and assess if these attitudes and health practices correlate with obesity. Similarly, our study assessed the faculty's and staff's beliefs about obesity prevention, and the health practices they currently engage in. We examined the participant's BMI to assess for obesity. Although BMI is not the only way to determine obesity, other measures include fat caliper and waist circumference measurements, calculating BMI was determined most appropriate for survey conducted research.

Method

Literature Review

A thorough literature review was conducted using Biomed Central, Medline, Pubmed, CINHALL, Cochrane Library, Foods Science and Technology Abstracts, and Nursing and Allied Health Collection via EBSCO. Search terms included written in English, peer-reviewed, "Obesity interventions", "Obesity and Local Health Departments" and "Obesity and Prevention." The literature was examined and was reviewed for sound research technique by factoring in qualitative vs. quantitative research, population size, randomization, bias, and validity. The literature that was determined "sound research" by the researcher, based on the previously mentioned factors, was included in the literature review.

Survey Development

A German study was conducted to investigate the German public's support for obesity prevention, preventative programs, and to assess the public's opinion about the causes of obesity. The researcher found via a telephone survey, that 98.2% of the public perceived obesity prevention to be possible. The survey also analyzed participants willingness to implement obesity interventions, such as educating parents on healthy eating, banning fast foods and soft drinks at school, and restricting advertisements for health foods. The majority of people supported many of the proposed interventions and agreed that they would be beneficial. This study acted as a springboard for the survey sent out to UMaine faculty and staff.

Like the German study, the UMaine study aimed to assess the public's belief about the causes of obesity, and the impact individuals have on their own health. Assessing the attitudes of obesity and preventative practices of the faculty and staff population helps to gain insight into what a sample population is doing to prevent obesity. Survey questions were generated by targeting preventative measures that are widely accepted to have an impact on weight (i.e. diet, exercise, and consumption of fast foods). Other questions, such as those focusing on sleep and visiting a primary care provider, may not directly correlate to weight gain, but they are important components of overall health. Before sending out the survey several other faculty members in the nursing department looked over the survey to assess the face validity.

The population for the UMaine faculty and staff survey was a sample of convenience. The faculty and staff on the University of Maine campus was chosen because the researcher had access to the email list of all faculty and staff, and because it

supplied the researcher with a large, possible sample population of 2,300. This sample consisted of 537 participants (n=537) with 42.9% male (n=225) and 57.1% female (n=299). The age of responders ranged from 23-73 with the mean age of 49.07 (SD 12.006). All participants were employed by University of Maine Systems and worked at the University of Maine, Orono campus at the time of the survey. 95% of responders were non-Hispanic (n=498). Approval for the study was granted from the University of Maine's Institutional Review Board. Qualtrics, a survey construction software used by the university, was then used to construct the survey, which was then sent via email to faculty and staff of UMaine. Of the 2,300 surveys sent out, 537 responses were gathered in the data set, which is a 23% response rate. In a discussion of evaluation in teaching, Nulty (2008) indentified that for an (n) of 2,000, a response rate if 25% would meet 'stringent conditions', that is 3% sampling error and a 95% confidence level. Thus a response rate of 23% for an (n) of 2,300 would meet these conditions. Some questions were unanswered by some of the participants. These omitted answers were accounted for when data analysis was run to preserve reliability. BMIs were calculated using Microsoft Excel by taking the weight of the participants in pounds, multiplied by 703, divided by the participants height in inches squared. Statistical data was entered into SPSS (version 21) and correlations and analysis were run.

Results

With 0.8% underweight, 43.3% within the normal BMI range, 33.4% overweight, 18.1% obese, and 2.9% morbidly obese, the data implies that more than half of the UMaine faculty and staff are over the acceptable BMI range. 54.4% of the population is thus considered overweight. BMI range was 17.54-50.63 with a mean of 26.64 with a SD

of 5.27. 67% of the participants feel they have “a lot of control” over their health, and 19% feel they have “complete control” over their health. A high percentage of responders, 86%, admit that their actions have a direct impact on their health. Similarly, 59% of people agree that obesity is preventable, and 24% strongly agree that obesity is preventable, which means 83% of people agree that obesity is preventable. Also, 45.8% of participants were sedentary “most of the day” and 33.2% were sedentary half of the day.

Table 1. Demographics (n=537)

Age	Range: 23-73 years Mean: 49.07
Gender	Male: 42.9% (n=225) Female: 57.1% (n=299)
Ethnicity	94.1% Caucasian (n=493) 95% Non-Hispanic (n=498)

#	Answer	Response	%
1	No control	0	0%
2	A little control	3	1%
3	Some control	72	14%
4	A lot of control	351	67%
5	Complete control	99	19%
6	No opinion	1	0%
	Total	526	100%

Figure 1. Participant’s feeling of control over their health

#	Answer	Response	%
1	Strongly Disagree	2	0%
2	Disagree	4	1%
3	Neither Agree nor Disagree	81	15%
4	Agree	314	59%
5	Strongly Agree	128	24%
	Total	529	100%

Figure 2. Participant’s feelings over obesity being preventable

Table 2. How often are you sedentary?

	Frequency	Percent	Valid Percent	Cumulative Percent
All day	7	1.3	1.3	1.3
Most of the day	240	45.8	45.8	47.1
1/2 of the day	174	33.2	33.2	80.3
1/4 of the day	94	17.9	17.9	98.3
I'm never sitting	9	1.7	1.7	100.0
Total	524	100.0	100.0	



Figure 3. Distribution of BMI among faculty and staff

Note. Underweight (1%), Normal (44%), Overweight (34%), Obese (18%), Morbid (3%)

Table 3. Correlations based on survey data

Lower BMI	Believe obesity is preventable* See their PCP less frequently** Exercise more frequently** Eat more fruits** Eat more vegetables* Eat more whole grains** Less sedentary** Eat less fast food**
Believe they have more control over their health	Believe obesity is preventable** Exercise more frequently** Eat more fruit* Less sedentary**
Exercise more frequently	Have lower BMI** Feel they have control over their health** Eat more fruits** Eat more vegetables** Eat more whole grains** Eat less fast food**

* significant at the 0.05 level

** significant at the 0.01 level

Discussion

Upon the initial assessment of the data, it appeared our population had a lower average BMI than the national average, but after running the numbers, the data, although the sample is small, appeared to mirror the national averages, and is thus a representative sample. By running correlation studies and linear regression, the data suggests that people with lower BMIs are more likely to believe obesity is preventable and partake in more “preventative practices.” They are more likely to exercise more frequently, eat more fruits, vegetables, and whole grains, and they are more likely to be less sedentary and eat less fast foods. People with BMIs in the normal range are more likely see their primary care provider (PCP) less frequently, which is opposite for people with higher BMIs, who are more likely to see their PCP more frequently. This may be due to those with higher

BMI's developing comorbidities which require more medical supervision and wellness checks.

People who believe they have more control over their own health are more likely to believe obesity is preventable, exercise more frequently, eat more fruit and are less sedentary. This may be related to self efficacy. Individuals who feel they are in control over their own health may take more preventative actions to keep themselves healthy. Similarly, those who exercise more frequently appear to understand the importance of their health. They are more likely to feel in control of their health, eat more fruits vegetables, whole grains, and eat less fast food.

Although those who have lower BMI's are more likely to believe that obesity is preventable, a good percentage of those who are overweight admit that obesity is preventable. A large percentage of the population admits that they have control over their health, and their weight, but still more than half of the people are overweight. This points to a gap and an inconsistency to the population's beliefs about their abilities to prevent obesity and their actions which do not always point towards health and wellness.

Limitations

Although the BMI distributions are similar to the national averages, the sample is one of convenience, and lacks geographic, racial, and occupational diversity. The survey was a self-reporting survey which may skew the data, based on the participant's responses. Similarly, the survey was labeled "Obesity Prevention", and it is possible that those who responded may have a special interest in the topic or cause an alteration in their responses. The possibility also lies in those, who may be obese, not responding because it is a survey related to their condition. Response rates may have been improved

by sending out a reminder email to encourage more people to participate. Only one email with a link to the survey was sent out, which may have limited the number of responders.

UMaine and Preventative Health

It is evident that the UMaine population has a significant need for obesity prevention by examining the BMI distribution. With 89% of individuals being sedentary at least half of the day, UMaine needs to find a way to better promote physical activity during the workday. Currently, the university has a weight loss, health promotion program, “Rise Up”, which provides incentives to employees who participate in preventative health measures. This program offers and encourages biometric screenings, health assessments, and wellness activities by which employees can earn points to work towards incentives. These incentives include a reduction in health insurance premiums: In 2012, premiums were 12% and were increased to 20%, but those who participated in the RiseUp program were spared the increase in premiums, and their rates were decreased to 10%. Another incentive for participating in the RiseUp program is a \$100 tax deductible bonus that is given after participating in various wellness activities. This is figured on a point system where each activity counts for a certain amount of points. Although these incentives are a great step in promoting health on the University of Maine campus, the percentage of overweight and obese faculty and staff suggests that this program is either not effective, is lacking in participants, or does not offer compelling enough incentives to meet the needs of the population. Future research may want to examine the BMI of those who do participate in the RiseUp program and how effective the participants perceive the program to be.

In addition to the RiseUp program, changes are being made to the accessibility of the UMaine Recreation Center to the faculty in order to promote wellness. Up until January, all faculty and staff had to pay for monthly memberships, costing \$32/mo; however, the University has implemented free membership to the fitness center for full time faculty. Although this is a step in the right direction, the majority of employees at the University are not considered “full-time faculty”, and this does not include full-time staff. Future research should be done to examine if the overweight and obesity rates decline over the next several years in relation to this change, which hopefully can be expanded to a larger percentage of employees.

Multifactorial Epidemic

As this study and survey has reflected, diet and exercise have a large effect on weight fluctuations, but it would be unwise to assume that the obesity epidemic could be reduced to these two modifications. This problem is a complex webbed system, with multiple factors stemming from agricultural, physiological, and genetic etiologies, and also incorporates influences from the media and how an individual is raised. For the majority of the time humans have been walking the Earth, humans have been hunter-gathers, using energy to obtain food sources, and frequently experienced droughts in food sources. In modern society, food is constantly around, with cues from the media triggering the body to believe it is time to eat. Likewise, the modern culture is one of convenience and stress, where grabbing food on-the-go is often the norm. This brings about two issues. The first one, stress, from busy, fast-paced modern society, releases cortisol into the bloodstream which causes our bodies to store foods more readily into fats

(Lottenberg et al., 1998). This is the body's primal response to stress. The culture of "go-go-go" is causing stress, which inadvertently the cause of fat storage.

Although there is more education on healthy eating than ever before, many people are still not getting the memo. One quick trip to the grocery store is all one needs to see that the general public is missing the mark on healthy eating. White breads, packaged meats, frozen dinners, sugary cereals and drinks, and processed foods are still finding their way into shopping carts, into homes, and into our bodies. This is largely due to a society that expects convenience. In a fast paced society, the majority of people would prefer to heat something up on-the-go than to take the time to chop, dice, stew, marinate and slow cook a meal with fresh vegetables, lean meats, and whole grains. Also, for many families, healthy eating is a financial burden. When families of four live paycheck to paycheck, eating a small box of fresh raspberries for \$4.00 is not as financially feasible as cooking a box of pasta for \$1.50. However, that being said, maybe the American public needs to have their perspectives readjusted. Instead of buying a bigger house, better car, or newer phone, individuals should strive to buy fresher fruits and vegetables and invest in their health with a gym membership which would directly impact their health, nutrition, and quality of life.

Sedentary lives are also to blame. The average American spends numerous hours in front of a screen. Thus, children spend less time outside playing and more time in front of their tablets, iPods, TVs, and computers. Yet, their calorie consumption does not match the sedentary lifestyle.

How one is raised has a large impact on their knowledge about healthy eating. The previous generation, "the meat and potato generation", due to the lack of nutritional

education at the time, did not have the current knowledge of healthy diets to pass on to future generations. Many Americans still feel the need to have a meat, starch, and a vegetable to be considered a “well balanced meal”. However, this does not always constitute as a healthy meal. A meal of cooked vegetables and a piece of fish is just as acceptable. Likewise, a salad with whole grains is equally as nutritious. Similarly, the “meat and potatoes” generation, having had financial burdens and food scarcities preached to their children “do not leave the table until you have finished your food.” This has brought about a society that feels guilty if food is left on a plate after a meal, which has led to overeating and inappropriate portions. With plate sizes increasing 36% since 1960, this notion of “finishing the plate” is detrimental (Klatell, 2012). People should be encouraged to eat until they are satisfied, not stuffed. A good way around this problem is to reduce the initial size of the portion, or when out to eat, people should share. This saves financially and calorically. Lifestyle changes and modifications of how food is perceived must be changed on a multifactorial level in order for systemic change to occur. Unfortunately large changes must be done with the system as a whole, and this change may take several generations before healthy lifestyles may be restored, but little changes have to start somewhere. Our eating practices must change, and habits need to be broken so that our future generations may find a way out of eating ourselves into bad health. It starts with changing the way this generation perceives food and nutrition, so that the subsequent generations will be raised accordingly.

In 2005, the mayor of Oklahoma City, Mick Cornett found his city on the “Most Obese Cities in the Country” list in Men’s Fitness Magazine. Appalled by the notion of running an unhealthy city, in 2007, he decided to put Oklahoma City on a “diet”, and he

was determined to make his city healthy (Cornett, 2013). Over the course of four years, changes were made throughout the city to enhance the quality of life of its population and to make changes that promoted a healthy lifestyle. After assessing the needs of the city, Cornett found that the infrastructure supported a quality lifestyle for that of a car, but not for people, and thus he stressed the importance of implementing changes to make the city more “walkable.” Hundreds of miles were added to city sidewalks and throughout developments in the suburbs, a 70 acre park was added to the center of the city, senior health and wellness centers were built, a downtown street car was added to promote walking, and a river sports facility was constructed to encourage recreational sports. After four years, Oklahoma City had collectively lost over one million pounds, and was placed on Men’s Fitness magazine’s “Most Fit Cities” list in 2012. This city’s example stresses that obesity needs to be looked at through the lens of education, policy development, cultural change, and through how cities are constructed to promote healthy lifestyle habits.

Interventions on a National Scale

Although the rates of obesity across the United States remains unchanged from 2003-2004 to 2011-2012 among older children, adolescents, and adults, the rates of obesity among 2-5 year olds dropped 43% from 2003-2004 to 2011-2012, from 14% to 8% (Ogden, Carroll, Kit & Flegal, 2014). These rates may pose an optimistic perspective on the obesity epidemic. Arguably, the obesity epidemic first became evident in the 1980s, meaning that over thirty years has passed since the realization that the American public was growing in physical size, which was directly effecting the health and longevity of the population. Since this time, researchers, educators, policy makers, and

health care professionals have begun to examine the gaps in obesity prevention and gain knowledge on factors that may be involved in the adaptation of unhealthy lifestyles. This drop in obesity from children ages 2-5 may be the results of the large scale changes that have been adopted over the past decade in particular.

In February, the New York Times published an article that highlights this decrease in young childhood obesity, and offers some possible causes that may be responsible for the positive trend (Tavernise, 2014). According to the article, there has been an overall drop in calories consumed by children, 7% drop for boys and 4% drop in girls, and children consume fewer sugary beverages when compared to 1999 data. Another source of this change may be related to the increase in the number of women who breast feed , which research has linked to more sustained weight control throughout childhood. Barry M. Popkin, a researcher at the University of North Carolina at Chapel Hill links this decline in young childhood obesity to the data that suggests families with young children have been buying lower-calorie foods. He associated this trend with the federal funded Special Supplemental Nutrition Program for Women, Infants, and Children which recently reduced its funding for fruit juices, cheese, and eggs and increased the funding for fruits and vegetables. Other possibilities for the decrease in obesity could point to the policies aimed at reducing obesity on the local, state, and federal levels. For example, Michelle Obama’s “5-2-1-0” campaign encourages 5 or more fruits and vegetables, 2 hours or less of recreational screen time, 1 hour or more of physical activity, and 0 sugary drinks a day. Across the United States 10,000 child care centers have committed to implementing these guidelines in their facilities.

Because there are many factors that influence the development of obesity, it is critical to have a diverse range of interventions to enforce a magnitude of change systemically. This decline in young childhood obesity may be a direct consequence of the current changes in place which has led to a new generation of parents who are more educated on the causes, preventions, and consequences of obesity so that they are passing on healthy habits to a new generation of young children. Although the population has a long way to go to see a decline in obesity rates across all age groups, hopefully this data of decline in young children will ignite an optimistic trend for the whole and is, perhaps, a sign of a new generation being raised with better, more healthful habits.

The Department of Health and Human Services has developed “Healthy People 2020,” which focuses on various areas of health to improve before the year 2020, and nutrition and weight management is included among them. Healthy People 2020 emphasizes the importance of healthy diets and weight management to achieve health and reduce chronic illness. The objectives focus on interventions that address individual behaviors, and policies and environments that encourage these behaviors in schools, healthcare facilities, workplaces and within communities. The program also stresses that future research will need to be directed towards assessing which interventions are most effective to help direct innovative policies. Evidence based practice will be beneficial in understanding how to prevent unhealthy weight gain (United States Department of Health and Human Services, 2013).

Conclusion

By examining the percentage of the UMaine faculty and staff that are classified as overweight and/or obese and the current wellness interventions the University offers to its

employees, it is evident that there is a gap in intervention efficacy. A large majority of the population feels they are responsible for their health and have power over their weight, but they struggle to gain control, which places them at significant risk for heart disease, Type 2 diabetes, musculoskeletal ailments, and some cancers. Because of the substantial amount of research that has been done on obesity preventions, it is essential for local communities, and state and federal agencies to begin to adapt these changes to improve the quality of life to its people. Businesses, corporations, schools, and local communities hold responsibility in offering services that help to encourage this change, which may also prove to be beneficial, not only in the health and happiness to individuals, but also in the fiscal weight that physical wellness may bring to a corporation. Promoting wellness among employees may help to improve job satisfaction and reduce the sick days one takes which directly impact revenue in businesses, or on college campuses, and reduce the continuity in teaching which may hinder learning. Small interventions that are implemented on the local level may help to push the decline in obesity seen in young children to adolescents and older adults that will improve health and quality of life over the next decade.

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Appendix A: IRB Informed Consent

You are invited to participate in a research project for an Honors Thesis being conducted by Briana Evans, an undergraduate student in the School of Nursing at the University of Maine, with Dr. Patricia Poirier, School of Nursing, as the faculty sponsor. The purpose of the research is to examining the attitudes and health practices of the faculty and staff here at UMaine, and how they relate to obesity .

What Will You Be Asked to Do?

If you decide to participate, you will be asked to complete a short survey that will take about five minutes of your time. This survey will ask questions on diet, exercise, and sleep habits.

Risks

-There is the possibility that you may become uncomfortable answering the questions. In the event you feel uncomfortable answering a question, you may skip that question, or stop taking the survey at any point.

Benefits

- While this study will have no direct benefit to you, this research may help us learn more about health habits of the faculty and staff at UMaine.

Confidentiality

This study is anonymous. Please do not write your name on the questionnaire. There will be no records linking you to the data. The data will be kept on a USB of the principal investigator and then destroyed after one year.

Voluntary

Participation is voluntary. If you choose to take part in this study, you may stop at any time. You may skip any questions you do not wish to answer. The submission of the survey implies consent to participate.

Contact Information

If you have any questions about this study, please contact me at briana.evans@umit.maine.edu. You may also reach the faculty advisor on this study at patricia.poirier@umit.maine.edu. If you have any questions about your rights as a research participant, please contact Gayle Jones, Assistant to the University of Maine's Protection of Human Subjects Review Board, at 581-1498 (or e-mail gayle.jones@umit.maine.edu).

Author's Bio

Brieana Evans grew up in Hermon, Maine, and moved to St. Louis, Missouri for Jr. High and High School. After graduation, she and her family moved back to Hermon where she began her undergraduate career at the University of Maine with a major in Biology. After studying abroad in Barcelona, Spain during her third year at the university she switched her major to nursing. Throughout her time in the college of nursing, she has completed hundreds of clinical hours at St. Joseph's Hospital and Eastern Maine Medical Center, where she attended her Senior Partnership on Pediatrics. Passionate about international nursing, she joined University of Maine Nursing International and traveled to Belize to provide community nursing care in the native villages. She is passionate about preventative health care and hopes to obtain her Doctor of Nursing Practice (DNP) and start her own business as a preventative health and wellness consultant, where she will be a resource to towns and cities to assist in implementing wellness programs and policies.