FAD DIET OR EXERCISE? MAINTAINING WEIGHT AMONG MILLENNIALS

by

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FAD DIETS OR EXERCISE? MAINTAINING WEIGHT AMONG MILLENNIALS

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ABSTRACT

Background: Research indicates millennials are more concerned about having healthy eating habits than following fad diets, and they exercise more than their baby boomer counterparts. The purposes of this study were 1) to determine reasons university students follow fad diets, and 2) to determine other methods students utilize for weight management.

Methods: In this un-blinded, randomized trial approved by TCU IRB, participants completed an online research questionnaire after providing informed consent. Population included 236 TCU male and female students, 18-22 years old. Analyses assessed students’ history of fad dieting and outcomes, perceived health status based on body weight and image, eating and exercise habits, and incidence of lifestyle practices such as smoking and alcohol use. Data was analyzed using SPSS (p<0.05). Frequency distributions and correlations were analyzed for trends in health maintenance behaviors.

Results: Participants self-identified as 76% females, 85% white, 6% Hispanic, and 4% other ethnicity. Only 32% of participants had followed a fad diet (p=0.01). Participants who followed fad diets included 30% Paleolithic®, 23% Gluten-Free®, 20% Weight Watchers®, and 14% Atkins®. Of those who followed the respective diets, 58% did not achieve desired results and reported feeling tired, had no change in health status, experienced temporary weight loss, and always felt hungry, and 56% of participants answered “no” when asked if fad diets work. Of those who followed a fad diet, 40% would not follow one again. Results also show a strong relationship between females and healthy eating habits, weight pressures, and normal weight perceptions (p=0.01). Finally, weight loss behavior results show that 97% of participants exercise, while only 57% consciously eat less, and 55% count calories (p=0.01).

Conclusions: University students who followed fad diets experienced temporary or adverse results. Exercise was preferred rather than dieting to maintain weight.
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CHAPTER 1

INTRODUCTION

Over one third of American adults are overweight (BMI 25-29.9), and another one-third are obese (BMI ≥30 or greater). These numbers will only increase until the population learns how to healthily lose weight and maintain weight loss. With this increasing percentage of Americans who are becoming overweight and obese, the need for nutrition education has increased as well. As a result, fad diets have grown in popularity. The University of Pittsburgh Medical Center defines a fad diet as one that “promises quick weight loss through what is usually an unhealthy and unbalanced diet” and is “targeted at people who want to lose weight quickly without exercise”. There are a multitude of different diets that have become popular but have also died away in recent years. Many individuals look to dieting or a regulated selection of food intake for a quick and dramatic fix to lose weight.

Approximately 45 million Americans follow a diet every year. Although these diets may provide quick results, the likelihood of keeping the weight off is low, and approximately half of the individuals who follow fad diets gain the weight back within a year. Fad diets may allow individuals to lose weight initially, but they can be ineffective in helping individuals maintain the weight loss because in reality, some people who follow these diets do not follow them correctly or do not follow them for a long enough time. Individuals who are looking to lose weight should instead adopt an eating habit or lifestyle that is more sustainable long-term.

This study focused on millennials, specifically college students, because that is the population of the researchers. The purpose of this study was threefold: 1) to determine why millennials follow fad diets, 2) to determine millennials’ perceptions of fad diets, and 3) to determine which, if any, of these fad diets are perceived as effective. A research questionnaire
was utilized to ascertain if four popular fad diets followed by millennials were effective in helping that population lose and maintain weight. Study participants were asked if they perceived the fad diets to offer any benefits such as gaining a more positive self-image, having more alertness, or being in a better mood. The null hypothesis of this project was that fad diets such as Weight Watchers®, Gluten-Free, Atkins®, and Paleolithic Diet® will not show to be effective in improving health or weight loss due to the short length of time the diets are followed and the lack of a total lifestyle change to improve health long-term.
CHAPTER II

LITERATURE REVIEW

The research studies discussed in the following literature review include the previously mentioned fad diets and the results from following them. The findings from the studies mentioned below were based off the general population and not solely millennials.

The Gluten-free Diet

The gluten-free diet has grown in popularity in recent years. This diet eliminates gluten, a protein found in wheat, barley, and rye and is most commonly utilized as a treatment for individuals with celiac disease. Recently more books and articles have been published about this diet, as well as the number of celebrities endorsing it, which may attribute to its increase in popularity and use. Consequently, the market for gluten-free products has increased significantly in the past few years, as people tend to think these products are healthier based on what they have seen and heard. Although this diet has gained recognition and attention, there is minimal data to support the supposed advantages of a gluten-free diet for those who do not have celiac disease. Gluten-free food alternatives often have an increased amount of fat and sugar. For example, a Walmart blueberry muffin contains 340 calories and 24 grams of sugar, while a Whole Foods gluten-free blueberry muffin of comparable size contains 370 calories and 31 grams of sugar. Therefore, it is highly likely that those who substitute foods with gluten-free substitutes consume more fat and calories. A gluten-free diet has also been reported to be low in B-vitamins, folate, and iron, because these nutrients are often missing in the gluten-free counterparts. In addition, those who follow a gluten-free diet without consuming a wide variety of foods may more likely be exposed to certain toxins. For example, rice is commonly used in gluten-free products, and inorganic rice has been known to contain arsenic. It is advised that an
individual following a gluten-free diet consult closely with a registered dietitian to ensure that his or her diet includes a wide variety of foods so not to become deficient in B-vitamins, folate, and iron that may be lacking in the gluten-free products.

With increased popularity of the gluten-free diet, advances in food technology have resulted in an availability of more gluten-free products on the market that actually taste good. As stated before, these counterparts often lack essential nutrients that are in foods containing gluten. Therefore, if one is to follow the gluten-free diet, it is best to do so by replacing gluten-containing foods with whole foods such as fruits, vegetables, or gluten-free whole grains such as oats and quinoa. These foods can provide a wide array of vitamins and minerals that are not often found in processed gluten-free products.

In a study comparing the diets of children before and after the diagnosis of celiac disease, the percentage of macronutrients consumed remained the same, as did the intake of vitamins and minerals. Children following the gluten-free diet consumed increased monounsaturated fatty acids and decreased saturated fatty acids. There was an increase in the weight of the children, but their body mass indices remained the same. Since the study was conducted with children who actually had celiac disease, it was believed that the parents were committed to following the diet by including foods with a variety of vitamins and minerals instead of just replacing gluten-containing foods with gluten-free counterparts. As a result, it is believed that the gluten-free diet can have potential health benefits, or at least not alter nutrition status significantly, if a variety of whole foods are included in the eating plan.

**Weight Watchers®**

Weight Watchers® has been a popular diet plan for many Americans since it was created in the 1960s. This popular fad diet incorporates individual counseling and support groups with
diet alterations. In one study, researchers compared the effectiveness of a behavioral weight loss treatment program combined with Weight Watchers® to the Weight Watchers® program alone. After 48 weeks, 37% of the participants in the Weight Watchers® alone program lost 10% of their body weight, and only 15% of the participants in the Weight Watchers® plus the behavioral weight loss program lost 10% of their body weight. The participants from the Weight Watchers® alone program had better attendance at the support group meetings because they only had to attend meetings for one program, so they did not receive inconsistent information from going to sessions from other programs as well. This study suggests that those who follow the Weight Watchers® program for an extended period of time and consistently attend the meetings can achieve significant weight loss.\(^8\)

Another study followed individuals as they participated in the Weight Watchers® program for 12 weeks. Participants followed the diet recommendations and attended support meetings once a week. For those who completed the 12-week study, an average of 2.8 kg (3.1% of the baseline body weight) were lost. Participants lost more weight the more meetings they attended, with a maximum attendance of twelve meetings, and about one third of the participants lost 5% of their body weight. Although this study did show positive results, the 12-week study was short, and more research is warranted to ascertain if the weight can be kept off or not.\(^9\)

Another interesting study compared the average weight loss among Weight Watchers® participants to those who followed a Rosemary Conley®, an Atkins®, or a Slim-Fast® diet for six months. Those who participated in Weight Watchers®, lost 6.6% of their body weight compared to a 6.3% weight loss for those who followed the Rosemary Conley Diet, a 6.0% weight loss for those who followed the Atkins® Diet, and a 4.8% weight loss for those who followed the Slim-Fast® Diet. Participants in the Weight Watchers® group had a 0.5 mmol/l
fall in serum cholesterol levels, which was highest among the groups. Participants who continued to follow their diet, regardless of the diet, beyond the six months and came back for a follow-up at 12 months, lost approximately 10% of their weight. The results from this study show that those who are highly motivated can achieve weight loss through the Weight Watchers® program.³

**The Atkins® Diet**

The low-carbohydrate Atkins® diet has been growing in popularity as another fad diet. The previous study discussed the effects of an Atkins® diet in comparison to the Weight Watchers® program, a Rosemary Conley® diet, and a Slim-Fast® diet. Those following the Atkins® diet lost about 6% of their weight. Weight loss in the first four weeks was highest among participants in the Atkins® group (4.4 kg), but as time progressed those following the other diets lost as much weight as those following the Atkins® diet. In the first two months, body fat loss was highest among the Atkins® group participants but again leveled out after six months. Essentially, the Atkins® diet provided a quick means for weight loss. In order to maintain that weight loss over time, one has to have strict adherence to the diet. Realistically, this diet is not sustainable long-term, because the body needs energy from carbohydrate sources for fuel, and this diet allows little carbohydrate intake.³

In another study, researchers compared the effectiveness of a low-fat diet, a low carbohydrate diet (Atkins® diet), and a Mediterranean diet on losing and maintaining weight loss over a two-year period. The first six months focused on weight loss, and the last 18 months focused on maintaining that weight loss. Participants consuming the low carbohydrate Atkins® diet consumed 20 g carbohydrates for one day and gradually increased daily to a maximum of 120 g a day to maintain the weight loss. Participants consuming the low-fat diet consumed 30%
of their dietary calories from fat, 10% of the calories from saturated fat, and less than 300 mg of cholesterol. Participants were also encouraged to consume plant-based protein and fat sources, because the diet was supposed to resemble the typical Atkins® Diet. The total average weight loss among participants who followed the low-carbohydrate Atkins® diet for two years was approximately 5 kg, which was comparable to weight loss among participants in the Mediterranean group (4.6 kg) but more than the weight loss among participants in the low-fat group (3.3 kg), all of which followed the diet for two years. The low-carbohydrate and Mediterranean diets also increased metabolic effects. Those following the low-carbohydrate diet had more urinary ketones than those in the other groups. This diet should be tailored to individual needs.\textsuperscript{10}

A final study involved 50 obese participants who were randomly assigned to either a low- or high-carbohydrate (26% or 58% of calories from carbohydrates respectively), energy-restricted diet for four weeks. After four weeks, the mean weight loss in both groups was approximately 5%. Participants following the low-carbohydrate diet saw a greater decrease in blood pressure and LDL cholesterol levels, but individuals in both groups had comparable reductions in fasting blood glucose levels. The low carbohydrate diet was supplemented with plant proteins and oils instead of meats.\textsuperscript{11} Although more research is warranted, a low-carbohydrate diet that includes plant protein and fat sources may be an effective diet for losing weight and improving serum lipid levels.

The Paleo® Diet

The Paleo® Diet, a diet reportedly based on eating like those who lived during the Paleolithic time period, has been gaining popularity for its emphasis on foods from the earth. This eating plan is based on the idea that the genetic composition of humans cannot handle the
processed foods eaten today, so the human body develops diseases that the body is not equipped to fight. In a weight loss intervention study, participants with metabolic syndrome characteristics were divided into two groups: those who followed the Paleo® Diet and those who followed a general healthy diet, a diet based on the Dutch Health Council Guidelines. After two weeks, those on the Paleo® diet had lower blood pressures, lower serum cholesterol and triglyceride levels, a higher mean HDL cholesterol level, and more weight loss. Individuals in both groups exhibited decreased waist circumference and fasting serum glucose levels, but the change was not significantly different between the groups. It was concluded that the Paleo® diet has shown to be effective in improving symptoms associated with metabolic syndrome. As the study showed, eating foods such as lean meats, fruits, vegetables, nuts, eggs, and fish and supplementing with vitamins and minerals that might be lacking, such as calcium, positively altered symptoms associated with metabolic syndrome.

In another randomized study, participants with diabetes followed either a Paleo® or a “diabetes diet” that included consumption of fruits, vegetables, fiber, whole-grain bread, and most of the energy from naturally rich carbohydrate and fiber foods for three months and then switched diets and followed the other diet for another three months. After the three months, participants were asked to answer questions such as whether or not their serum blood glucose levels improved, how hungry they were after each meal, and whether or not they thought the diet was positive or negative. From their responses, it was concluded that the Paleo® Diet was more satiating in regard to the energy per meal, but this is just perceived improvement. After following the Paleo® diet, more participants commented that they were able to lose more weight compared to following the “diabetes diet”, but adherence to the Paleo® diet was also more
difficult. Therefore, the Paleo® diet has shown to have positive effects for those with diabetes even though it is hard to follow for a long period of time.\textsuperscript{14}
CHAPTER III

METHODS

Study Design

This was an un-blinded, randomized trial. Participants were asked to complete a three-part, 33 question online research questionnaire that took about ten minutes. The research questionnaire was generated via Survey Monkey®. Participants could complete this questionnaire anywhere they had access to a computer or mobile device and Internet. Before completing the survey, participants were required to indicate that they had read the consent and HIPPA forms informing them of the study, understood that it was voluntary, and understood how their information would be stored and kept confidential. The research questionnaire assessed the perceived effectiveness of the fad diets followed by millennials in helping those students lose weight or attain a positive health image. Demographic information collected included ethnicity, family income, age, and gender. Questions involving health status, including level of exercise, disease/disorder status, how weight is perceived, and how participants have previously controlled their weight were collected. Questions about fad diets, including which ones the participants followed, why, for how long, and the physical, mental, and emotional results of following the fad diets were collected as well. The study was approved by the TCU Institutional Review Board (IRB) and the Department of Nutritional Sciences Research Review Board.

Participants

Participants were recruited in multiple ways. Faculty in the TCU Department of Nutritional Sciences (NTDT) were solicited to send the questionnaire to all students in their classes during Spring 2017. The survey link was also sent via Facebook to members of various TCU student organizations. Students received an email containing a link to the Survey Monkey®
questionnaire. College students, ages 18-22, male and female, were recruited for this study. Exclusion criteria included anyone under 18 years old and those who selected that they had never followed a fad diet. The survey was sent primarily to students in NTDT classes and to students who were members of organizations to which the researchers belong.

Protocol

The survey was administered to students who chose to take part in the research and completed the consent form. Participants were asked to complete the online survey following consent. Participants could withdraw at any time without penalty. Survey data was collected, de-identified, stored, used, and disposed to protect confidentiality. All completed consent forms will be stored in an online storage folder in Survey Monkey® for at least three years.

Statistical Analyses

Data was analyzed to meet study objectives. Analyses assessed students’ history of fad dieting and outcomes, plus perceived health status based on body weight and image, eating and exercise habits, and incidence of lifestyle practices such as smoking and alcohol use. Data was organized to determine response frequencies, descriptive statistics, and correlation between selected variables (p≤0.05).
CHAPTER IV

RESULTS

The population studied was a representative portion of the TCU population. It included 251 participants, but only 236 participants completed the entire survey. The demographic profile of the 236 participants included 76% females, 57% ages 18-20, 61% sophomores or juniors, 85% White/Caucasian, 93% English speakers, 50% lived in a University residence hall, and 65% whose family annual income was over $100,000. The participants cited their academic major as either communications or business (67%). Of the population, 92% did not have diabetes; 93% did not have celiac disease; 86% did not smoke, but 89% did identify that they consume alcohol. Seventy-three percent of the participants reported their current weight to be normal. Thirty-nine percent indicated that they pressured themselves to be a certain weight, and 26% said the media pressured them.

A large portion (41%) of this population rated their eating habits as healthy or very healthy; 36% rated them as normal, and 23% rated them as unhealthy or very unhealthy. The majority of this population determined their activity level to be either moderate (40%) or vigorous (37%). Approximately 89% did not participate in college athletics, and approximately 70% also did not participate in intramural sports, but 83% did indicate that they played a high school sport. Differences between males and females were also noted in eating practices and weight loss behaviors. Compared to females, males were shown to exhibit more sedentary physical activity behaviors and consume more alcohol per week (p≤0.01). Whereas, females reported healthier eating habits, felt pressured by themselves to be a certain weight, and perceived themselves to be a normal weight (p≤0.01).
Graph 1: Weight Loss Behaviors Followed by Study Participants (Millennials)

Graph 1 indicates which behaviors students followed to maintain or achieve a certain weight. As shown, exercise was the overwhelmingly popular answer, as 97% of students selected it. Following exercise, 57% of students consciously eat less than they want, 55% count calories, 47% consume low-fat or fat-free products, 42% consume sugar-free products, 31% measure or weigh portions, 15% count net carbs, and 10% count grams of fat. As shown in the graph, exercise was selected more frequently as the main weight loss behavior. Those participants who reported they were a normal weight noted they exercised a moderate amount weekly as a means to lose or maintain weight, maintained healthy eating habits, and also played high school athletics (p≤0.01). There was also a significant relationship between those who lived in a university residence hall and exercised moderately weekly (p≤0.01).
Students who selected they had healthy eating habits said they would not follow a fad diet because “they do not work” (p≤0.01). Only 33% of the population had followed a fad diet before. The majority of the participants only followed the diet for 0-4 weeks (47%) and only one time (56%). Two-thirds of the population reported that they did lose weight, but 72% said their results were short term (1-4 months), and 37% said they did feel better or lost weight. Forty percent of this population said they would not go on the specified fad diet again, and of the population that had never followed a fad diet approximately 50% said they would not consider going on a fad diet. Finally, 56% said they would not follow a fad diet at all because “they do not work”.

Shown below in Graph 2 is the breakdown of fad diets students indicated they had followed before. More students followed a Paleo® diet (41%) than the gluten-free diet (31%), Weight Watchers® (27%), or the Atkins® diet (19%). Roughly 62% percent followed the fad diet to lose weight, but 58% of these participants said they did not achieve their desired results. Participants who did lose weight while on the fad diet reported being hungry all the time and being more tired (p≤0.01). Those who followed the Atkins® diet had temporary weight loss (p≤0.01), and students who followed a gluten-free diet did have temporary weight loss but felt tired (p≤0.01). Additionally, those students who followed the Paleo® diet had temporary weight loss with short-term results but would also not follow the diet again (p≤0.01).
Graph 2: Diets Followed by Study Participants (Millennials)

Diets Followed
CHAPTER V

DISCUSSION & CONCLUSIONS

One large takeaway from this study is that college students, and more broadly millennials, use exercise rather than strict dieting to maintain a healthy lifestyle. Another study conducted with millennials examined how they value health fitness compared to Generation X and Baby Boomers. The study showed that “healthy” meant exercising to 22% of millennials but only 14% to Generation X and 12% to the Baby Boomers. To 43% and 46% (Generation X and Baby Boomers, respectively, “healthy” meant not falling sick, while that definition for healthy only applied to 29% of millennials.\(^{15}\) This study shows that being “healthy” to the younger population is more than just not being sick or staying out of the hospital. It means actively pursuing a healthy lifestyle through at least one means of exercising. Another study showed that four out of five millennials workout at least once a week. That statistic is 15% higher than for Baby Boomers.\(^{16}\) In the current study when asked why students would not follow a fad diet, popular answers included that they do not work or they do not know what a fad diet is. For students, it could be easier to just go to the gym and get in a quick workout rather than take the time and money to eat healthy, nutritious food to maintain a “healthy” lifestyle.

Additionally, according to the International Food Information Council’s 2015 Food and Health Survey, millennials concern themselves to a less degree about calories and fat than do the American population.\(^{17}\) About 25% of millennials would agree that higher-protein foods may not be as healthy as they are portrayed to be in some high-protein diets, such as the Atkins® diet, while only 14% of the general population have the same mindset. Not as many millennials count or limit calories as do those in the general population, and 20% of millennials, compared to 27% of the American population, claim that calories from any type of food affect weight gain equally, a claim
that goes against what many fad diets are all about.\textsuperscript{17} This information shows that millennials are not as obsessed as other generations are with counting calories to maintain weight, and they do not believe the fad diet mentality that eating higher percentages of certain macronutrients will result in weight loss. Millennials realize that an overconsumption in any macronutrient may result in weight gain, and that moderation in all categories yields the best results.

In a similar study looking at dieting among college females and its relationship with eating behaviors, the results also showed that women were using exercise more than eating practices to lose weight. This study indicated that women are under constant pressure to be a certain weight.\textsuperscript{18} With social media becoming more and more popular with people this age, college students, especially women, have pressure coming from many sources to be a certain weight or at least to be healthy overall. The important part is to not let eating habits become dangerous.

If this sample of students is representative of the TCU population, then for the most part TCU students are physically active, have healthy eating habits, and perceive themselves to be a normal weight. Upon further literature review, these characteristics are shown to run true throughout the nation. According to the 2016 American College Health Association’s National Health Assessment, 58\% of college students participated in moderate-intensity exercise 1-4 days out of the week, and 59\% of them were a healthy weight (BMI 18.5-24.9).\textsuperscript{19}

One limitation of this study is that it only included TCU students. TCU has a very non-diverse population that includes many students coming from similar backgrounds. Additionally, TCU is comprised with overall healthy people. If one were to walk around campus, he or she would see mostly outwardly-looking healthy students and rarely observe an overweight or obese student. Although scientific literature regarding the assessment listed above showed that for the most part college students nationwide are overall healthy too, it would be advised to reproduce this study
using students from different universities in different parts of the country to achieve the most representative sample of students in the United States.

This study relates to registered dietitian nutritionists (RDN) in many ways. It is important for RDNs to know their target audience before educating those people about nutrition. For instance, when giving nutrition advice to a college student, it would be helpful to know that they are not interested in diets and might exercise more frequently to maintain a healthy weight and lifestyle. Along the same lines, RDNs must tailor their nutrition education and messages to the audience they are teaching. Therefore, the RDN needs to research the target audience regarding how they perceive health, nutrition, food, and exercise and strategies they use to maintain or achieve a healthy weight and lifestyle.
References


5. Marcason, W. Is there evidence to support the claim that a gluten-free diet should be used for weight loss?. Journal of the American Dietetic Association, 2011;111, 1786.


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APPENDIX A: PROTOCOL

INSTITUTIONAL REVIEW BOARD
STUDENT PROTOCOL REVIEW REQUEST

The TCU Institutional Review Board (IRB) is responsible for protecting the welfare and rights of the individuals who are participants of any research conducted by faculty, staff, or students at TCU. Approval by the IRB must be obtained prior to initiation of a project, whether conducted on-campus or off-campus. While student research is encouraged at both the undergraduate and graduate level, only TCU faculty or staff may serve as Principal Investigator and submit a protocol for review.

Please submit this protocol to the appropriate Departmental Review Board for recommendation and submission to the IRB. DRBs will submit to the IRB electronically at IRB.StudentSubmit (pdf preferred). Include the Protocol Approval Form as a word document with highlighted sections filled in. Also submit a consent document, HIPAA form if applicable, Protecting Human Research Participants Training certificates, recruitment materials, and any questionnaires or other documents to be utilized in data collection. A template for the consent document and HIPAA form, instructions on how to complete the consent, and a web link for the Protecting Human Research Participants Training are available on the TCU IRB webpage at www.research.tcu.edu. Submission deadline for protocols is the 15th of the month prior to the IRB Committee meeting.

1. Date: 2/16/17
2. Study Title: Determining Why College Students Go On Fad Diets
3. Principal Investigator (must be a TCU faculty or staff): Dr. Anne VanBeber (PhD, RD, LD)
4. Department: Texas Christian University, Department of Nutritional Sciences
5. Other Investigators: List all faculty, staff, and students conducting the study including those not affiliated with TCU. Leigh Mattson and Katherine Shamoon (Seniors, Coordinated Program in Dietetics)
6. Project Period: August 2016 – May 2018
7. If you have external funding for this project – N/A
   Funding Agency: N/A
   Project #: N/A
   Date for Funding: N/A
8. If you intend to seek/are seeking external funding for this project – N/A
   Funding Agency: N/A
9. **Purpose:** Describe the objectives and hypotheses of the study and what you expect to learn or demonstrate:
The purpose of this study is to determine reasons college students follow fad diets and which if any of those diets are perceived effective.

10. **Background:** Describe the theory or data supporting the objectives of the study and include a bibliography of key references as applicable.

Over one-third of adults in America are obese, and the number continues to grow (1). As a result, people turn to fad diets to lose weight. However, fad diets tend to only provide quick fixes because most people gain 50% of the weight back by one year (2). Thus, a review of four of the most popular fad diets may assess which ones are perceived to be effective.

The well known gluten-free diet is often misinterpreted which may cause adverse effects in those who do not know how to follow it properly. This diet is commonly prescribed as a critical medical treatment for individuals with celiac disease (CD), an autoimmune condition for which no other therapy is currently available (3). However, it has become a diet that many without celiac disease have tried due to the societal norm that gluten is harmful. Research has shown that when exchanging gluten-containing foods for gluten-free packaged foods, one can potentially develop nutrient deficiencies, become endangered by specific toxins, and end spend significantly more money on higher priced gluten-free items (4). Because most people do not follow this diet the way it is intended, there is no evidence-based research supporting a gluten-free diet for those who do not have celiac disease (5).

Weight Watchers® is a program that provides participants with weekly meetings, a healthy meal plan, and guidance with physical activity. Research has shown that participants who followed this diet plan lost at least 5% of their body weight in 12 weeks (6). However, research has also shown that more often than not, participants regain this weight (7). In another study done over six months, Weight Watchers® participants lost 5.6% of their total body weight, but only half of the participants stayed with the diet after the study duration (2). Although this diet seems to be effective, research shows that more participants are unable to keep the weight off when compared to those who are successful with the Weight Watchers® diet.

The Atkins diet is another popular fad diet. It involves eating a very low amount of carbohydrates and a high amount of fat. In one study participants lost 2.1-4.7 kg and developed lower blood pressure after 12 months (8). After 24 months, participants gained the weight (9). In another study using a low-carbohydrate, “Eco-Atkins” diet, the participants had better heart disease risk, decreased blood pressure but did have increased serum lipid levels (10). Although this diet has potential positive effects, it proves ineffective unless the weight can be kept off.
Lastly, the Paleolithic diet has been increasing in popularity the past few years. It stems from the stone age era where individuals consumed meat, various roots, vegetables, seasonal fruit, and nuts (11). In one study comparing Paleolithic to Mediterranean diets, the Paleolithic group showed a significantly decreased waist circumference, improved glucose sensitivity, HbA1c, diastolic blood pressure, lipid profile, weight, and waist circumference (11). Data collection from this study also showed this diet to be 10% more expensive than an essential diet of similar nutritional value. Additionally, the Paleolithic diet is low in calcium causing concern for deficiency and risk for osteoporosis (11). In another study done with focus of the Paleolithic diet effect of metabolic syndrome, greater short-term improvements on each of the five components of metabolic syndrome were evidenced with decreases in waist circumference, triglycerides, blood pressure, and fasting blood sugar and increases in HDL cholesterol (12). While the Paleolithic diet is said to be over-hyped and under-researched, there appears to be enough evidence to call for further consideration of this diet as a dietary option for management of metabolic diseases.

References:


11. **Subject Population:** Describe the characteristics of the participant population including the inclusion and exclusion criteria and the number of participants you plan to recruit:

A minimum of 300 participants, male and female college students with an age range of 18-22 years old, will be recruited to participate in this study.

12. **Recruitment Procedure:** Describe your recruitment strategies including how the potential participants will be approached and precautions that will be taken to minimize the possibility of undue influence or coercion. Include copies of the recruitment letters, leaflets, etc. in your submission.

Faculty in the Department of Nutritional Sciences will be solicited to send the survey to all students in their classes. The link will also be sent via Facebook to members of various TCU organizations. Students will receive an email containing a link to the questionnaire, which will be generated via Survey Monkey®.

13. **Consenting Procedure:** Describe the consenting procedure, whether participation is completely voluntary, whether the participants can withdraw at any time without penalty, the procedures for withdrawing, and whether an incentive (describe it) will be offered for participation. If students are used as participants, indicate an alternative in lieu of participation if course credit is provided for participation. If a vulnerable population is recruited, describe the measures that will be taken to obtain surrogate consent (e.g., cognitively impaired participants) or assent from minors and permission from parents of minors. Participants will be asked to complete a consent form and a HIPPA release form.

Two pages of consent forms will be read and agreed with before taking the survey. Participation is completely voluntary and participants can withdraw at any time without penalty, and there is no incentive offer. Course credit is not given to students if they
14. **Study Procedures:** Provide a chronological description of the procedures, tests, and interventions that will be implemented during the course of the study. Indicate the number of visits, length of each visit, and the time it would take to undergo the various tests, procedures, and interventions. If blood or tissue is to be collected, indicate exactly how much in simple terms. Flow diagrams may be used to clarify complex projects.

A three-part 32-question online survey will be administered to students who choose to take part in the research. Questions address demographics, health status, and frequency of fad dieting. Participants will be asked to fill out the online survey following consent. Survey completion should take 8-10 minutes and participation is completely voluntary. Participants can withdraw at any time without penalty. Survey data will be collected, de-identified, stored, used, and disposed to protect confidentiality. All signed consents and hard data will be stored for a minimum of 3 years in a locked filing cabinet (and locked room) in the principal investigator’s office at TCU.

15. **Data Analyses:** Describe how you will analyze your data to answer the study question.

Data will be analyzed to meet study objectives. Analyses will assess students’ history of fad dieting and outcomes, plus perceived health status based on body weight and image, eating and exercise habits, and incidence of lifestyle practices such as smoking and alcohol use. Data will be organized to determine response frequencies, descriptive statistics, and correlation between selected variables (p<0.05).

16. **Potential Risks and Precautions to Reduce Risk:** Indicate any physical, psychological, social, or privacy risk which the subject may incur. Risk(s) must be specified. Also describe what measures have been or will be taken to prevent and minimize each of the risks identified. If any deception is to be used, describe it in detail and the plans for debriefing.

The only risk that may occur is students may become more aware of their health status and eating habits. These risks will not be minimized because we need data from those questions that might provoke these thoughts.

17. **Procedures to Maintain Confidentiality:** Describe how the data will be collected, de-identified, stored, used, and disposed to protect confidentiality. If protected health information is to be re-identified at a later date, describe the procedure for doing so. All signed consents and hard data must be stored for a minimum of 3 years in a locked filing cabinet (and locked room) in the principal investigator’s office, lab, or storage closet at TCU. Your professional society may recommend keeping the materials for a longer period of time.

Data will be taken from the online survey through Survey Monkey®. It will be stored in
the Department of Nutritional Sciences in a secure location for at least 3 years. The Department of Nutritional Sciences’ staff and researchers of this study will have access to the information. All Survey Monkey® responses will remain anonymous. After three years, all surveys will be shredded to protect confidentiality of the participants.

18. **Potential Benefits:** Describe the potential benefits of the research to the participants, to others with similar problems, and to society.

Participants may become more aware of their health status and could be motivated to make healthy lifestyle changes where they see fit.

19. **Training for Protecting Human Research Participants:** Submit training certificates for all the study investigators. The training link is available on the TCU IRB webpage at [www.research.tcu.edu](http://www.research.tcu.edu).

20. **Check List for the Items That Need to be Submitted:** Please combine all the files into one pdf document before submitting the materials electronically to the IRB. To prevent any delay in the approval of your protocol, use the most recent template for the protocol, consent document, and HIPAA form by downloading them from [www.research.tcu.edu](http://www.research.tcu.edu) each time you prepare your materials.

   a. Protocol
   
   b. Consent document
   
   c. HIPAA form
   
   d. Protecting Human Research Participants Training certificate for each investigator
   
   e. Recruitment fliers, letters, ads, etc.
   
   f. Questionnaires or other documents utilized in screening and data collection
APPENDIX B: SURVEY MONKEY® QUESTIONNAIRE

Why College Students Go on Fad Diets

Texas Christian University
Fort Worth, Texas
CONSENT TO PARTICIPATE IN RESEARCH

Title of Research: Determining Why College Students Go On Fad Diets

Funding Agency/Sponsor: Texas Christian University Department of Nutritional Sciences

Study Investigators: Dr. Anne VanBeber, PhD, RD, LD (Principal Investigator), Leigh Mattson, Katie Shamoone

What is the purpose of the research? The purpose of this study is to determine reasons college students follow fad diets and which if any of those diets are perceived effective

How many people will participate in this study? A minimum of 300 people will participate in this study.

What is my involvement for participating in this study? You will be asked to complete a survey asking questions about your health status and diet history. Additionally, you will answer basic demographic questions that may impact results.

How long am I expected to be in this study for and how much of my time is required? This survey should take between 5-10 minutes to complete.

What are the risks of participating in this study and how will they be minimized? There is a chance that some participants may become self-aware of their health status and eating habits.

What are the benefits for participating in this study? Participants may become more aware of their health status and could be motivated to make healthy lifestyle changes where they see fit.

Will I be compensated for participating in this study? There is no compensation for participating in this study.

What is an alternate procedure(s) that I can choose instead of participating in this study? There is no alternate procedure for participating in this study.

How will my confidentiality be protected? Aside from the gender, age, and race/ethnicity of participants, no other identifying information will be included on the surveys provided. All hard copies of the completed surveys will be stored in the Department of Nutritional Sciences in a secure location for a minimum of three years. After three years, all surveys will be shredded to protect confidentiality of the participants.

Is my participation voluntary? Yes it is 100% voluntary.
Can I stop taking part in this research? Yes. Participants may start the survey and leave it incomplete. By doing so, their answers will not be collected. There is no penalty for not completing the survey.

What are the procedures for withdrawal? In order to withdraw from the survey students may navigate away from the page or close out of the Internet all together.

Will I be given a copy of the consent document to keep? If you would like a copy of the consent form, please email Dr. Anne VanBeber at a.vanbeber@tcu.edu.

Who should I contact if I have questions regarding the study? Please contact Dr. Anne VanBeber at 817.257.7309 or at a.vanbeber@tcu.edu.

Who should I contact if I have concerns regarding my rights as a study participant?
Dr. Dennis Cheek, Chair, TCU Institutional Review Board, Phone 817 257-6741
Dr. Tim Barth, Co-Chair, TCU Institutional Review Board, Phone 817-257-6427
Dr. Bonnie Melhart, TCU Research Integrity Office, Telephone 817-257-7104.

* 1. By selecting "I Agree" below, you indicate that you have read or been read the information provided above, you have received answers to all of your questions and have been directed who to call if you have any other questions, you have freely decided to participate in this research, and you understand that you are not giving up any of your legal rights.

☐ I Agree
PROTECTED HEALTH INFORMATION AUTHORIZATION FORM

Researchers from the study “Determining Why College Students Go On Fad Diets” would like your permission to use your health information which will be gathered as a part of this study.

The following health information will be gathered from you:
- How you rate your level of physical activity
- How your rate your eating habits
- How you perceive your current weight
- Disease/Disorder status
- How many times/week you exercise
- Smoking status
- Consumption of alcohol
- Past weight loss behaviors

The names of the TCU researchers who will gather this information from you are (insert the names of all TCU researchers starting with the lead researcher): Anne VanBeber, PhD, RD, LD (Principal Investigator), Leigh Mattson, Katie Shamoon

Your health information may be shared with others who are working with the TCU researchers on this study, institutes that are paying for this study or involved in any other way, or as required by law. The names of these other researchers (include name, affiliation, and role in the study) or institutions (name and role in the study) are listed below.

Dr. Dennis Cheek, Chair, TCU Institutional Review Board, Phone 817 257-6741
Dr. Tim Barth, Co-Chair, TCU Institutional Review Board, Phone 817-257-6427
Dr. Bonnie Melhart, TCU Research Integrity Office, Telephone 817-257-7104.

The TCU researchers and other researchers who work with TCU will protect your health information in the following ways:
- Your health information will be kept private
- Your name or any other identifying information will not be made known
- Your health information may be shown in research papers or meetings without any information about you that will link it to you.
- Your health information will be given a special code for security
- Your health information will be grouped together with other people’s health information to form an average
- Your health information will be locked in a cabinet and kept safe

You can agree or not agree to sign this form. If you agree to sign this form but change your mind,
you can choose to stop being in the study at any time. If you decide to stop being in the study, you will need to contact the researcher: Dr. Anne VanBeber, 817.257.7518, a.vanbeber@tcu.edu.

You will be given a copy of this form to keep.

If you have any questions or concerns about your rights as a study participant, you can contact:
Dr. Dennis Cheek, Chair, TCU Institutional Review Board, 817 257-6741.
Dr. Tim Barth, Co-Chair, TCU Institutional Review Board, 817 257-6427.
Dr. Bonnie Melhart, TCU Research Integrity Office, Telephone 817-257-7104.

* 2. By selecting "I Agree" below, you are saying that you understand what is being said in this form, you have been told who to contact if you have questions regarding your rights as a participant, and you have allowed TCU to gather, use, and share your health information as described in the form.

☐ I Agree
<table>
<thead>
<tr>
<th>Why College Students Go on Fad Diets</th>
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</thead>
<tbody>
<tr>
<td>3. Demographics</td>
</tr>
<tr>
<td>3. What is your gender?</td>
</tr>
<tr>
<td>- Male</td>
</tr>
<tr>
<td>- Female</td>
</tr>
<tr>
<td>- Prefer not to answer</td>
</tr>
<tr>
<td>4. Which category below describes your age?</td>
</tr>
<tr>
<td>- Younger than 18</td>
</tr>
<tr>
<td>- 18-20</td>
</tr>
<tr>
<td>- 21-25</td>
</tr>
<tr>
<td>- 26-30</td>
</tr>
<tr>
<td>- Older than 30</td>
</tr>
</tbody>
</table>
### Demographics Part 2

5. What is your race/ethnic background?
- American Indian/Alaska Native
- African American/Black
- Asian/Pacific Islander
- Caucasian/White
- Hispanic American
- Other

6. What is the native language spoken in your family at home?
- English
- Spanish
- French
- Chinese
- Other

7. Where do you live while at school?
- University/Residence hall
- Apartment/House independently
- At home with parents
- Other
8. What was the estimated total income of your family in 2016?
- Less than $25,000
- $25,000 to $49,999
- $50,000 to $99,999
- Greater than $100,000
- I do not know
- Prefer not to answer

9. In what college is your major?
- College of Science and Engineering
- College of Business
- College of Communication
- College of Education
- College of Fine Arts
- Honors College
- College of Liberal Arts
- College of Nursing and Health Sciences
- University Programs

10. What level is your university classification?
- Freshmen
- Sophomore
- Junior
- Senior
- Graduate student

11. Are you employed part-time while in school?
- Yes
- No
12. Are you currently a member of a sanctioned college athletic team?
- Yes
- No
If yes, what sport?

13. Do you participate in university intramural sports?
- Yes
- No
If yes, what sports?

14. Were you a member of an athletic team in your high school?
- Yes
- No
If yes, what sports?
### 4. Health Status

15. Using your best judgment, how do you rate your current level of physical activity?
- [ ] Sedentary
- [ ] Moderate (150 min/week moderate aerobic exercise)
- [ ] Vigorous (1 hour 15 min/week high intensity exercise)

16. Using your best judgment, how do you rate your eating habits?
- [ ] Unhealthy
- [ ] Slightly unhealthy
- [ ] Normal
- [ ] Healthy
- [ ] Very healthy

17. How do you interpret your current weight?
- [ ] Underweight
- [ ] Slightly underweight
- [ ] Normal weight
- [ ] Overweight
- [ ] Very overweight
- [ ] Obese
18. Which of the following sources influence your pressure to be a certain weight?

- [ ] Self
- [ ] Media
- [ ] Friends
- [ ] Family
- [ ] Health care professionals
- [ ] Other (please specify)

19. Do you have diabetes?

- [ ] Yes
- [ ] No
- [ ] I don’t know

20. Do you have celiac disease?

- [ ] Yes
- [ ] No
- [ ] I don’t know

21. Do you smoke?

- [ ] Yes
- [ ] No
- [ ] Sometimes

22. Do you consume alcoholic beverages?

- [ ] Yes
- [ ] No
- [ ] Sometimes
23. Which of the following weight loss behaviors have you ever consciously used to lose or control your weight?

- [ ] Consciously eat less than you want
- [ ] Count grams of fat
- [ ] Count net carbs
- [ ] Count calories
- [ ] Eat or drink low fat or fat free versions of food/drinks
- [ ] Eat or drink sugar free versions of food/drinks
- [ ] Exercise
- [ ] Measure/ weighed portions

Other (please specify)
<table>
<thead>
<tr>
<th>Why College Students Go on Fad Diets</th>
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<tr>
<td><strong>5. Fad Diets</strong></td>
</tr>
<tr>
<td>24. Have you ever followed a fad diet?</td>
</tr>
<tr>
<td>[ ] Yes</td>
</tr>
<tr>
<td>[ ] No</td>
</tr>
</tbody>
</table>


<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Fad Diets Part 2</td>
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</table>

25. Which of the following diet(s) have you followed?
- [ ] Atkins Diet
- [ ] Gluten-free Diet
- [ ] Weight Watchers®
- [ ] Paleolithic Diet
- [ ] Other (please specify)

26. Why did you follow this diet(s)?
- [ ] To lose weight
- [ ] To improve health status
- [ ] To win/participate in a challenge through work, school, friend group etc.
- [ ] Other (please specify)

27. How long did you follow the diet(s)?
- [ ] 0-4 weeks
- [ ] 1-4 months
- [ ] 4-6 months
- [ ] 6-12 months
- [ ] Over a year

28. How many times did you follow the diet(s)?
- [ ] Once
- [ ] Twice
- [ ] More than twice
29. Did you achieve your desired results?
   - [ ] Yes
   - [ ] No
   If yes, please explain why

30. After going off the diet, were your results short or long term?
   - [ ] Short term (1 week-4 months)
   - [ ] Long term (over 4 months)
   Why?

31. Please explain your experience with this diet(s)? Did you encounter any unexpected results? How did you feel during and after going on this diet?

32. Would you go on this diet again?
   - [ ] Yes
   - [ ] No
   - [ ] Maybe
   Please explain and specify which diet(s).
<table>
<thead>
<tr>
<th>Why College Students Go on Fad Diets</th>
</tr>
</thead>
</table>

33. If no to question 24, would you ever consider going on a fad diet?

- [ ] Yes
- [ ] No
- [ ] Maybe

Please explain

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Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that Alicia Mattson successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 08/27/2016.

Certification Number: 2137376.
APPENDIX D: EVIDENCE ANALYSIS LIBRARY CERTIFICATE