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# A Mobile-Based Intervention for Obesity Prevention Among Female College Students in Saudi Arabia: A Randomized Controlled Trial

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# A MOBILE-BASED INTERVENTION FOR OBESITY PREVENTION AMONG FEMALE COLLEGE STUDENTS IN SAUDI ARABIA: A RANDOMIZED CONTROLLED TRIAL

A dissertation submitted in partial fulfillment

of the requirements for the degree of

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in

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by

Abeer Hussain Alssafi

2018

To: Dean Tomas R. Guilarte
Robert Stempel College of Public Health & Social Work

This dissertation, written by Abeer Hussain Alssafi, and entitled A Mobile-Based Intervention for Obesity Prevention among Female College Students in Saudi Arabia: A Randomized Controlled Trial, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Date of Defense: November 9, 2018

The dissertation of Abeer Hussain Alssafi is approved.

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Vice President for Research and Economic Development
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Florida International University, 2018

## DEDICATION

I dedicate this dissertation to my parents, who supported me reach the highest level of education. They have always supported me tremendously in my educational pursuits, no matter what my age or degree choice. This dissertation is also dedicated to my amazing major professor Dr. Catherine Coccia, who never gives up on me. Without her patience, understanding, and support, the completion of this work would not have been possible.

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ABSTRACT OF THE DISSERTATION

A MOBILE-BASED INTERVENTION FOR OBESITY PREVENTION AMONG FEMALE COLLEGE STUDENTS IN SAUDI ARABIA: A RANDOMIZED CONTROLLED TRIAL

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Professor Catherine Coccia, Major Professor

College students transitioning from adolescence into early adulthood may encounter new stresses, which may lead to unhealthy weight-related behaviors and weight gain. Students gain approximately 4-9 pounds during their first 2 years in college. Health behaviors in this population pose an increased risk because they tend to persist into adulthood. In Middle Eastern countries including Saudi Arabia, student obesity is on the rise. About 24% of female college students were overweight or obese in Saudi Arabia in 2015. This dissertation describes the development of a mobile intervention program using Instagram and a self-tracking app to minimize the risk of overweight/obesity in Saudi Arabian female college students by changing health behaviors, including increasing fruit and vegetable intake along with physical activity.

More than 100 students were randomly assigned to either the control or the mobile intervention group. Students in the intervention group were asked to participate in the study Instagram account by adding comments, likes, and sharing the post in an effort to

increase social support for healthy eating and physical activity habits for 6 weeks. Each day was focused on 1 topic: general nutrition, fruits and vegetables intake, physical activity, social support, and self-efficacy. These topics were driven from social cognitive theory. Finally, students were asked to input their diet and daily activity into a self-tracking app. Measures were taken three times during the study: pre and post intervention and at follow-up.

While the study was not long enough to detect the changes in body weight and physical activity, it did find that the intervention significantly increased fruit and vegetable intake. A small interaction effect was found between the two groups where the intervention group increased fruit and vegetable intake, while the control group decreased their intake of fruit and vegetables. Additionally, repeated measures ANOVA indicated significant differences between the groups in nutrition knowledge, family social support and exercise, and increase in eating and exercise self-efficacy.

The promising results of this study provide support for further evaluation of the program. Future studies are needed to better understand the factors that serve as motivation and predict weight loss success among college students.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| APP | Application |
| BMI | Body Mass Index |
| BW | Body Weight |
| CVD | Cardiovascular Disease |
| CG | Control Group |
| FIU | Florida International University |
| IG | Intervention Group |
| KSA | Kingdom of Saudi Arabia |
| MMM | My Meal Mate |
| PA | Physical Activity |
| PNU | Princess Nourah bint Abdulrahman University |
| RCT | Randomized Controlled Trial |
| SA | Saudi Arabia |
| SCT | Social Cognitive Theory |
| SM | Social Media |
| T2DM | Type 2 Diabetes Mellitus |
| WC | Waist Circumference |
| WHO | World Health Organization |

# CHAPTER I

# INTRODUCTION

## Obesity Rates in the Kingdom of Saudi Arabia

Obesity rates are increasing in the Kingdom of Saudi Arabia (KSA), and is one of the leading causes of lifestyle-related diseases such as cardiovascular diseases (CVDs), type 2 diabetes mellitus (T2DM), and some types of cancer.[1] During the past 30 years, the number of overweight and obese individuals has tripled.[2] In 2013, the Saudi Ministry of Health, in collaboration with the Institute for Health Metrics and Evaluation reported that obesity rates among adult women and men were 33.5% and 24.1%, respectively, with a societal average of 28.7%.[3]

Adopting Western dietary habits involving overconsumption of high fat foods, sugar, salt,[2,4] fast foods, sugar-dense beverages (e.g., sodas), and foods outside the home have increased the prevalence of overweight/obesity in KSA.[5] Additional dietary changes such as decline in the intake of fruits, vegetables, whole grains, and legumes have increased the problem.[2,4] In addition, people in KSA are not consuming enough fruits and vegetables, except for dates.[6] It was reported that only 2.6% of Saudis aged 15 years or older met the United States Centers for Disease Control (CDC) guidelines.[7] The CDC recommends 2 cups of fruits for adult men and women ages 19-30 years. It also recommends 2½ cups of vegetables for adult women and 3 cups for men ages 19-30 years.[6] The World Health Organization (WHO) and the Food and Agriculture Organization (FAO) reported that consuming at least 2½ cups of fruits and vegetables per day may prevent chronic diseases such as obesity and its comorbidities.[8]

In addition to the changes in dietary habits, a high prevalence (43.3–99.5%) of sedentary behavior has been observed in KSA.[9,10,11] Technological advances (cars, escalators, elevators) and an increase in screen time have contributed to more sedentary lifestyles.[12] The World Health Organization (WHO) recommends that adults ages 18–64 years participate in > 150 minutes of moderate-intensity aerobic physical activities (PA) per week, > 75 minutes of vigorous-intensity aerobic PA per week, or an equivalent combination of moderate- and vigorous-intensity activity to reduce the risk of lifestyle diseases.[13] However, many adults do not meet the WHO's PA guidelines. In 2013, an estimated 4.5 million (34.5%) Saudi Arabian (SA) individuals > 15 years were physically inactive, while only 1.7 million (12.9%) met the recommended levels of moderate-intensity aerobic PA per week.[14] An additional 3.4 million (25.8%) practiced low levels of PA and only 3.5 million (26.8%) Saudi Arabian adults met the recommended level of vigorous PA.[14]

**Obesity and Young Adults**

An important time for the development of health behaviors is during emerging adulthood, which is typically coupled with the transition to college.[15] Despite the importance of this time period for health behavior development, college is a time period full of new stresses, which often times lead to unhealthy weight-related behaviors and weight gain.[16] In fact previous studies have reported that college students gain approximately 4-9 pounds during the first 2 years.[17] In the Kingdom of Saudi Arabia **(**KSA), in 2015, Khalaf et al. reported that 23.8% of female college students were

overweight or obese.[18] Not consuming enough fruits and vegetables and insufficient physical activity are main leading reasons for the development of obesity among Saudi women.[18] This is a critical health behavior, which requires interventions to prevent long-term obesity related health problems.

**Significance of the Problem**

Obesity is one of the leading causes of chronic diseases including diabetes and cardiovascular diseases. The Kingdom of Saudi Arabia has high rates of obesity in both the general population but also in young adults, females in particular. Despite the critical nature of health behavior development in emerging adulthood, coupled with high rates of obesity in KSA, cost-effective obesity prevention programs are lacking, especially for female college students. Therefore, there is an urgent need to develop a cost-effective lifestyle intervention for prevention and control of obesity that is targeted at female college students in KSA.

Mobile-based interventions have been suggested as a convenient and cost-effective way to provide nutrition education for college students.[19] Compared to face-to-face methods, mobile-based interventions are potentially more convenient for both participants and providers, as mobile applications (apps) can be accessed at any point in time. Yet, there is insufficient evidence on whether social media (SM) or weight loss apps work for weight loss or obesity prevention. Thus, the purpose of the current study is to examine the acceptability and initial efficacy of a mobile-based intervention to increase fruit and vegetable intake and physical activity (PA) in female college students in KSA as an obesity prevention technique.

The current study has several strengths. First, it focuses on an age and gender group, female college students, who has high obesity prevalence and are on their phones more than any other group. In 2016, it was reported that the average Saudi college student uses their phone 330 min/day, and duration was significantly higher in females.[20] Second, this study utilized the social media (SM) Instagram, through which users may benefit from receiving health information, social support, and motivation. Instagram is one of the most popular social media apps in KSA. In 2016, it was reported that there were 3.1 million Instagram users in KSA and 90% of them were between the ages 18-44 years.[21] A recent study reported that young adults use SM to seek health-related social support from people within their social network.[22] Another study recognized that social interaction via SM could affect food choices and quantities among young adults.[23] Third, the intervention developed and utilized in this study has a strong theoretical foundation based on Social Cognitive Theory (SCT). Finally, the current study is incorporating a self-tracking app, which has been shown to be beneficial in reducing body weight.[24,25]

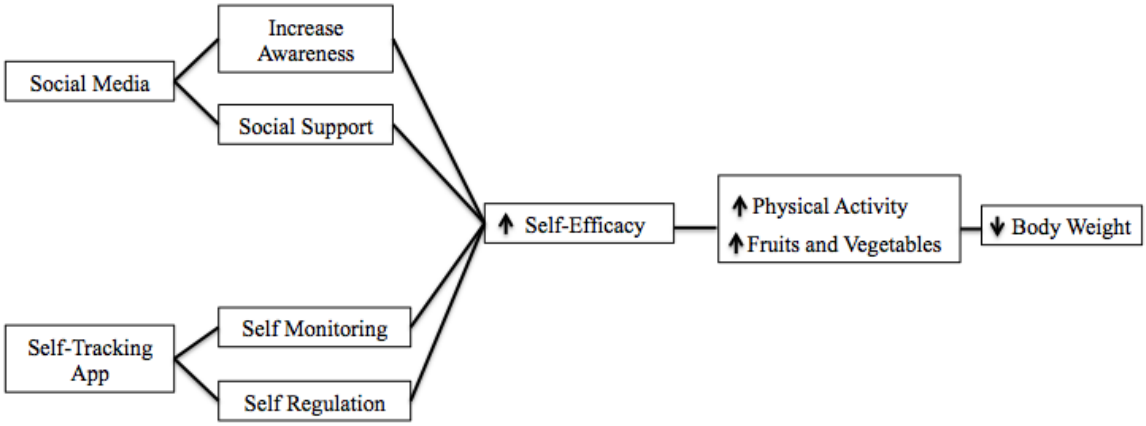
## Theoretical Perspectives

In order to guide behavioral change in the current study, Bandura's Social Cognitive Theory (SCT) was used as guide. This theory states that there is a reciprocal influence on behavior, which is influenced by intrapersonal factors (i.e., cognitive processes, affective processes, and biological events) and the physical and social environment.[26] Self-efficacy, especially, is hypothesized to mediate the influence of intrapersonal factors that may influence learning and subsequent behavioral change. To increase self-efficacy, strategies should be aimed at improving goal achievement by

increasing awareness, social support and self-efficacy. New technologies such as SM and self-tracking apps, as reviewed previously, may be capable of increasing self-efficacy to generate positive health behaviors in young adults (Figure 1).

Figure 1.

*Integrating Social Cognitive Theory into the components*




## Statement of the Problem

Few researchers have looked at the effects of mobile-based interventions on preventing weight gain. Research needs to provide evidence-based endorsement for such interventions in changing behaviors among female college students. Thus, the overall purpose of this six-week randomized clinical trial (RCT) was to develop and examine the feasibility of an obesity-prevention program delivered by SM (Instagram) and a mobile self-monitoring app (mDiet) among female college students in KSA. The key behavior change theory that supports the study is Bandura's social cognitive theory, which has been previously used to improved diet and physical activity behaviors and resulted in a substantial body weight reduction.[27]

**Specific Aims and Hypotheses:**

1. Develop a SM+Tracking intervention based on social cognitive theory.
2. Examine the role of SM on college students eating behaviors.
3. Examine the implementation feasibility and promise of a SM+Tracking intervention to change college students obesogenic health behaviors (increase fruit and vegetable intake & PA).

- ***Feasibility***
  - **Feasibility 1:** Feasibility of the research design will be demonstrated by baseline recruitment of 100 students, assuming 60% retention (with complete data) at post-test and 50% retention (with complete data) at follow-up.
  - **Feasibility 2:** Feasibility of the intervention will be demonstrated through the number of likes, comments, and share in Instagram and strong satisfaction with intervention goals, content and format.

- ***Hypotheses***

  ***The following hypotheses were tested:***

  - **Hypothesis 1:** There will be a difference between the control and the intervention group in terms of change mediators based on social cognitive theory. The intervention group will report higher nutrition knowledge, family and friend social support for eating and exercise, self-efficacy for eating and self-efficacy for exercise than the control group post intervention.
  - **Hypothesis 2*:*** A combination of social media and self-monitoring app will significantly increase fruits and vegetables intake among Saudi Arabian female college students.

- **Hypothesis 3*:*** A combination of social media and self-monitoring app will significantly increase physical activity among Saudi Arabian female college students.
- **Hypothesis 4*:*** A combination of social media and self-monitoring app will significantly prevent weight gain among Saudi Arabian female college students.

# CHAPTER II

# LITERATURE REVIEW

## Obesogenic Behaviors in Young Adults

The transition to college usually happens between ages of 18 to 24 years. It has been recognized as a critical time for substantial and rapid weight gain as a result of poor dietary habits.[15,28] Many college students engage in unhealthy dieting, meal skipping, and fast food intake as a result of their hectic schedules and the newly gained freedom from parental influence.[29] Studies have found that college students gain weight at an alarming rate,[30,31] equaling roughly 2 pounds per year.[17] Another study reported that college students are likely to gain 4–9 pounds in the first 2 years of college.[17] These years play an essential role in the development of health habits that continue into adulthood.[32] As such, overweight/obese college students are at higher risk to become overweight adults[33] and are at a higher risk for lifestyle-related diseases such as CVDs, T2DM, some cancers, and hypertension.[34] Because of this, it is important to develop programs to encourage healthy weight-related behaviors for at-risk college students.

## Mobile-Based Intervention

Compared to face-to-face methods, mobile-based interventions are considered cost-effective for weight-loss. Using mobile platforms to deliver health information may also be convenient for students because they can receive the intervention at any time using technology that has been integrated into their daily lives. Although limited, current studies have used SM and self-monitoring apps to improve weight-related behavior and have found positive results. For example, SM was shown to be effective in reducing body

weight (BW) among college students[19] and seemed to be a promising way to increase PA in other studies.[35,36] Furthermore, several studies found that using self-monitoring apps led to BW reduction[24,25,37-39], PA improvements,[25,39] and increased fruits and vegetable intake.[40] Despite these positive results, to date studies have not used SM and self-monitoring apps together that are driven by nutrition educational theory to prevent obesity in a KSA population.

**Social Media in Young Adults**

Social media such as Instagram, Facebook and Twitter has become a popular communication platform especially among young adults ages 18–25 years in KSA.[41] This age group has been found to spend more time on SM than any other activity.[42] It has been reported that they spend between 11 to 12 hours each day using technology and SM.[43,44] In 2014, 89% reported utilizing SM, 67% accessed SM on their smartphones,[45] and 79% were active SM users.[46]

**Instagram**

When examining social media Instagram (a popular SM app), it was reported that there were approximately 3.1 million users in KSA and 90% of them were ages 18-44 years old in 2016.[21] Instagram was launched in 2010 by Kevin Systrom and Mike Krieger. This is a free online mobile app that enables its users to take pictures and videos, then share them either publicly or privately.[50] Instagram has become popular in KSA with an estimated 8.8 million users in 2015.[47] It was estimated that 90% of the users were between the ages 18–29 years.[45] It has also been estimated that Saudis post an average of 12 photos on Instagram each week.[47] It is clear that SM has become a normative aspect of

young adult life.[33] Interestingly, SM has become a crucial source of health information[40] and young adults believe that SM could be used to improve behaviors.[41] SM interventions have been shown in some studies to be effective in reducing BW among college students[19,36] and could be a promising method for increasing PA among female college students.[35]

## Social Media and Weight-Related Behaviors

Recently, SM has become a crucial source of health information.[48] Vaterlaus et al.[41] found that SM could be a motivator to change weight related behaviors among young adults. These authors emphasize the importance of finding ways to use SM as a tool to distribute exercise and nutrition advice, along with inspirational quotes to motivate people to improve their lifestyles.[41] Several studies have used SM to change health behaviors specifically related to weight loss.

In 2013, Napolitano and colleagues[19] performed a randomized clinical trial (RCT) among 52 college students ages 18-29 years, most of whom were Caucasian (~58%), and 32.7% of were sophomores. They assigned the students into the following groups: Facebook, Facebook plus text messaging and personalized feedback, and control group (CG). The Facebook group received weekly handouts and podcasts via a private Facebook page along with access to healthy activities. In addition to the private Facebook page, the group that used Facebook, text messaging and personalized feedback received additional theoretically driven intervention targets through text messages; these were focused on goal setting, self-monitoring, and social support communications. The second group received a pedometer, *Calorie King* book, measuring utensils, a digital scale, daily

text messages, and personalized feedback. At 4 and 8 weeks, the Facebook plus group experienced the greatest weight loss at ~-1.7 kg and ~-2.5 kg, respectively. The changes in BW among the groups were statistically significant. Although the study was conducted with a small number of participants and only for a relatively short time period, it showed that Facebook, when combined with additional components such as self-monitoring, social support, and personalized goals was more effective in reducing BW than Facebook alone.

Another study examined the social networking website Twitter. In this study, however, Twitter was not effective in reducing BW in 96 overweight and obese adults ages 18-60 years.[49] Subjects were randomly assigned to either a Podcast or Podcast+Mobile group. All study participants had access to a group-specific Podcast site. During the first 3 months, both groups received two Podcasts weekly (15 minutes each). During the second half, the two groups received 2 minipodcasts weekly (5 minutes each). Additionally, the intervention group was asked to download a FatSecret's Calorie Counter app and Twitter to their mobile device and encouraged to post at least daily to Twitter. The control group received a book with the calorie and fat contents of food to help in monitoring dietary intake. After 6 months, the researchers observed minimal weight changes in both groups (~0.25 kg) without a difference between the groups.

In 2013, Valle et al. randomly assigned 66 young adult cancer survivors into two groups.[36] They found that adding personalized goals to Facebook was more effective in reducing BW in young adult cancer survivors ages 21-39 years compared with just adding Facebook messages related to changing behaviors and social interaction.[36] The majority of the participants were college graduates and non-Hispanic. The Facebook plus

personalized goals group lost about 2.7% of their BW and had lost an estimated 2.1 kg compared to no significant weight loss in the Facebook without adding the other components (−0.1 kg). Differences in weight changes between groups approached significance (p= 0.083). Moreover, The CG received Facebook messages related to PA every week, a Digi-Walker SW-200 pedometer, and had access to a private Facebook group page to socially interact. In addition to what the CG received, the IG received the same Facebook component, with additional access to a website offering tips on setting short-term and achievable physical activity goals; their Facebook page also had a moderator. After three months, increase in light PA was 135 min/week significantly greater in the IG relative to the CG. Interestingly, both groups in the study used Facebook and they both experienced significant increased in moderate-to-vigorous PA. This might be because the study was done among cancer survivors who were probably more motivated than healthy people.

Lastly, Cavallo and colleagues examined the efficacy of Facebook in conjunction with PA and a self-monitoring website in 134 undergraduate female students.[35] In this study, 92% of participants were non-Hispanic, with 73% identifying as white, and 79% reported having parents who had attained college or higher levels of education. Subjects were randomly assigned to a control group (only received access to a PA-focused website) or an intervention group (received access to the same website with the addition to PA self-monitoring and Facebook group invitation using existing accounts). After 12 weeks, an increase in PA was found in the intervention group. Yet, no PA differences between groups were observed. The use of a self-report PA measure and short duration time could have affected the results.

## mDiet app

Thought there are a variety of self-tracking apps that target diet and PA, mDiet is the only self-monitoring app that targets Arab population. mDiet provides a database of thousands of Mediterranean foods. It lets users enter their current BW, goal BW, and goal rate of BW loss. It shows the users a daily and weekly report of their daily dietary intake.

## Mobile Based Weight-Loss Apps / Self Monitoring Apps:

It has been reported that self-monitoring, regardless of the methods, can lead to weight loss success[19,36,38] and improved PA.[36] Today with the expansion of mobile health tracking apps, studies have been conducted to investigate whether these self-monitoring platforms have a role in improving health behaviors. Several studies have found positive results when self-tracking apps were part of a BW reduction program.

For instance, in 2015, Fukuoka et al. [25] conducted a RCT in 61 overweight adults (>35 years of age) at high risk for diabetes. Participants were mostly female (77%) and more than half of them were white non-Hispanics (52.5%). The CG received pedometers and a National Institute of Diabetes and Digestive and Kidney Diseases brochure about pre diabetes. The IG used a mobile app modified from the original Diabetes Prevention Program, received a pedometer and were required to attend 6 in-person sessions. After 5 months, significant differences between the groups were observed. The IG had a greater reduction in BW (~-6.2 kg), hip circumference, blood pressure, and intake of saturated fat. McCarroll et al. [24] also indicated that a self-monitoring app could be beneficial in reducing BW. They included 50 overweight/obese cancer survivor non-Hispanic women ages 18-75 years and asked them to log in their food choices, exercise type and duration,

and BW daily. After a month of using the "Lose It" app, significant loss were found in anthropometrics between pre- and post-intervention body weight (105.0 kg vs 98.6 kg), body mass index (BMI) (34.9 kg/$m^2$ vs 33.9 kg/$m^2$), and waist circumference (WC) (108.1 cm vs 103.7 cm).

Carter et al.[37] and Hebden et al.[39] were able to detect the efficacy of self-monitoring apps in reducing BW. Carter and colleagues[37] included 128 overweight adults ages 18-65 years and assigned them into three groups using the following resources, respectively: My Meal Mate (MMM) app, Weight Loss Resources website, and paper diary groups. Participants were mostly white (91%) and female (77%). All participants were provided access to an Internet forum for social support. The MMM group showed the greatest significant weight reduction after 6 months (-4.6 kg), when compared to the website group (-3.3 kg), but not when compared to the diary group. Similar findings were observed in a 12-week RCT pilot study among 51 female and male university students, ages 18-35 years.[39] In the Hebden et al.[39] study, all participants received printed diet booklets. The IG received additional components: four text messages per week, four e-mails per week, and had access to smartphone apps and Internet forums. A significant reduction of -1.6 kg was found in the IG. Though the 2 studies did not find significant differences in BW between the comparison groups, they found that using self-monitoring apps significantly improved BW.[37,39]

Another study by Laing and colleagues[50] found significant weight loss resulting from the use of the MyFitnessPal app for 6 months among 212 overweight adults although they did report a minimal weight change. Participants were 18 years or older and were mostly white females. Participants in the IG were asked to use the app and they

received a phone call from the researchers once a week to assist with any technical issues they may have experienced using the app. The participants in the CG were asked to choose any activity they liked to reduce their BW and were informed that they were participating in a weight loss app study, but were not given the name of the app being studied. After the intervention, the investigators asked the CG if they used the examined app anytime during the intervention. They found that the CG used the app during the study and that may have impacted the results.

Three studies looked at PA specifically as a result of the self-tracking intervention.[24,25,39] Two found significant increases in PA,[25,39] while one could detect the difference between the groups in the first week only.[24] The studies' own self-reported apps found a significant increase in light intensity activity (34 min/day),[39] increase in daily steps by 2551,[25] and time spent doing PA (182.3 min/day).[24] All studies were of short duration, and included a small sample size.

In terms of fruits and vegetables intake, a pilot prospective study examined the efficacy of using the MyPlate app among 150 college students.[40] The participants were full-time undergraduate students and mostly white (90%). The intervention group received messages from the MyPlate app twice weekly. The control group received the exact same information in a mailed brochure at the beginning of the study. After 7 weeks, the intervention group experienced a significant increase in fruits and vegetables intake. Despite the positive results with the MyPlate app, dietary intakes were self-reported and the researchers did not validate food consumption.[40] This could lead to under and/or overestimating the food intake.

## Summary and Conclusions

Based on our review of the literature to our knowledge this is the first study to examine the use of a mobile-based intervention in KSA, where the number of smartphone users is increasing.[51,52] Without intervention or monitoring strategies, this population is experiencing a more sedentary lifestyle. The results from the literature reviewed indicate that SM and weight-loss apps are feasible options by which to promote positive weight-related behaviors. In summary, all SM reviewed studies were done in the USA between 2011 and 2012. Of the included SM-based RCTs, two reported comparisons of BW,[49], one reported comparisons of PA,[35] and one reported comparisons of BW and PA.[36] While Twitter was not effective in reducing BW, Facebook was found to be effective among college students[19] and approached significance among young adult cancer survivors.[36] When comparing a Facebook group with non Facebook group, Facebook group increased PA.[35] Yet, when comparing two Facebook groups with additional components, results showed increases in PA in both groups.[36] Future research is needed to learn more about the potential benefits and challenges associated with SM on young adult health behaviors. On the other hand, 7 articles were examined that used different self-monitoring apps. Changes in BW were observed with the use of MMM,[37] Lose It,[24,38] and studies' own self-monitoring apps.[25,39] Three studies looked at the efficacy of such apps in improving PA.[24,25,39] The common study limitations included small or insufficient sample size and short duration (1–6 months). Thus, future studies with larger sample size are needed to test the potential use of such apps in changing individual's health behaviors.

# CHAPTER III

# METHODOLOGY

The purpose of this study was to develop and examine the feasibility of an obesity-prevention program delivered by SM (Instagram) and a mobile self-monitoring app (mDiet) among female college students in KSA.

## Design

Several reviewed mobile-based studies have used a RCT design and found positive results on improving BW and PA.[4-6] Thus, the current study was a RCT with a 6-week intervention period and 4-week follow-up. Based on a previous study that used SM-based intervention for 4–8 weeks gave significant BW reduction among college students.[19] Additional studies used self-tracking apps found significant improvements in anthropometrics (BW, BMI, WC)[24] in four weeks and increased fruit and vegetable intake in seven weeks.[40]

## Sample

a) **Recruitment:**

Participants were screened and recruited from Princess Nourah bint Abdulrahman University (PNU), Riyadh, KSA. They were recruited for two weeks in February 2018. The university emailed the professors to facilitate the recruitment. This allowed the primary investigator to ask faculty members for permission to recruit within targeted classrooms. Recruitment was also done in the student center where students from different departments gather. Interested students provided their contact information to the primary investigator and were given a recruitment flyer (Appendix1).

Prior to the intervention, the primary investigator emailed interested students to come to an information session for the study. At the information session students were provided with a more detailed description of the study, eligibility was assessed through a quick questionnaire, eligible students were asked to sign consent forms (Appendix 2&3), and anthropometric measurements were recorded. This study approved at Florida International University (Appendix 4) and PNU Institutional Review Board (Appendix 5).

**b) Sample Size**

Students were included if they met the eligibility criteria. Inclusion and exclusion criteria are shown in Table 1. A total of 135 female college students who were eligible, of whom 103 (72.3%) enrolled in the study and were randomized into two groups. Figure 2 presents flow chart of study participants through recruitment, intervention, and follow-up.

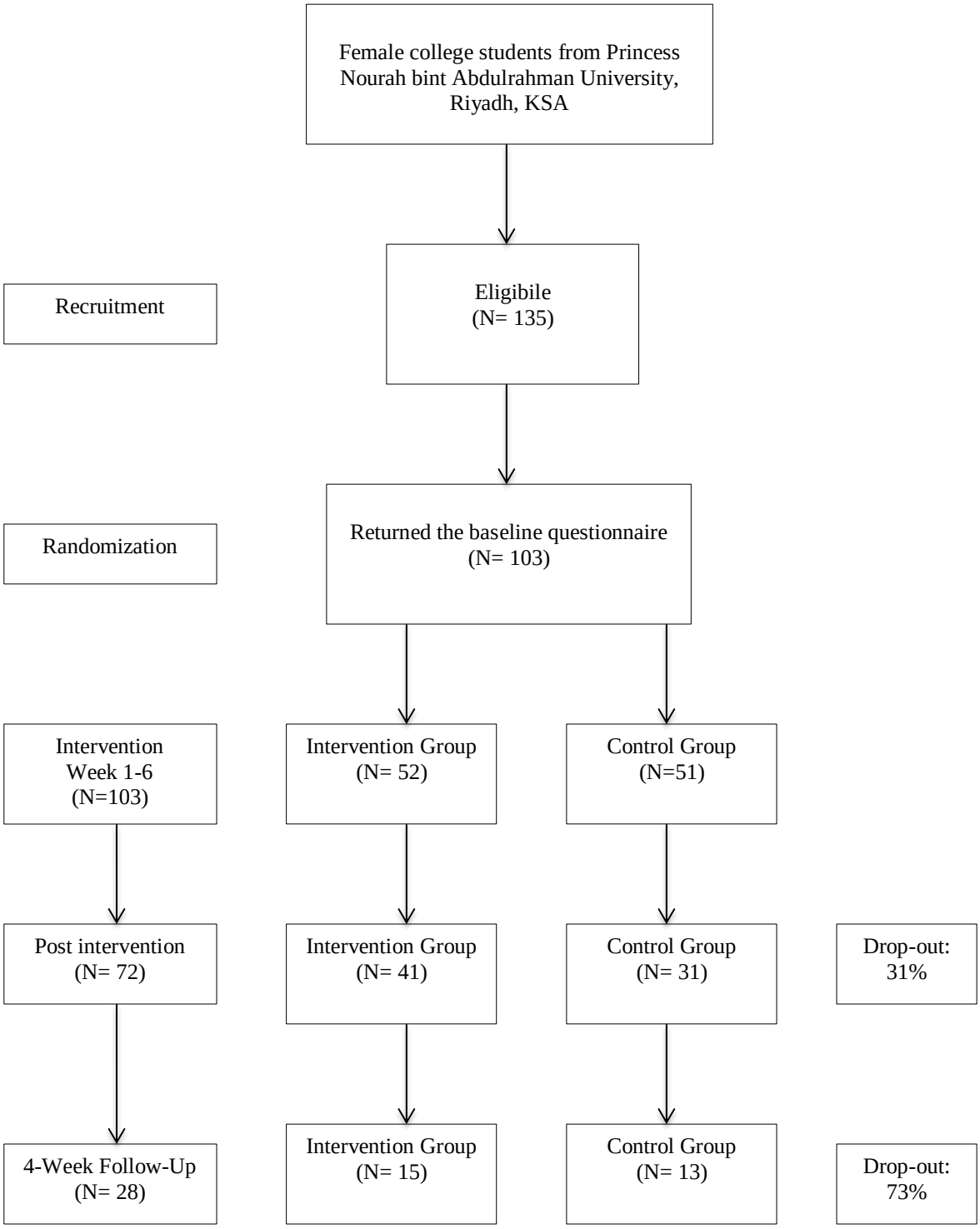
Table 1.

*Eligibility Criteria*

| Inclusion Criteria | Exclusion Criteria |
|---|---|
| College students | Not meeting the inclusion criteria |
| Have been weight stable (+/- 5 Ibs) for the past 6 months | Lack of interest in improving lifestyle behaviors |
| Own a smart phone and are not using a weight loss app on the phone | Pregnancy or intention to become pregnant within the next 3 months |
| Having access to the Internet | |

Figure 2.

*Flow-Chart of Study Participants*



**Randomization**

Subjects who met the eligibility criteria and completed the baseline survey were randomly assigned to either a control group (CG) or intervention group (IG). A computer program was used to randomize the participants. The intervention started at the beginning of February 2018 and ended in the middle of March 2018. The intervention was 6 weeks long and followed by a 10-week follow-up. Participants met with the primary investigators at baseline and post-intervention to obtain anthropometric measurements. Follow-up data were collected via an online survey since the University was closed for summer vacation.

- ***Control Group:***

The control group students provided consent to be in the study prior to randomization. Participants met the investigator twice during the study to measure their anthropometrics and to receive the survey link via email. The control group participants received fitbits (Appendix 6) when they came for the second session.

- ***Intervention Group:***

Participants in this group received a direct message to inform them they were in the intervention group along with instructions for how to participate in the intervention. They also received fitbits when they came for the second session.

**Intervention Development**

**a) Program Theory**

Strategies based on social cognitive theory have been embedded into the study design aimed at increasing awareness, social support, self-monitoring, and self-regulation

(Table 2). Goal setting, which is a SCT component was used in the study as a proxy for self-regulation.

Table 2.

*Key Constructs of Social Cognitive Theory*

| SCT Construct | Definition | Intervention Component | SM | Self-Tracking App |
|---|---|---|---|---|
| **Increase Awareness** | Emphasizes awareness of the different aspect of the self, including traits, behaviors, and feelings | Nutrition and PA information posted | X | |
| **Social Support** | The perception that others care and are willing to assist an individual; involves being a member of a supportive social network | Provide social support through interaction with friends and participants | X | |
| **Self Monitoring** | The ability to regulate behavior to accommodate social situations. | Promote data input and tracking | X | X |
| **Self Regulation** | Regulating and monitoring individual behavior. | App notifications at specific times to remind students to track their intake of fruit and vegetable | X | X |
| **Self Efficacy** | Confidence a given individual feels when engaging in a particular behavior. | Help with encouragement and social modeling<br>Help set realistic goals | X | X |

## Social Media: Instagram

**Instagram** is the social networking tool that was utilized in this study due to its ease of use and popularity. Social support is thought to be a key component in behavioral weight-loss programs.[53] Instagram can be used as a venue to deliver prompts from the program and allow subjects to support each other during their weight-loss efforts. In the current study, Instagram was used to deliver nutrition and PA information via posting pictures and/or videos.

Before the intervention started, a logo was created based on the purposes of the study "Challengeyourhealth42" (Appendix 7 & 8). In addition consistent with the social media formatting, the hashtag #Challengeyourhealth42 was created to be used in the study in order for the group to study content and design. Instagram posts were developed and created explicitly utilizing Social Cognitive Theory constructs in order to promote behavior change in participants. The goals of the social media posts were to increase participant fruit and vegetable consumption and physical activity. Each day of the week the study focused on 1 topic from Sunday through Thursday. For a full list of topics and prompts please see Appendix 9. Sunday is the first day of the week in KSA. A day before the intervention, the primary investigator posted in the study Instagram account a welcome message, a reminder about respectful Instagram communications and the importance of maintaining confidentiality.

During the Intervention, the project account posted 1-2 pictures per day that participants were able to interact with by adding comments, liking, and sharing the post in an effort to increase social support for healthy eating and PA habits. Table 3 presents Instagram weekly topics. Every post was translated to Arabic. Students were asked to log

on through their mobile device at least once daily to read messages posted and encouraged to "like," "share," or "comment." There was a challenge every week during 6 weeks. Whoever won the challenge received a $25 gift card from Amazon. In addition, the investigators used "stories" feature within the Instagram app to remind the students to use the mDiet (self-tracking app), to provide additional social modeling of some investigator and students' health behaviors, to allow students to vote for the challenge winner and to post the challenge winner's picture.

Table 3.

*Instagram Daily Topics*

| | **Topic** |
|---|---|
| **Sunday** | General nutrition |
| **Monday** | Physical activity |
| **Tuesday** | Fruits and vegetables |
| **Wednesday** | Social support |
| **Thursday** | Self-regulation |

**Self-Tracking App:**

In addition to Instagram, the IG received instructions by phone regarding how to access and download the mDiet. In the current study, participants were asked to set realistic weight maintenance or weight loss goals such as 0.5 to 2 lbs per week. These goals allowed participants to enhance their *self-regulation* and set goals on a standard measure of the mDiet app.[54] The *self-monitoring* feature of the app, consisting of recording dietary intake, PA and weight, has shown a strong correlation with weight loss.[55] Moreover, a recent pilot study demonstrated that adherence to diet *self- monitoring*

is higher among subjects using a smartphone app compared to subjects utilizing a paper diary.[37] Table 4 explains how mDiet incorporates SCT components.

Table 4

*How mDiet incorporates SCT components*

| Theory Component Targeted | mDiet |
|---|---|
| **Self Efficacy** | Provides feedback on daily walking |
| **Self Monitoring** | Allows participants to monitor their fruits and vegetables intake |
| **Self Regulation** | Allows setting weekly health behavior change goals |

Using mDiet participants set a weight loss goal and self-monitored their daily fruit and vegetable intake. The intervention goals for consumption of fruit and vegetable were based on the WHO/FAO[8] or CDC[6] recommendations. For the prevention of obesity, WHO/FAO recommends intake of a minimum of 2 ½ cups of fruit and vegetable per day.[8] The CDC recommends 2 cups of fruits and 2 ½ cups of vegetables for adult women ages 19-30 years.[6] No other restrictions in fat or calories were emphasized by the intervention. Participants selected the fruit and vegetables they consumed from a database and logged items in an electronic food diary. Furthermore, they received motivational reminders via Instagram direct message or the story feature. Students were asked to take a screenshot from the mDiet app of their daily intake and send it via Instagram direct message to the study account. Those who did not send their daily report for three days received a phone call from the researcher to remind them.

**Outcome Measures:**

In addition to the demographic variables (age, marital status, number of children, major, university level, and GPA) that were measured at baseline, several other measures were used in the current study. Table 5 represents the assessments used to evaluate intervention components.

Table 5.

*Table of Assessments*

| Assessments | Intervention Weeks | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Screen** | **Baseline** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **Assessment Tool** |
| **Informed consent** | | X | | | | | | | | | | | | |
| **Anthropometric measurements (Height, weight, BMI, WC)** | | X | | | | | | X | | | | | X | Height: stadiometer<br>Weight: digital scale<br>WC: standard tape |
| **Dietary Intake** | | X | | | | | | X | | | | | X | Food Frequency Questionnaire |
| **PA** | | X | | | | | | X | | | | | X | Godin Leisure-Time Exercise Questionnaire[60] |
| **Satisfaction** | | | | | | | | X | | | | | | Likert scale |
| **Awareness** | | X | | | | | | X | | | | | | General Nutrition Knowledge Questionnaire[55] |
| **Self-Monitoring** | | | X | X | X | X | X | X | | | | | | Screen shot |
| **Self-Regulation** | | | X | X | X | X | X | X | | | | | | Checking of participants' progress and goals |
| **Social Support** | | | X | | | | | X | | | | | X | The Sallis Social Support Scale[56,57] |
| **Self-Efficacy** | | | X | | | | | X | | | | | X | -Weight Self-Efficacy Questionnaire[57]<br>-PA Self-Efficacy Questionnaire[58] |

**Feasibility:** At post intervention.

- ***Instagram:*** Feasibility was measured by the number of study-related likes on Instagram by participants similar to a previous study done among college students.[19]
- ***Satisfaction with Research Design:*** Participants were asked to rate their satisfaction with the intervention content, design and format using Likert scale responses (1= complete disagree to 7= complete agree). The Likert scale was developed by the investigators (Appendix 10).

**Mechanisms of Action:** Surveys were collected at the baseline, post intervention, and follow-up.

- ***Awareness (knowledge):***

  Nutrition knowledge was measured using General Nutrition Knowledge Questionnaire.[55] The questionnaire was modified based on the topics that used in the study and reliability was $\alpha$=0.8 (Appendix 11). Moreover, nutrition knowledge was also measured using a questionnaire that was created by the investigator based on the study components with the reliability of $\alpha$=0.8 (Appendix 12). This questionnaire was given to both groups post intervention.

- ***Social Support:***

  Social support was measured using The Sallis Social Support Scale, which measure social support for diet[56] and PA[57] behaviors. The scale consists of 2 parts, in which 20-items assess the degree to which family (10 items) (Appendix 13) and friends (10 items) (Appendix 14) are sources of support

specific to dietary behaviors. Part 2, consists of 26 items assess that degree to which family (13 items) (Appendix 15) or friends (13 items) (Appendix 16) are sources of support specific to physical activity .The scale scores ranged from 1 (never/not applicable) to 5 (very often). In the current study, the reliability of family and friends social support and dietary behaviors surveys are 0.6 (after deleting 1 item) and 0.6 (after deleting 1 item), respectively. While the reliability of family and friends social support and PA surveys are 0.8.

- ***Self-monitoring:***

  Was measured by collecting screen shots taken by the participants of daily mDiet app reports, which represents their daily intake.

- ***Self-regulation:***

  Was measured by weekly checking of participants' progress and goals. The investigator posted in the Instagram story feature several times during the week to remind participants to continue entering their dietary intake in mDiet app.

- ***Self-efficacy:***

  - Weight self-efficacy questionnaire (Appendix 17): The questionnaire measures perceived control over food-related behaviors, and includes 20 different food-related situations such as (social events).[57] Reliability in the current study were as follow: $\alpha = 0.94$ at baseline; and $\alpha = 0.9$ post follow-up.
  - PA self-efficacy questionnaire (Appendix 18): It assesses student's confidence to be active when facing with 5 common barriers (e.g., bad weather

and lack of time).[58] Reliability in the current study were as follow: α= 0.9 at baseline; and α= 0.9 post follow-up.

**Distal Outcomes:** Were collected from all participants at baseline, post intervention, and follow-up.

- ***Anthropometrics:***

  All measurements included (height in cm, weight in kg, and waist circumference (WC) in cm, and BMI in $kg/m^2$) taken using standard techniques. Height was measured barefoot using a portable stadiometer to the closest 0.5 cm, weight was measured without heavy clothes by a digital scale to the nearest 0.1 kg, and WC was measured using the standard none stretchable tape taking the average of three readings.

- ***Fruit and Vegetable Intake:***

  Fruit and vegetable intake was evaluated with a Food Frequency Questionnaire (Appendix 19). Items related to fruits and vegetables were only used, which showed good reliability α= 0.8 at baseline in the current study.

- ***Physical Activity:***

  It was measured using the Godin Leisure-Time Exercise Questionnaire (GLTEQ), which evaluates the number of days and the average minutes per day over a period of 7 days that a participant engaged in strenuous, moderate, or mild PA (Appendix 20).[60] This validated survey is applicable for measuring leisure time activity in a community setting and has been utilized in numerous studies.[61-63]. Reliability in the current study α= 0.6 at baseline.

**Follow-Up (at week 10):**

All students received a link by email to complete the follow-up questionnaire and were asked to self-report their BW and WC. Students who came for post intervention measurements were given a measuring tape to self-measure their WC.

## Statistical Analysis

**Primary outcome is change in BW**

The primary aim of this study was to determine the effect of Instagram and mDiet on improving BW, fruit and vegetable intake and PA. BMI was not used because this is a 6-week trial and reductions in BMI are not expected to be significant. Moreover, only one of the reviewed studies in the literature reported changes in BMI because most of the studies were of short duration.

### Power

Based on a previous study used social media among college students, a reduction of -1.7 kg ±1.6 was considered statistically significant at a 4-week intervention.[4] After utilizing the G-Power program, the study needed a minimum sample size of 38 students (19 per arm). However, the current study enrolled 100 students (50 per arm) to account for 40% drop out rates at 6-weeks and additional 10% drop out rates at 10-week follow up.

**Missing Data:**

In the current study, subjects who had completed data at post and follow-up were used in the analysis. The goal of the current study design was to determine the efficacy of

the intervention treatment. Using intent-to-treat practices may not have provided much information about the effects of the program since participants who did not receive treatment would have been included in the analysis. To further examine participant dropout rates, a comparison between completers and non-completers will be conducted to examine differences in baseline characteristics.

**Statistical Analysis (Table 6)**

Subjects who had complete data at post and follow-up were utilized in the analysis. Data were described by means and standard deviations for continuous variables and percent for categorical variables. Demographic information that contained multiple categories such as marital status was dichotomized and the chi-square test of independence was used to assess differences between groups at baseline. A repeated-measures analysis of variance was used to assess changes over time among the continuous variables. Correlation Matrix was used to examine the correlation between multiple social media platforms and the main outcome. A *P*-value of 0.05 was used to indicate statistically significant differences.

Table 6.

*Statistical Analysis*

**AIM: To develop and examine the feasibility of a weight-loss intervention delivered by SM (Instagram) and the additive benefit of mobile self-monitoring app (mDiet) among female college students.**

| Hypothesis | Independent and Dependent Variables | Outcomes | Statistical Analyses |
|---|---|---|---|
| **H1:** The intervention group will report higher nutrition knowledge, family and friend social support for eating and exercise, self-efficacy for eating and self-efficacy for exercise than the control group post intervention. | Independent: Introducing Instagram and mDiet<br><br>Dependent: Nutrition knowledge, family and friend social support for eating and exercise, self-efficacy for eating and self-efficacy | Increasing nutrition knowledge, family and friend social support for eating and exercise, self-efficacy for eating and self-efficacy | Primary analysis: Repeated measures ANOVA. |
| **H2:** A combination of the SM "Instagram" and the self-monitoring app "mDiet" will significantly increase fruits and vegetables intake among SA female college students. | Independent: Introducing Instagram and mDiet<br><br>Dependent: Fruits and vegetables intake | Increasing fruits and vegetables intake compared with control group | Primary analysis: Repeated measures ANOVA. |
| **H3:** A combination of the SM "Instagram" and the self-monitoring app "mDiet" will significantly increase PA among SA female college students. | Independent: Introducing Instagram and mDiet<br><br>Dependent: PA score | Increasing physical activity compared with control group | Primary analysis: Repeated measures ANOVA. |
| **H4:** A combination of the SM "Instagram" and the self-monitoring app "mDiet" will significantly prevent weight gain among SA female college students. | Independent: Introducing Instagram and mDiet<br><br>Dependent: BW | Gaining fewer weights compared with control group | Primary analysis: Repeated measures ANOVA. |

# CHAPTER IV

# RESULTS

The purpose of this study was to develop and examine the feasibility of an obesity-prevention program delivered by SM (Instagram) and a mobile self-monitoring app (mDiet) among female college students as well as the effect of these apps on various outcomes including physical activity, fruits and vegetables intake, and body weight. The first section includes characteristics of the study sample. The second section includes the results of the six research hypotheses.

## Study Sample Characteristics

Participants provided demographic information through self-report. Their demographic information is provided in Table 7. Hundred students (~97%) were between the ages of 18-24 years old and 95 (~92%) had never been married, 7 (~7%) were married, and 1(1%) was separated. With regard to total number of children, only 3 (~3%) participants reported having one child and the rest (n= 100, ~97%) reported having no children. Participants were mainly studying science (n= 73, ~63%) and the majority were in level 4 (n= 42, ~41%). Moreover, 34 (~34%) of students had a GPA 3.5-3.99/5. Lastly, about half of the participants had normal BMI (about 47%).

Table 7.

*General Characteristics of the Subjects*

| | | N= 103 | % |
|---|---|---|---|
| **Age** | 18-24 | 100 | 97.1 |
| | 25-34 | 3 | 2.9 |
| **Marital Status** | Single | 95 | 92.2 |
| | Married | 7 | 6.8 |
| | Separated | 1 | 1.0 |
| **#of children** | No children | 100 | 97.1 |
| | 1 | 3 | 2.9 |
| **Major** | Business Administration | 12 | 11.7 |
| | Nursing | 5 | 4.9 |
| | Community | 1 | 1.0 |
| | Languages | 4 | 3.9 |
| | Sciences | 37 | 35.9 |
| | Social Services | 18 | 17.5 |
| | Arts | 5 | 4.9 |
| | Computer and Information Sciences | 14 | 13.6 |
| | Art and Design | 4 | 3.9 |
| | Education | 3 | 2.9 |
| **University Level** | Level 1 | 6 | 5.8 |
| | Level 2 | 18 | 17.5 |
| | Level 3 | 7 | 6.8 |
| | Level 4 | 42 | 40.8 |
| | Level 5 | 4 | 3.9 |
| | Level 6 | 8 | 7.8 |
| | Level 7 | 6 | 5.8 |
| | Level 8 | 12 | 11.7 |
| ***GPA** | 5 | 2 | 2.0 |
| | 4.75-4.99 | 13 | 12.9 |
| | 4.5-4.74 | 17 | 16.8 |
| | 4.0-4.49 | 22 | 21.8 |
| | 3.5-3.99 | 34 | 33.7 |
| | 3.0-3.49 | 11 | 10.9 |
| | Lower | 2 | 2.0 |
| **BMI** | Underweight | 13 | 12.6 |
| | Normal Weight | 49 | 47.6 |
| | Overweight | 25 | 24.3 |
| | Obese | 16 | 15.5 |

*N= 101

Table 8.

*Related characteristics of the Students at Baseline*

| | N | Mean±SD |
|---|---|---|
| **Modified Nutrition Knowledge** | 83 | 16.5±6.1 |
| **Social Support & Eating: Family** | 50 | 24.2±6.9 |
| **Social Support & Eating: Friends** | 49 | 25.7±6.4 |
| **Social Support & Exercise: Family** | 31 | 30.2±9.6 |
| **Social Support & Exercise: Friends** | 19 | 34.9±9.9 |
| **Self-Efficacy: Eating Habits** | 41 | 72.0±20.2 |
| **Self-Efficacy: Exercise** | 79 | 42.3±19.1 |
| **Fruits and Vegetables** | 83 | 2.7±2.1 |
| **Only Fruits** | 83 | 1.8±2.2 |
| **Only Vegetables** | 84 | .9±1.0 |
| **Physical Activity** | 90 | 35.2±23.9 |

In Table 8, the mean nutrition knowledge was 16.5±6.1. The mean of the family and friends social support and eating habits score was 42.2±6.9 and 25.7±6.4, respectively. While the mean of the family and friends social support and exercise score was 30.2±9.6 and 34.9±SD: 9.9, respectively. Students' self-efficacy with eating habits mean was 70.0±20.2, while their self-efficacy with exercise mean was 42.3±19.1. In terms of the main outcomes, students consumed an average of 2.7 servings of fruits and vegetables per day. They reported consumption an average of 1.8±2.23 fruits and .94±1.03 vegetables per day. Moreover, according to GLTE Questionnaire, a scale of 24 units or more is considered active, 14-23 units is considered moderate active, and less than 14 units is considered insufficiently active/sedentary. In the current study, the mean PA level was 35.20±23.86. This means that 67% of the students were getting the

recommended amount of physical activity/week. Students' weekly activity scores are shown in Table 9.

Table 9.

*Students' Weekly Leisure Activity Score*

| | GLTE Score | N | % |
|---|---|---|---|
| **Insufficiently Active/Sedentary** | <14 | 22 | 22.4 |
| **Moderately Active** | 14-23 | 12 | 11.7 |
| **Active** | >24 | 69 | 67.0 |

Table 10.

*Descriptive Table by Group at Baseline "Mechanisms of Actions"*

| | Intervention Group | | Control Group | | F | Sig. |
|---|---|---|---|---|---|---|
| | N | Mean±SD | N | Mean±SD | | |
| **Modified Nutrition Knowledge** | 44 | 15.36±6.97 | 39 | 18.15±4.56 | 4.53 | .08 |
| **Social Support & Eating: Family** | 20 | 27.00±8.09 | 27 | 28.89±6.64 | .77 | .38 |
| **Social Support & Eating: Friends** | 24 | 25.50±7.09 | 25 | 25.92±5.70 | .05 | .82 |
| **Social Support & Exercise: Family** | 19 | 28.63±8.42 | 12 | 32.58±11.06 | 1.27 | .27 |
| **Social Support & Exercise: Friends** | 14 | 37.21±10.33 | 5 | 28.40±4.72 | 3.29 | .09 |
| **Self-Efficacy: Eating Habits** | 20 | 73.70±18.82 | 21 | 70.42±21.76 | .26 | .61 |
| **Self-Efficacy: Exercise** | 40 | 46.65±20.34 | 92 | 37.92±18.87 | 3.90 | .05 |

As shown in Table 10, no significant differences between the intervention and the control groups were found at baseline in terms of nutrition knowledge, eating and

exercise social support that students received from family and friends, eating habits and exercise self-efficacy, and fruits and vegetables intake.

Table 11.

*Descriptive Table by Group at Baseline "Distal Outcomes"*

| | Intervention Group | | Control Group | | F | Sig. |
|---|---|---|---|---|---|---|
| | N | Mean±SD | N | Mean±SD | | |
| **Fruits and Vegetables** | 42 | 2.99±3.44 | 41 | 2.45±2.47 | 0.68 | .41 |
| **Only Fruits** | 42 | 2.1±2.5 | 41 | 1.48±1.89 | 1.44 | .23 |
| **Only Vegetables** | 42 | 0.92±1.16 | 42 | 0.95±0.89 | 0.02 | .89 |
| **Physical Activity** | 46 | 9.98±5.01 | 44 | 10.09±4.71 | 0.01 | .91 |
| **Height** | 55 | 157.02±5.88 | 48 | 156.91±6.86 | .01 | .93 |
| **Body Weight** | 55 | 58.49±14.14 | 48 | 60.74±15.38 | .59 | .45 |
| **BMI** | 55 | 23.63±5.23 | 48 | 24.60±5.50 | .83 | .37 |
| **Waist Circumference** | 55 | 71.90±10.42 | 48 | 70.44±10.70 | .49 | .49 |

Table 11 represents the differences between the two groups at baseline in terms of the main study outcomes. It shows that there is no differences between the groups in fruits and vegetable consumption, physical activity level, and anthropometric measurements.

The current study also looked at the daily usage of phone and social media among college students at baseline (Table 12). About 20% used their phone more than 6 hours per day. Among the platforms, Snapchat seems to be the most frequently used by college students (~70%), followed by Whatsapp (61.2%) and Instagram (55.3%). A high

percentage (26.2%) reported that they use social networks all day and about (50%) check their social network accounts in the evening.

Table 12:

*Social Networks Usage*

| Characteristics | N | % |
|---|---|---|
| **Phone Usage per Day** | | |
| < 1 hour | 1 | 1 |
| 1-2 hours | 5 | 4.9 |
| 3-4 hours | 18 | 17.5 |
| 4-6 hours | 25 | 24.3 |
| > 6 hours | 20 | 19.4 |
| All day | 33 | 32 |
| **Social Network Used** | | |
| Instagram | 57 | 55.3 |
| Snapchat | 72 | 69.9 |
| Twitter | 37 | 35.9 |
| Facebook | 0 | 0 |
| Pintrest | 3 | 2.9 |
| Whatsapp | 63 | 61.2 |
| Path | 8 | 7.8 |
| Swarm | 1 | 1 |
| **Number of hours of social networks per Day** | | |
| Not at all | 0 | 0 |
| Not every day | 2 | 1.9 |
| < 1 hour | 3 | 2.9 |
| 1-2 hours | 21 | 20.4 |
| 3-4 hours | 20 | 19.4 |
| 4-6 hours | 18 | 17.5 |
| > 6 hours | 11 | 10.7 |
| All day | 27 | 26.2 |
| Do not have access to check daily | 0 | |
| **How often you Create "post" on Social Networks** | | |
| Several times a day | 16 | 15.5 |
| Once a day | 12 | 11.7 |
| A few times a week | 25 | 24.3 |
| Once a week | 12 | 11.7 |
| A few times a month | 15 | 14.6 |
| Once a month | 9 | 8.7 |
| A few times a year | 7 | 6.8 |
| Never | 6 | 5.8 |
| **Most Likely Use Social Networks** | | |
| Right when you wake up | 24 | 23.3 |
| Morning | 24 | 23.3 |
| Afternoon | 26 | 25.2 |
| Evening | 51 | 49.5 |

| | | | |
|---|---|---|---|
| | Right before bed | 27 | 26.2 |
| | All day long | 22 | 21.4 |
| | N= 103 | | |

**Retention:**

Seventy-two (31%) out of a hundred three of randomized students completed the post intervention questionnaire. In examining demographic factors as predictors for noncompletion of the study at 6 weeks, there was no significant effect of any demographic factors including age, marital status, number of children, university level, and GPA (Table 13).

Table 13:

*Completers VS Non-Completers in Demographics*

| | | **Completers** | | **Non-Completers** | | **Chi-Square** | |
|---|---|---|---|---|---|---|---|
| | | N | % | N | % | **Value** | Asymp. Sig. (2-sided) |
| **Age** | 18-24 | 69 | 95.8 | 31 | 100 | | |
| | 25-34 | 3 | 4.2 | 0 | 0 | .25 | .55 |
| **Marital Status** | Single | 67 | 93.1 | 28 | 90.3 | | |
| | Married | 5 | 6.9 | 2 | 6.5 | 2.35 | .31 |
| | Separated | 0 | 0 | 1 | 3.2 | | |
| **#of children** | No children | 70 | 97.2 | 30 | 96.8 | .02 | 1.0 |
| | 1 | 2 | 2.8 | 1 | 3.2 | | |
| **University Level** | Level 1 | 5 | 6.9 | 1 | 3.2 | | |
| | Level 2 | 12 | 16.7 | 6 | 19.4 | | |
| | Level 3 | 4 | 5.6 | 3 | 9.7 | | |
| | Level 4 | 26 | 36.1 | 16 | 51.6 | 5.79 | .57 |
| | Level 5 | 4 | 5.6 | 0 | 0 | | |
| | Level 6 | 6 | 8.3 | 2 | 6.5 | | |
| | Level 7 | 5 | 6.9 | 1 | 3.2 | | |
| | Level 8 | 10 | 13.9 | 2 | 6.5 | | |
| **GPA** | 5 | 2 | 2.8 | 0 | 0 | | |
| | 4.75-4.99 | 6 | 8.3 | 7 | 24.1 | 8.26 | .22 |
| | 4.5-4.74 | 15 | 20.8 | 2 | 6.9 | | |

| | | | | |
|---|---|---|---|---|
| 4.0-4.49 | 17 | 23.6 | 5 | 17.2 |
| 3.5-3.99 | 23 | 31.9 | 11 | 37.9 |
| 3.0-3.49 | 8 | 11.1 | 3 | 10.3 |
| Lower | 1 | 1.4 | 1 | 3.4 |

In addition, there were no significant differences found between completers and non-completers for SCT mediators. However, in examining changes in the mediators the non-completers disproportionately scored less in nutrition knowledge, had lower family and friend social support for eating, lower family but not friend social support and exercise, and lower self-efficacy with eating habits but not with exercise scores (Table 14). Moreover, when examining distal outcomes, no significant differences between the completers and non-completers were found. However, the non-completers were less likely to consume fruits and vegetables and had lower body weight. Yet, non-completers had a higher physical activity score (Table 15).

Table 14:

*Completers VS Non-Completers in Changes in Mediators based on SCT*

| | **Completers** | | **Non-Completers** | | **F** | **Sig.** |
|---|---|---|---|---|---|---|
| | **N** | **Mean±SD** | **N** | **Mean±SD** | | |
| **Modified Nutrition Knowledge** | 59 | 17.08±5.65 | 24 | 14.92±6.86 | 2.21 | .14 |
| **Social Support & Eating: Family** | 31 | 29.32±7.29 | 16 | 25.69±6.83 | 2.74 | .11 |
| **Social Support & Eating: Friends** | 33 | 26.45±6.88 | 16 | 24.19±4.96 | 1.38 | .25 |
| **Social Support & Exercise: Family** | 32 | 39.16±20.46 | 12 | 34.67±11.48 | .51 | .48 |
| **Self-Efficacy: Eating Habits** | 31 | 72.71±19.12 | 10 | 69.90±24.22 | .14 | .71 |
| **Self-Efficacy: Exercise** | 56 | 41.11±18.18 | 23 | 45.35±24.04 | .73 | .40 |

Table 15:

*Completers VS Non-Completers in Changes in Outcomes*

| | Completers | | Non-Completers | | F | Sig. |
|---|---|---|---|---|---|---|
| | **N** | **Mean±SD** | **N** | **Mean±SD** | | |
| **Fruits and Vegetables** | 57 | 2.89±3.17 | 26 | 2.37±2.60 | 0.54 | .47 |
| **Only Fruits** | 57 | 1.82±2.36 | 26 | 1.69±1.94 | .07 | .79 |
| **Only Vegetables** | 58 | 1.05±1.10 | 26 | 0.68±0.79 | 2.33 | .13 |
| **Physical Activity** | 72 | 34.49±21. 10 | 31 | 36.87±63 | .22 | .64 |
| **Body Weight** | 72 | 60.59±15.20 | 31 | 57.09±13.72 | 1.21 | .27 |

## Research Specific Aims

### Aim 1: Examine the role of SM on college students eating behaviors.

In order to examine the role of social media on students' eating behaviors, the investigator created 16 questions. Based on modification indices from the reliability measures, three non-correlated items were excluded from the analysis. The reliability of the resulting 15 items was $\alpha$=0.6. Of the full sample of college females, 36% of the participants reported that they liked food advertisements on social media. More than 45% spent their money on food that they watched on SM. About 40% indicated they were interested in viewing unhealthy foods more than healthy foods. More than 47% reported that watching food on social media increases their hunger. Interestingly, 41.1% reported that they only follow those who are posting healthy foods. Moreover, 35.2% reported that they only watched food posts on social media. Table 16 characterizes the students' social media behaviors.

Table 16.

*Students' Social Media Behaviors*

| | Strongly agree | | Agree | | Does not apply | | Disagree | | Strongly disagree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| **My parents agree about any food I purchase after any food advertisement** | 4 | 4.4 | 17 | 18.9 | 25 | 27.8 | 32 | 35.6 | 12 | 13.3 |
| **I am not interested in watching unhealthy food on social media** | 17 | 18.9 | 30 | 33.3 | 14 | 15.6 | 22 | 24.4 | 7 | 7.8 |
| **I am interested in watching unhealthy food more than healthy food** | 21 | 23.3 | 21 | 23.2 | 10 | 11.1 | 35 | 38.9 | 3 | 3.3 |
| **Watching the celebrities on social media pushes me to reduce my body weight** | 23 | 25.6 | 36 | 40.0 | 18 | 20 | 12 | 13.3 | 1 | 1.1 |
| **Watching food on social media increases my hunger** | 25 | 27.8 | 43 | 47.8 | 8 | 8.9 | 5 | 5.6 | 9 | 10 |
| | **Rarely** | | **Sometimes** | | **Often** | | **Most of the time** | | **Always** | |
| | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| **I immediately go purchasing food after food advertisement** | 25 | 27.8 | 27 | 30.0 | 9 | 10.0 | 1 | 1.1 | 28 | 31.1 |
| **I feel that I really want to purchase the food that I just watched on social media** | 25 | 30.9 | 19 | 23.5 | 14 | 17.3 | 9 | 11.1 | 14 | 17.3 |
| **I ignore any unhealthy post** | 23 | 26.4 | 6 | 6.9 | 10 | 11.5 | 24 | 27.6 | 24 | 27.6 |

A correlation matrix was utilized to examine the relationships between social media participation and target health behaviors and BMI at baseline. Among the social media platform, Instagram was the only one correlated to BMI. However, none of the social media platforms were correlated to fruits and vegetables intake or physical activity at baseline. Table 17 presents all of the correlations.

Table 17:

*Correlation Matrix, Means, and Standard Deviations of Major Study Variable*

| Variables | BMI | Instagram | Snapchat | Twitter | Facebook | Pintrest | Whatsapp | Path | Swarm | Other | ASM | F&V | Fruit | Veg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BMI** | 1 | | | | | | | | | | | | | |
| **Instagram** | .309** | 1 | | | | | | | | | | | | |
| **Snapchat** | -.077 | -.010 | 1 | | | | | | | | | | | |
| **Twitter** | -.155 | -.110 | .039 | 1 | | | | | | | | | | |
| **Facebook** | [b] | [b] | [b] | [b] | 1 | | | | | | | | | |
| **Pintrest** | .055 | .155 | -.015 | -.011 | [b] | 1 | | | | | | | | |
| **Whatsapp** | .115 | .032 | .289** | .090 | [b] | -.102 | 1 | | | | | | | |
| **Path** | -.007 | -.108 | .028 | .007 | [b] | -.051 | .079 | 1 | | | | | | |
| **Swarm** | -.034 | .088 | .064 | .32 | [b] | -.017 | .078 | -.029 | 1 | | | | | |
| **Others** | .207* | -.105 | -.077 | .094 | [b] | .138 | -.216** | .149 | -.033 | 1 | | | | |
| **SM** | .034 | .128 | -.011 | .212 | [b] | .118 | .139 | -.164 | -.001 | .010 | 1 | | | |
| **F&V** | .174 | .101 | -.147 | -.022 | [b] | .069 | .061 | -.012 | -.026 | -.001 | -.038 | 1 | | |
| **Veg.** | .115 | .117 | -.142 | -.065 | [b] | -.036 | 1 | -.032 | .075 | .005 | -.082 | -.083 | .821** | 1 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

b. Cannot be computed because at least one of the variables is constant

**Aim 2: Examine the implementation feasibility and promise of a SM+Tracking intervention to change college students obesogenic health behaviors (fruit and vegetable intake & PA).**

## Feasibility Studies and Research Hypotheses

**Feasibility 1:**

Feasibility of the research design was demonstrated by baseline recruitment of 100 students, assuming 60% retention (with complete data) at post-test and 50% retention (with complete data) at follow-up.

A total of 135 students expressed interest in participating in the study. However, only 103 completed the baseline assessment. Of the 103 participants, 55 were randomized to the intervention group (6 weeks) and 48 to the control group. Retention at post intervention supported the Feasibility 1, with 71 of 103 (~60%) participants completing the post intervention assessment. However, the second part of the feasibility study was not supported, with only 28 of 103 (27%) participants completing the 4-week follow-up (post intervention) assessment (Figure 2).

**Feasibility 2:**

Feasibility of the intervention will be demonstrated by the number of likes, comments, and share in Instagram and strong satisfaction with intervention goals, content and format.

**1- Engagement:**

Level of engagement was examined for the Instagram group by quantifying the number of times participants "liked" a study-related post.

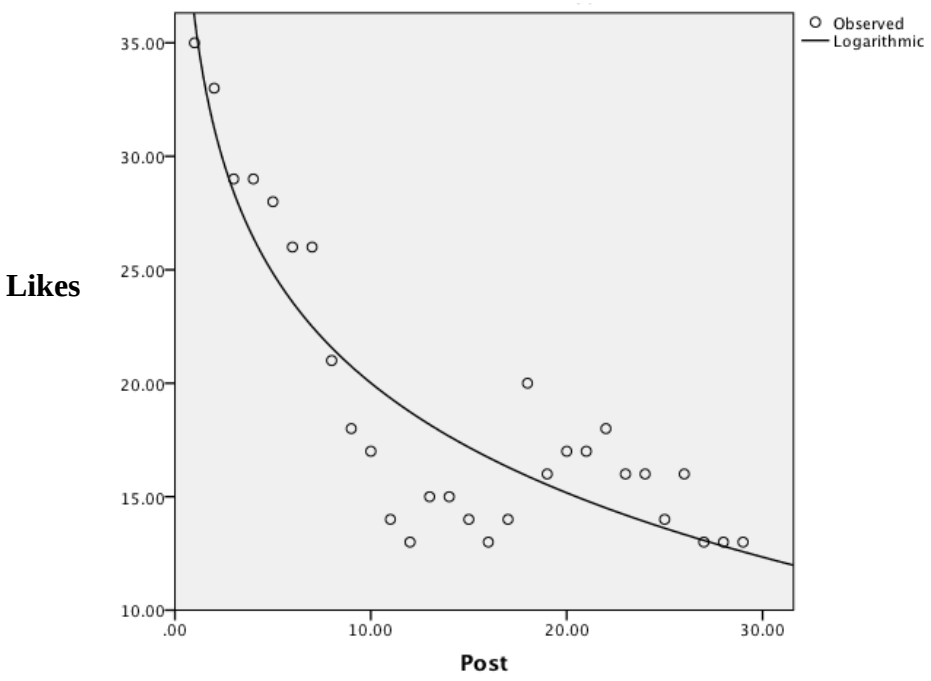
***Instagram***

**Participant Use:**

Of the 55 participants in the intervention group, 53 subjects participated by liking, or commenting on study-related Instagram posts resulting in 26 comments to the Instagram group. Only 5 students (9.1%) shared study-related Instagram posts while, 8 students (14.5%) participated in the study challenges. Intervention activity (likes, comments, shares and challenges) participation was high at the beginning and declined over time (Range= 13-35, mean= 24) (Figure 3).

Figure 3.

*The Participants' Activity during the Study Period*



## 2- Acceptability/Satisfaction:

Table 18.

*Satisfaction Items*

| Item | Disagree | | Neutral | | Somewhat agree | | Agree | |
|---|---|---|---|---|---|---|---|---|
| | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| **Did the daily food log help you think about your portions?** | | | | | 27 | 65.9 | 14 | 34.1 |
| **I will continue using the self-tracking app or any similar app** | 24 | 58.5 | 4 | 9.8 | 1 | 2.4 | 12 | 29.3 |
| **Instagram pictures/videos motivated me to consume fruits and vegetables** | | | | | | | 39 | 100 |
| **Instagram topics motivated me to consume fruits and vegetables** | | | | | | | 41 | 100 |
| **In general, Instagram posts were interested and helpful** | | | | | | | 41 | 100 |
| **I will participate in a similar study in future** | | | | | | | 40 | 38.8 |
| **I will encourage my friends and relatives to participate in similar research** | | | | | | | 40 | 100 |
| **I will continue applying what I've learned** | | | | | | | 40 | 100 |
| **In general, the study was easy** | | | | | | | 41 | 100 |
| **Using multiple apps in the study were annoying** | | | 13 | 31.7 | 26 | 63.4 | 2 | 4.9 |

A 10-item acceptability/satisfaction questionnaire was developed by the investigator for the purpose of the study. This questionnaire was provided to the intervention group (41 students) post intervention. Among Instagram participants who completed satisfaction measures (n=41), 100% found the Instagram topics interesting and motivating, 100% reported the intervention was interesting and helpful, 95% found that the Instagram pictures and videos motivated them to increase their consumption of fruits and vegetables, and 80% would encourage their friends and relatives to participate in similar intervention.

Related to the mDiet self-tracking app, only 34% thought that daily food log helped them think about portion sizes. Only 29% reported they would continue using the self-tracking app. About 63% reported that using multiple apps was annoying, while only ~4% found it not annoying. Additional items are presented in Table 18.

For hypotheses 1-4, repeated measures ANOVA was utilized. This analysis technique is used to assess in one dependent measured several times. The changes in the mediators and outcome variables between pre and post intervention were examined and presented in Table 19 and Table 20, respectively. Moreover, the changes in outcome variables between post and follow-up were tested (Table 21).

**Hypothesis 1:**

There will be a difference between the control and the intervention group in terms of change mediators based on SCT. The intervention group will report higher nutrition knowledge, family and friend social support for eating and exercise, self-efficacy for eating and self-efficacy for exercise than the control group post intervention.

## Mediators

### *Nutrition Knowledge:*

The intervention group demonstrated significantly higher knowledge than the control group post intervention, Wilks' Lambda= .6, F(1,45)= .30.1, p< .05 (Table 19).

### *Family and Friends Social Support and*

### *Eating Habits:*

The intervention group demonstrated significantly higher family support with eating habits post intervention, Wilks' Lambda= .9, F(1,30)= 4.8, p< .05 (Table 17). However, the change with friends social support and exercise was not statistically significant between intervention and control groups, Wilks' Lambda= .9, F(1,17)= ,12, p> .05 (Table 19).

### *Exercise:*

The intervention group demonstrated significantly higher family support with exercise post intervention, Wilks' Lambda= .9, F(1,30)= 4.8, p< .05 (Table 19). However, the change with friends social support and exercise was not statistically significant between intervention and control groups, Wilks' Lambda= .9, F(1,17)= ,12, p> .05 (Table 19).

### Eating Habits and Exercise Self-Efficacy

The change in eating behaviors self-efficacy scores from pre-test to post-test was significantly higher in the intervention than the control group, Wilks' Lambda= .9, F(1,53)= 4.9, p< .05 (Table 19). Additionally, the intervention group demonstrated

significantly higher exercise self-efficacy than the control group post intervention, Wilks' Lambda= .8, $F(1,54)= 11.8$, $p< .05$ (Table 19).

**Hypothesis 2:** There will be a difference between the control and the intervention group in fruits and vegetables consumption. The intervention group will report higher fruits and vegetables intake than the control group post intervention and increase or stay the same at follow up.

Descriptive statistics for changes in fruits and vegetables intake for groups pre, post, and follow-up are presented in Table 20 and Table 21, respectively. Table 20 shows that the change in fruits and vegetables intake scores from pre-test to post-test was not significantly different between intervention and control groups, Wilks' Lambda= .9, $F(1,55)= 1.2$, $p> .05$. There was however, a small interaction effect found between the two groups where the intervention increased fruit and vegetable intake while the control group decreased their fruit and vegetable intake as a result of the intervention (d=.35). Furthermore, when testing the changes in fruits intake separately for groups pre, post there is a significant difference between intervention and control groups, Wilks' Lambda= .67, $F(1,55)= 62.8$, $p< .05$. Table 21 shows that the change from post-test to follow-up was not significantly different between intervention and control groups, Wilks' Lambda= .96, $F(1,55)= 1.0$, $p> .05$.

**Hypothesis 3:** There will be a difference between the control and the intervention group in terms of physical activity. The intervention group will report physical activity level higher than the control group.

Descriptive statistics for the physical activity for the two groups pre and post test are presented in Table 20 and post-test to follow-up in Table 21. The change in physical activity scores from pre-test to post-test was not significantly different between intervention and control groups, Wilks' Lambda= .96, $F(1,70)= 2.25$, $p> .05$ (Table 20). The intervention group experienced a moderate within group effect (d= .03), however no between group effect was found. A similar result was found in the post and follow-up test, no significant difference between the groups was found Wilks' Lambda= .99, $F(1,26)= .38$, $p> .05$, yet there was a significant difference within the groups. The intervention group experienced increased in physical activity in the post and follow-up test (d= .02) (Table 21).

**Hypothesis 4:** There will be a difference between the control and the intervention group in terms of body weight. The intervention group will experience reduction in body weight, while the control group will gain weight.

The main aim of the current study is preventing weight gain among female college students. Descriptive statistics for changes in BW for the two groups pre and post test are presenting in Table 20 and post-test to follow-up in Table 21. At 6 weeks, weight changes were -.97kg for Instagram group and +.55kg for control group. Theses changes were not statistically significant between the groups, Wilks' Lambda= .99, $F(1,70)= .39$, $p> .05$ (Table 20). At 4 weeks follow up, weight changes were -.71kg for Instagram group and +.44kg for control group. Theses changes were not statistically significant between the groups, Wilks' Lambda= .99, $F(1,26)= .26$, $p> .05$ (Table 21).

Table 19.

*Repeated Measure ANOVA and Effect Sizes for Study Mediators*

| | Intervention | | | Control | | | Comparison | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **N** | **Mean±SD** | **Within Group Effect (Cohen's *d*)** | **Mean±SD** | **N** | **Within Group Effect (Cohen's *d*)** | **Wilks' Lambda** | **F** | **P-value** | **Between Group Effect (Hedges *d*)** |
| **Nutrition Knowledge** | | | | | | | | | | |
| **Pre** | 29 | 16.34±6.61 | 1.18 | 17.00±5.20 | 18 | .60 | .599 | 30.10 | <0.001* | .61 |
| **Post** | 29 | 23.03±4.57 | | 19.94±4.65 | 18 | | | | | |
| **Social Support for Eating - Family** | | | | | | | | | | |
| **Pre** | 15 | 24.53±7.27 | 0.34 | 26.65±6.10 | 17 | .18 | .863 | 4.75 | .037* | .17 |
| **Post** | | 26.60±4.60 | | 27.60±4.60 | | | | | | |
| **Social Support for Eating - Friends** | | | | | | | | | | |
| **Pre** | 11 | 26.00±7.20 | .23 | 30.00±4.08 | 4 | -1.06 | .992 | .102 | .755 | .25 |
| **Post** | | 27.82±8.48 | | 26.00±3.46 | | | | | | |
| **Social Support for Physical Activity - Family** | | | | | | | | | | |
| **Pre** | 24 | 38.92±20.65 | .31 | 39.88±21.26 | 8 | 0 | 0.82 | 6.82 | .014* | .29 |
| **Post** | 24 | 44.96±17.97 | | 39.88±20.63 | 8 | | | | | |
| **Social Support for Physical Activity - Friends** | | | | | | | | | | |
| **Pre** | 14 | 37.21±10.33 | .29 | 28.40±4.72 | 5 | 0 | .881 | 2.29 | .149 | .31 |
| **Post** | 5 | 40.14±9.55 | | 28.40±4.72 | | | | | | |
| **Self-Efficacy for Eating Habits** | | | | | | | | | | |
| **Pre** | 15 | 69.93±20.27 | 1.52 | 75.31±18.25 | 16 | .03 | .854 | 4.94 | .034* | .26 |
| **Post** | | 75.60±15.98 | | 75.50±18.27 | | | | | | |
| **Self-Efficacy for Physical Activity** | | | | | | | | | | |
| **Pre** | 28 | 44.54±19.02 | .39 | 37.68±16.95 | 28 | .03 | .821 | 11.80 | .001* | .42 |
| **Post** | | 51.64±17.63 | | 37.21±15.38 | | | | | | |

*P<0.01

Table 20.

*Repeated Measure ANOVA and Effect Sizes for Study Outcomes (Pre – Post)*

| | Intervention | | | Control | | | Comparison | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **N** | **Mean±SD** | **Within Group Effect (Cohen's *d*)** | **N** | **Mean±SD** | **Within Group Effect (Cohen's *d*)** | **Wilks' Lambda** | **F** | **P-value** | **Between Group Effect (Hedges *d*)** |
| **Fruit Intake** | | | | | | | | | | |
| **Pre** | 29 | 2.24±2.79 | .14 | 28 | 1.39±1.76 | .02 | .67 | 26.88 | 0.10 | .15 |
| **Post** | | 2.64±2.82 | | | 1.43±1.75 | | | | | |
| **Vegetable Intake** | | | | | | | | | | |
| **Pre** | 29 | 1.09±1.29 | .21 | 29 | 1.02±0.91 | -.64 | .98 | 1.23 | .09 | .65 |
| **Post** | | 1.36±1.20 | | | 0.56±0.45 | | | | | |
| **Fruit and Vegetable Intake** | | | | | | | | | | |
| **Pre** | 29 | 3.33±3.84 | .18 | 28 | 2.43±2.26 | -.21 | .98 | 1.24 | .271 | .35 |
| **Post** | | 4.00±3.78 | | | 2.00±1.85 | | | | | |
| **Physical activity** | | | | | | | | | | |
| **Pre** | 41 | 35.3±21.7 | 0.30 | 30 | 33.5±20.9 | .17 | .9 | 2.3 | .50 | .03 |
| **Post** | | 41.8±21.0 | | | 30.0±19.5 | | | | | |
| **Body Weight** | | | | | | | | | | |
| **Pre** | 41 | 58.28±15.67 | -.06 | 31 | 63.64±14.22 | .04 | .99 | .39 | .54 | .10 |
| **Post** | | 57.31±15.36 | | | 64.19±14.34 | | | | | |

Table 21.

*Repeated Measure ANOVA and Effect Sizes for Study Outcomes (Post – Follow-up)*

| | Intervention | | | Control | | | Comparison | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **N** | **Mean±SD** | **Within Group Effect (Cohen's *d*)** | **N** | **Mean±SD** | **Within Group Effect (Cohen's *d*)** | **Wilks' Lambda** | **F** | **P-value** | **Between Group Effect (Hedges *d*)** |
| **Fruit Intake** | | | | | | | | | | |
| **Post** | 12 | 2.22±1.76 | .09 | 12 | 1.05±1.15 | .07 | .98 | .44 | .52 | .27 |
| **FU** | | 2.39±2.15 | | | 1.28±1.60 | | | | | |
| **Vegetable Intake** | | | | | | | | | | |
| **Post** | 14 | 0.84±0.95 | .03 | 13 | 0.56±0.38 | .59 | .90 | 2.69 | .11 | .56 |
| **FU** | | 0.81±0.82 | | | 0.94±0.82 | | | | | |
| **Fruit and Vegetable Intake** | | | | | | | | | | |
| **Post** | 12 | 3.11±2.66 | .03 | 12 | 1.63±1.31 | .36 | .96 | 1.00 | .33 | .25 |
| **FU** | | 3.18±2.56 | | | 2.23±1.96 | | | | | |
| **Physical activity** | | | | | | | | | | |
| **Post** | 13 | 43.77±24.04 | .10 | 13 | 31.00±24.34 | .17 | .99 | .38 | .55 | .02 |
| **FU** | | 40.69±35.51 | | | 27.38±18.39 | | | | | |
| **Body Weight** | | | | | | | | | | |
| **Post** | 15 | 56.14±12.96 | 1.07 | 13 | 61.18±14.51 | .03 | .99 | .26 | .62 | .08 |
| **FU** | | 55.43±12.53 | | | 61.62±14.76 | | | | | |

## Summary

The final section of this chapter will provide a summary of the results of the analysis of the hypotheses and research aims for this study. A p-value <0.05 was used to make decisions about accepting and rejecting the null hypotheses. Table 22 summarizes theses analysis and related decisions as well as the significance levels for the hypotheses tested.

Table 22

*Summary of Findings for Hypotheses*

| **Promise Summary** | | |
|---|---|---|
| **Hypothesis 1:** | **Findings** | **Decision** |
| *There will be a difference between the control and the intervention group in terms of change mediators based on SCT.* | | |
| **Nutrition Knowledge** | P= <0.001 | Fail to Reject |
| **Social Support** | | |
| - *Eating Habits & Family Support* | P= .037* | Fail to Reject |
| - *Eating Habits & Friends Support* | P= .755 | Reject |
| - *Exercise & Family Support* | P= .014* | Fail to Reject |
| - *Exercise & Friends Support* | P= .149 | Reject |
| **Self-Efficacy** | | |
| - *Eating Habits* | P= .034* | Fail to Reject |
| - *Exercise* | P= .0018 | Fail to Reject |

| **Hypothesis 2:** | **Findings** | **Decision** |
|---|---|---|
| *A combination of SM and self-monitoring app will significantly increase fruits and vegetables intake among Saudi Arabian female college students.* | | |
| Pre-Post Test: | P= .271 | Reject |
| Post-Follow up Test: | P= .33 | Reject |
| **Hypothesis 3:** | **Findings** | **Decision** |
| *A combination of SM and self-monitoring app will significantly increase physical activity among Saudi Arabian female college students.* | | |
| Pre-Post Test: | P= .50 | Reject |
| Post-Follow up Test: | P= .55 | Reject |
| **Hypothesis 4:** | **Findings** | **Decision** |
| *A combination of SM and self-monitoring app will significantly prevent weight gain among Saudi Arabian female college students.* | | |
| Pre-Post Test: | P= .54 | Reject |
| Post-Follow up Test: | P= .62 | Reject |

*P<0.05

# CHAPTER V

# DISCUSSION

The purpose of the current study was to develop and examine the feasibility of an obesity-prevention program delivered by SM (Instagram) and a mobile self-monitoring app (mDiet) among female college students as well as the effect of the utilization of these apps on various outcomes including physical activity, fruits and vegetables intake, and body weight. Three aims were identified: First, to determine the effectiveness of the intervention components on SCT constructs including, nutrition knowledge, social support, and self-efficacy. Second, to determine the effect of using social media along with self-tracing app on increasing fruits and vegetables intake. Third, to examine the impact of using social media along with self-tracing app on increasing physical activity. Last, determine the effect of using social media along with self-tracing app on preventing weight gain among college students. Lastly, future directions are drawn.

## Summary of the Study

The intervention was based on social cognitive theory, which has been previously used to improve diet and physical activity behaviors and resulted in a substantial BW reduction. The current study aimed to increase 5 main SCT constructs including awareness, social support, self-monitoring, and self-regulation. Increasing those constructs would predict increases in individual's self-efficacy. Our findings suggest that increasing self-efficacy led to improvements in fruits and vegetables intake and physical activity, therefore, preventing weight control.

Students were recruited from Princess Nourah bint Abdulrahman University, Riyadh, KSA. To be eligible for the current study they had to meet the eligibility criteria and complete the online survey. The total sample consisted of 103 students. They were randomly assigned to an intervention group (55) or a control group (48).

Participants in both groups were asked to complete the online questionnaire before randomization. This questionnaire consisted of basic demographic questions, health indicator items, social network usage, and several scales that included nutrition knowledge, which was modified based on the intervention topics; physical activity, to measure activity level; family and friends support, to measure their effective role on eating and exercise behaviors; eating habits confidence scale, to measure individual's self-efficacy; exercise confidence scale, to measure individual's self-efficacy.

Based on social cognitive theory, two feasibility studies of the research design and four hypotheses were developed to learn more about the effect of social media and self-tracking app, and how they can change lifestyle behaviors and, therefore, reduce body weight. The feasibility studies were used to assess the feasibility of the intervention design by retention and individual's satisfaction. The research hypotheses predicted several outcomes. First, The intervention program, which based on SCT, would increase nutrition awareness, social support, self-monitoring, self-regulation, and self-efficacy, which therefore might change lifestyle behaviors. Second, students in the intervention group would report higher intake of fruits and vegetables than students in the control group. Third, students in the intervention group were predicted to increase their physical activity score compared with their peers in the control group. Lastly, students in the

intervention group were expected to reduce their body weight compared with students in the control group.

The results of this study provided support for the assumptions of the first feasibility study, indicating that 60% of students completed post intervention. The second feasibility study demonstrated that the participants in the intervention were effectively engaged by providing a number of likes, comments, and share in Instagram and by indicating strong satisfaction with intervention goals, content and format". The three outcome hypotheses were not supported; however, changes in mediators suggest promising results for future interventions.

The study suffered from 31% drop-out rate at post intervention. Dropout rate is a major difficulty in weight gain prevention studies and can potentially bias the results.[72] Common drop-out rates in Web-based interventions for weight loss are greater than 20%.[73] The current study's drop-out rate is slightly higher than in these studies. However, in this study, dropout was not equal between the two groups. At post intervention, the dropout rate in the intervention group was ~21%, while the dropout rate in the control groups was ~39%. This unequal dropout rates between the groups is likely to be intervention-related. The control group did not receive any treatments in the current study. This might lead to loss of interest to continue participating in the study.

When comparing completers with noncompleters there were no significant differences in demographics, SCT mediators or outcomes. However, the noncompleters in the current study reported slightly less in nutrition knowledge scores, family and friend social support and eating, family but not friend social support an exercise, self-efficacy

with eating habits and exercise scores (Table 14). The non-completers were also more likely to eat less fruits and vegetables, to exercise, and had lower body weight (Table 15). Literature has shown mixed results with regard to drop-out and initial body weight and a review of the behavioral approach to weight reduction reports that both a higher and lower initial BMI have been linked to drop-out in weight reduction studies.[74]

## Discussion of the Hypotheses

The feasibility 1 study of the research design demonstrated that baseline recruitment of 100 students, assuming 60% retention (with complete data) at post-test and 50% retention (with complete data) at follow-up was partially possible. About 60% students completed the post intervention assessment. These results are supported by previous literature, which indicated that 30% drop-out rate happened at post intervention. However, the drop-out rate was high at follow up. This is further discussed in the feasibility design.

The Feasibility 2 study on the potential for the intervention to engage participants demonstrated that participants engaged by providing a number of likes, comments, and share in Instagram and strong satisfaction with intervention goals, content and format. The results show that 100% of the students in the intervention group found the intervention helpful and interesting. A hundred percent reported that they would encourage their friends to participate in such a program in the future. This confirmed a previous study that tested the social media Facebook to deliver a weight loss program to college students.[19] About 97% of the participants found the program helpful and 100% of them would recommend the program to others.

**Hypothesis 1:** There will be a difference between the control and the intervention group in terms of change mediators based on SCT. The intervention group will report higher nutrition knowledge, family and friend social support for eating and exercise, self-efficacy for eating and self-efficacy for exercise than the control group post intervention.

Social cognitive theory was manipulated in the current study in the development of the intervention component. The 5 constructs that were used were nutrition awareness/knowledge, social support, self-monitoring, and self-regulation. These 4 constructs were used to emphasize self-efficacy, which therefore would lead to behavioral changes.

At pre and post intervention, the intervention group significantly increased nutrition knowledge ($p < .05$), family social support and eating habits ($p < .05$) and exercise habits ($p < .05$), but not family and friends support with either eating habits or with physical activity ($p > .05$). Moreover, the intervention group was significantly increased eating habits and exercise self-efficacy ($P < .05$). Therefore, the hypothesis#1 was supported, except friends social support scale.

**Hypothesis 2:** There will be a difference between the control and the intervention group in terms of fruits and vegetables consumption. The intervention group will report higher fruits and vegetables intake than the control group post intervention and increase or stay the same at follow up.

Although a self-tracking app previously increased fruits and vegetables intake among college students in 7 weeks,[40] in the current study mDiet app was not effective enough to produce significant results. Fruits and vegetables intake increased in the

intervention group, but was not statistically significant. Dietary intakes were self-reported and the researchers did not validate food intake. This could lead to under and/or overestimation of the intake of fruits and vegetables.

**Hypothesis 3:** There will be a difference between the control and the intervention group in terms of physical activity. The intervention group will report physical activity level higher than the control group.

Along with a previous study that examined the efficacy of social media Facebook, in conjunction with physical activity and a self-monitoring website among the same subjects,[35] the current study did not find significant changes in physical activity between the two groups. The use of a self-report PA measure, small sample size, and short duration of the study could have affected the results.

**Hypothesis 4:** There will be a difference between the control and the intervention groups in body weight. The intervention group will experience reduction or maintenance in body weight, while the control group will gain weight.

In contrast to the Napolitano and colleagues study,[19] that was also conducted a study among college students, the current study could not detect a statistically significant change between the two study groups in body weight at post Wilks' Lambda= .99, $F(1,70)= .39$, $p> .05$ (Table 20) and follow-up Wilks' Lambda= .99, $F(1,26)= .26$, $p> .05$ (Table 21) assessment. Napolitano et al.[19] used Facebook in conjunction with access to healthy activities. At 4 and 8 weeks, the Facebook plus group experienced the greatest weight loss at ~-1.7 kg and ~-2.5 kg, respectively and the changes in BW among the groups were statistically significant. In the current study, participants in the intervention

group lost ~-1 kg and ~-.7 kg at 6 and 10 weeks, respectively. Consistent with our findings, a Twitter study found that this social media was also not effective in reducing BW.[40] After 6 months, the researchers observed minimal weight changes in both groups (~0.25 kg) without a difference between the groups. This gives some evidence that delivering weight-related health behavior content vie social media platform in addition to a self-tracking app may not be enough to drive body weight loss in particular. In contrast with the Twitter research, the goal of our current study was to prevent weight gain, which was more realistic for the length of time of our study's follow-up.

## Discussion of Study Design

### Discussion of Methodology

To our knowledge, this randomized controlled trial study is the first to demonstrate the feasibility of using Instagram to deliver a program to prevent weight gain in college students in Saudi Arabia. The data indicated that a combination of social media and self-tracking app prevent weight gain. Moreover, such method produced significantly improvement in nutrition knowledge, social family social support, and eating and exercised self-efficacy post-intervention. No changes were found for study outcome behaviors such as fruit and vegetable intake or physical activity. This type of intervention delivery, mobile-based, can be affordably and easily delivered to a large number of individuals.

The current study aims to prevent weight gain among female college students by using social and self-tracking app to educate, motivate, and change behaviors that support weight reduction and healthy weight control. Students in the current study did not show a

significant body weight reduction; this might be because the time of year when the study was conducted may have affected the outcomes. During the first 6 weeks, the students had their midterms, while the 10-week follow up occurred over the summer break and month of Ramadan a time when dietary behaviors change considerably. Findings from this study will add to the growing research literature on how technology and social networks can be used to increase PA and fruit and vegetable intake, two behaviors important for body weight control. Additionally, this study may yield further insights into the relationships between social media use, social support, and health behaviors. Social media has been shown to be a promising venue for health promotion given its ubiquity and that users can share their experiences in real-time.[64,65] Though social media platform has been shown to improve self-esteem[64-68] and life satisfaction[68,69] there is limited evidence regarding its benefit on health behaviors,[35] in particular from prospective studies.

Self-monitoring of dietary intake regardless of the methods, have been shown to be effective in changing lifestyle behaviors. [19,36,36,38] The current study used one of the current self-monitoring apps widely available to the Arabic population. The study used mDiet in particular because it is the only app found in Arabic. All students (100%) in the intervention group reported that using self-tracking app helped them think about food portion sizes.

Social support has been show to be a key component in behavioral weight-reduction programs.[75] The current study used Instagram as a method to deliver the nutrition and physical activity intervention and allow students to support each other during their lifestyle changes efforts. The study investigators posted 1-2 posts per day and

encouraged the student to interact and posted students post to motivate the others to do the changes. Surprisingly, participants in the Instagram group in the current study reported significant nutrition and physical activity social support that they received from their family but not from their friends.

Results provided support for feasibility and acceptability regarding the use of delivering a nutrition and physical activity intervention to college students. Specifically, everyone (100%) in the Instagram group found the study interested and helpful, 100% reported that the Instagram topics motivated them to consume fruits and vegetables, and 100% would encourage their friends and family to participate in such a program.

**Limitations**

Though this study has a number of strengths, there are several limitations that should be addressed as they may affect the generalizability and interpretation of these results. First, this study had a relatively small sample size (N= 103), although the effects were large enough to detect significant differences among the groups. Drop-out rates were high at the 10-week follow-up. This is probably because of the summer and Ramadan month had started. Due to the probability that students leaving town for summer vacation along with Ramadan beginning, this may have influenced student diet and physical activity habits as many participate in fasting from sunrise to sundown during this time. In regard to the instrumentation used in the study, there have been some limitations. Students in the control group might have had friends in the control group. Therefore, they might have been cross-contamination that exposed controls to some of the intervention.

Moreover, all of the information was self-reported, except anthropometrics at baseline and post intervention. Self-reported data have numerous advantages including its practicality, cost-effectiveness and ease of administration.[70] Yet, there are several limitations to self- reported data, such as participants' ability to accurately recall past events, response bias, and social desirability.[71] Accordingly, perceived actions may be different than actual behaviors.

The study has some strengths. First, it was fully online. Students in both groups were asked to complete the survey online. They were able to complete the survey anytime and open it several time to finish it. Second, this was a randomized control trial with comparable participants in both the intervention and control groups. Third, this kind of intervention is a cost-effective treatment for weight related behaviors and could be beneficial in reducing obesity epidemic. Nowadays, there are many weight loss apps and they are free or reasonable price and can provide a very cost effective way to encourage adherence to a weight reduction plan. Additionally, compare to face-to-face method, technology-based interventions may have a greater potential to reach large numbers of individuals and make a public health influence. Lastly, this study had a strong theoretical design, which may have contributed to the results seen in the mediators.

**Future Directions:**

The current study provided promising results in changing mediators of health behaviors in college students. Longer studies with higher sample sizes are needed to determine efficacy in changing health behaviors. Researchers need to determine strategies to deal with long-term engagement with these platforms. Future research is

needed to determine the level of continued engagement and utilization of the platforms, as well as sustainability of weight control or weight loss. However, from a public health standpoint, even preventing weight gain or achieving small to modest weight loss due to knowledge that is disseminated on broad scale could have a positive effect on population health.

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**APPENDICES**

Appendix 1.

*Recruitment Flyer "English"*

# CHALLENGE YOUR HEALTH IN 42 DAYS!

The purpose of this project is to prevent weight gain among Saudi Arabian female college students by helping students improve their dietary behaviors and increase physical activity.

Participation in this project will require you to:

1. Attend 3 in-person sessions (15 minutes each)
2. Participants in the intervention group only:
    a. Follow and participate in a social media based intervention using ***Instagram***
        i. You will be asked to log on to ***Instagram*** through your mobile device at least once daily to read study related messages posted, "like," "share," and/or "comment."
    b. Utilize the self-monitoring application ***mDiet*** daily.

This project will allow you to increase your own nutrition and physical activity knowledge, motivation and health messaging. You may also gain insights about sharing and exchanging content through social-networking sites.

*Recruitment Flyer "English"*

# تحدي الصحة في ٤٢ يوما !

الغرض من هذه الدراسة هو منع زيادة الوزن لدى طالبات الجامعة في **المملكة العربية السعودية** **عن طريق تحسين السلوك الغذائي و زيادة الحركة.**

المشاركة في البحث تتطلب منك التالي:

١ـ حضور 3 جلسات (لمدة ١٥ دقيقة)

٢ـ المشاركات في مجموعة استخدام الهاتف المحمول فقط:

**أ.** المتابعة والمشاركة في حساب الدراسة على تطبيق الانستقرام "Instagram".

**ـ ـ** سيتطلب منك تسجيل الدخول من خلال هاتفك المحمول مرة واحدة على الأقل يوميا لقراءة الرسائل المنشورة والمشاركة بالنشر أو كتابة تعليق.

**ب.** استخدام تطبيق مراقبة الوزن "mDiet" بشكل يومي.

هذه الدراسة ستزيد من معلوماتك الغذائية وتساعدك في زيادة نشاطك البدني.

في حالة الالتزام بمتطلبات الدراسة ستحصلين على ساعة تقوم بتسجيل النشاط اليومي المبذول من خطوات و سعرات حرارية تتيح لك **pedometer**

**Participants will receive free fitbit as part of this study!**

Appendix 2.

*Consent Form "English"*

FIU | FLORIDA INTERNATIONAL UNIVERSITY

**ADULT CONSENT TO PARTICIPATE IN A RESEARCH STUDY**

A mobile-based intervention for obesity prevention among female college students in Saudi Arabia: A randomized controlled trial

**PURPOSE OF THE STUDY**

You are being asked to be in a research study that will be conducted at Princess Nourah bint Abdulrahman University in Riyadh. The purpose of this study is to develop and examine the feasibility of an obesity-prevention program delivered by social media and a mobile self-monitoring application.

**NUMBER OF STUDY PARTICIPANTS**

If you decide to be in this study, you will be one of 100 students in this research study.

**DURATION OF THE STUDY**

Your participation will require less than 5 minutes per day for 12 weeks, ~45 minutes at baseline, and 15 minutes at 6 week and 12 week.

**PROCEDURES**

If you agree to be in the study, we will ask you to do the following things:

1. Complete an online screening form to determine eligibility via Qualtrics.
2. Attend 3 in-person sessions
    a. Orientation session (~45 minutes)- at baseline
        i. Learn more about the project
        ii. Review informed consent
        iii. Receive a link for an online survey (30-45 minutes)
        iv. Anthropometric measurements such as height, weight, and waist circumference will be collected
    b. Intervention completion (~15 minutes)- at week 6
        i. Receive a link for an online survey (30-45 minutes)
        ii. Anthropometric measurements such as height, weight and waist circumference will be collected
    c. Program completion (~ 15 minutes)- at week12
        i. Receive a link for an online survey (30-45 minutes)

ii. Anthropometric measurements such as height, weight and waist circumference will be collected

3. Participants in the intervention group only:
    a. Follow and participate in a social media based intervention using Instagram
        i. You will be asked to log on through your mobile device at least once daily to read messages posted, "like," "share," and/or "comment."
    b. Utilize the self-monitoring application mDiet daily.

**RISKS AND/OR DISCOMFORTS**

Potential discomfort may be experienced by subjects due to required use of a public-accessed social networking site, Instagram. Risks compared to anticipated benefits are negligible. Subjects' potential benefits out-weight the risks. Knowledge related to the outcomes of this study could potentially provide insight into the feasibility of the use of social networking sites as platforms for health-behavior interventions.

**BENEFITS**

The following benefits may be associated with your participation in this study:

1. This project will allow you to increase your own nutrition and physical activity knowledge, motivation and health messaging.
2. You may also gain insights about sharing and exchanging content through social-networking sites.
3. The prevalence of obesity in Saudi Arabia can be reduced in a cost-effective method.

**ALTERNATIVES**

There are no known alternatives available to you other than not taking part in this study. However, any significant new findings developed during the course of the research which may relate to your willingness to continue participation will be provided to you.

**CONFIDENTIALITY**

The records of this study will be kept private and will be protected to the fullest extent provided by law. In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be stored securely and only the researcher team will have access to the records. However, your records may be reviewed for audit purposes by authorized University or other agents who will be bound by the same provisions of confidentiality.

**COMPENSATION & COSTS**

You will receive a pedometer if you participate to the end of the study. If you are fully engaged in the study, there will be a random selection on a weekly basis to

receive a gift card. Each week there will be a winner. You will not be responsible for any costs to participate in this study.

**RIGHT TO DECLINE OR WITHDRAW**
Your participation in this study is voluntary. You are free to participate in the study or withdraw your consent at any time during the study. Your withdrawal or lack of participation will not affect any benefits to which you are otherwise entitled. The investigator reserves the right to remove you without your consent at such time that they feel it is in the best interest.

**RESEARCHER CONTACT INFORMATION**
If you have any questions about the purpose, procedures, or any other issues relating to this research study you may contact Abeer Alssafi at 0500205552, aalss001@fiu.edu or Catherine Coccia, Ph.D., R.D. at 3053480194, ccoccia@fiu.edu.

**IRB CONTACT INFORMATION**
If you would like to talk with someone about your rights of being a subject in this research study or about ethical issues with this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

**PARTICIPANT AGREEMENT**
I have read the information in this consent form and agree to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. I understand that I will be given a copy of this form for my records.

_____ _____
Signature of Participant Date

_____
Printed Name of Participant

_____ _____
Signature of Person Obtaining Consent Date

*Appendix 3.*

*Consent Form "Arabic"*


## موافقة على المشاركة في دراسة بحثية
## لدى طالبات الجامعات في السعودية استخدام الهاتف المحمول لمنع السمنة

**الهدف من الدراسة**

أنت مدعو للمشاركة في بحث علمي سيجرى في جامعة الأميرة نورة بنت عبدالرحمن في الرياض. الغرض من هذه الدراسة البحثية هو تطوير ودراسة جدوى لبرنامج الوقاية من السمنة عن طريق استخدام وسائل التواصل الاجتماعي وتطبيق مراقبة الوزن لدى طالبات الجامعة.

**عدد المشاركات في الدراسة**

إذا قررت أن تشاركي في هذه الدراسة ستكونين واحدة من 100 طالبة في هذه الدراسة البحثية.

**الفترة الزمنية للدراسة**

سوف يتطلب منك حضور جلسة تعريفية لمدة 45 دقيقة وجلستين في الأسبوعين السادس والثاني عشر مدتهما 15 دقيقة، أيضا سيتطلب منك المشاركة أقل من 5 دقائق لمدة 12 أسبوعا.

**إجراءات تطبيقية**

**في حاله الموافقه على المشاركه في هذه الدراسه سوف يطلب منك الاتي:**

**1-** إكمال استبيان مبدئي عبر الانترنت لتحديد الأهلية عبر تطبيق كواتركس "Qualtrics".

**2-** حضور 3 جلسات المذكورة أدناه:

**أ. في الاسبوع الأول:** جلسة تعريفية (لمدة 45 دقيقة) تتضمن الآتي:

- التعرف على المزيد حول الدراسة.
- مراجعة نموذج الموافقة في المشاركة في البحث.
- تلقي رابط عبر البريد الالكتروني لاستبيان واحد عبر الانترنت (لمدة 30 دقيقة).
- جمع قياسات الطول والوزن ومحيط الخصر.

**ب. في الأسبوع السادس:** جلسة الانتهاء من تطبيق الدراسة (لمدة 15 دقيقة) وتتضمن:

- تلقي رابط عبر البريد الالكتروني لإجراء استبيان واحد عبر الانترنت (لمدة 15 دقيقة).
- جمع قياسات الطول والوزن ومحيط الخصر.

**جـ. في الأسبوع الثاني عشر:** جلسة المتابعة (لمدة 15 دقيقة) وتتضمن:

- تلقي رابط عبر البريد الالكتروني لإجراء استبيان واحد عبر الانترنت (لمدة 15 دقيقة).
- جمع قياسات الطول والوزن ومحيط الخصر.

**3-** المشاركات في مجموعة استخدام الهاتف المحمول فقط:

**أ.** المتابعة والمشاركة في حساب الدراسة على تطبيق الانستقرام "Instagram".

**-** سيطلب منك تسجيل الدخول من خلال هاتفك المحمول مرة واحدة على الأقل يوميا لقراءة الرسائل المنشورة والمشاركة بالنشر أو كتابة تعليق.

**ب.** استخدام تطبيق مراقبة الوزن " بشكل يومي.

**الآثار الجانبية المتوقعة**

لا توجد آثار جانبية معروفة مرتبطة بإجراءات الدراسة. قد يكون هناك شعور بعدم الراحة المحتمل من قبل المشاركات بسبب المطالبة باستخدام حساب عام عبر موقع التواصل الاجتماعي "Instagram".

**الفوائد الناتجة عن الدراسة**

1- هذه الدراسة ستزيد من معلوماتك الغذائية وتساعدك في زيادة نشاطك البدني.

2- تقليل نسبة السمنة في السعودية بأقل تكلفة ممكنة.

**سياسة الخصوصية**

سيتم المحافظة في كافة الأوقات على خصوصية وسرية كافة البيانات الشخصية التي نحصل علهيا. ولن يتم إفشاء هذه المعلومات إلا إذا كان ذلك مطلوبا بموجب قانون الجامعات السعودية المعترف بها. ولن يتم نشر معلومات قد تجعل من الممكن التعرف عليك في حالة نشر نتائج الدراسة. سيتم تخزين البيانات الشخصية بشكل سري وآمن ولن يطلع عليها إلا فريق الدراسة. إلى جانب إمكانية استعراض بياناتك الشخصية لأغراض بحثية أخرى من قبل الجامعات المعترف بها من وزارة التعليم العالي السعودي

.

**التكاليف المادية والحوافز**

لن تكوني مسؤولة عن صرف أي مبالغ مادية للمشاركة في هذه الدراسة.

في حالة الالتزام بمتطلبات الدراسة إلى الأسبوع الثاني عشر ستحصلين على ساعة تقوم بتسجيل النشاط اليومي المبذول من . خطوات وسعرات حرارية تتيح لك متابعة نشاطك البدني بشكل مستمر fitbit

إضافة إلى ذلك سيكون هناك جوائز أسبوعية تحفيزية عبارة عن بطاقات مسبقة (Gift cards) والتي سيكون عليها سحب الدفع

عشوائي من مجموع المشاركات الملتزمات بالدراسة.

**الحق في الرفض أو الانسحاب**

مشاركتك في هذه الدراسة تطوعية وكل كامل الأحقية في الانسحاب في أي وقت أثناء الدراسة. إن انسحابك أو عدم مشاركتك لن يؤثر على نتائج الدراسة. ويحق لفريق للبحث استبعادك دون الحصول على موافقتك في الوقت الذي يشعر فيه أنه في مصلحة

**معلومات الاتصال بفريق البحث**

إذا كان لديك أي أسئلة حول الغرض من الدراسة أو الإجراءات المتخذة أو أية مواضيع أخرى تتعلق بهذه الدراسة يمكنك التواصل مع :

– عبير الصافي 05002055525 , aalss001@fiu.edu

– د كاثرين كوتشيا 3053480194 , ccoccia@fiu.edu

**معلومات الاتصال بلجنة الأخلاقيات والبحوث الطبية**

إذا كنت ترغبين بالتحدث مع شخص ما حول حقوقك كمشاركة في هذه الدراسة البحثية أو حول القضايا الأخلاقية مع هذه الدراسة، يمكنك الاتصال بجامعة فلوريدا العالمية لسلامة البحوث عن طريق الهاتف 3053482494 أو عن طريق البريد الالكتروني ori@fiu.edu

**الموافقة على المشاركة**

أقر أن الموقع أدناه بأنني قرأت كافة المعلومات في هذا النموذج وأوافق على المشاركة في هذه الدراسة، ولقد أتيحت لي الفرصة لطرح أي أسئلة تتعلق بالدراسة وقد تم الرد عليها، وسأستلم نسخة من هذا النموذج.

**اسم المشاركة:** _____ **التاريخ:**_____

**توقيع المشاركة:**_____

**توقيع الشخص الذي سيحصل على هذه الموافقة:**_____ **التاريخ:**_____

Appendix 4.

*IRB-Florida International University*

FIU | FLORIDA INTERNATIONAL UNIVERSITY

**Office of Research Integrity**
**Research Compliance, MARC 414**

Dr. Catherine Coccia

"A mobile-based intervention for obesity prevention among female college students in Saudi Arabia: A randomized controlled trial"

---

The Institutional Review Board of Florida International University has your study for the use of human subjects via the process. Your study was found to be in compliance with this institution's Federal Wide Assurance (00000060).

| | | |
|---|---|---|
| IRB-17-0359 | | 11/06/17 |
| 105842 | **IRB Expiration Date:** | 11/06/18 |

As a requirement of IRB Approval you are required to:

Submit an IRB Amendment Form for all proposed

**Receive annual review and re-approval of your study prior to your IRB expiration date**. Submit the IRB Renewal Form at least 30 days in advance of the study's expiration date. or discontinued.

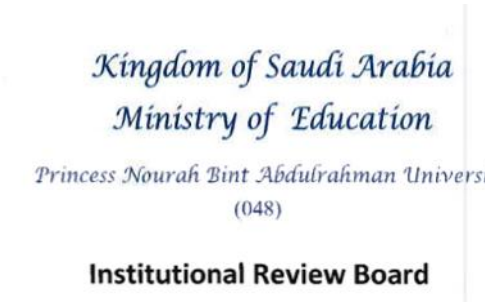
***Special Conditions:*** N/A.

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

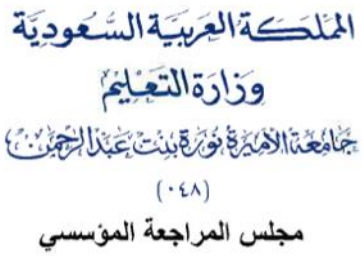
MMV/em

Appendix 5.

*IRB-Princess Nourah bint Abdulrahman University "English"*








**Date: 10/17/2017**

**Reference Number: 17-0120**

**Name of the study: A mobile-based intervention for obesity prevention among female college students in Saudi Arabia: A randomized controlled trial**

Type of IRB: Exempt

Dear researcher: Abeer Hussain Alssafi

Thank you for submitting your proposal to Princess Nourah bint Abdulrahman University (PNU) Institutional Review Board.
We would like to inform you that after reviewing your proposal and making sure that there is no known risks associated with the study procedures, provide you an exempt IRB. However, you still have to provide us the external IRB.

If there are further changes regarding the procedures, please inform PNU-IRB before start applying it. You will have to fill out an adjustment form when the changes happen.

Please inform the PNU-IRB if the study stops anytime during the study. Moreover, kindly inform the PNU-IRB if the study risks outweigh the benefits. If that happens, the PNU-IRB will ask you to provide details information and how will you deal with it.

Please provide PNU-IRB a report every 6 months. Additionally, please indicate the number above in every message related to the study. Please provide us with any manuscript before publishing it.

We wish you best of luck.
Please contact us for any further information

Regards,
Dr. Ibtesam Almadhi
Head of the IRB Department
Princess Nourah bint Abdulrahman University
Phone: +966 824 0861
Email: irb@pnu.edu.sa

Appendix 5.

*IRB-Princess Nourah bint Abdulrahman University "Arabic"*

Kingdom of Saudi Arabia
Ministry of Education
Princess Nourah Bint Abdulrahman University
(048)
**Institutional Review Board**

جامعة الأميرة نورة بنت عبد الرحمن
Princess Nourah bint Abdulrahman University

المملكة العربية السعودية
وزارة التعليم
جامعة الأميرة نورة بنت عبد الرحمن
(٠٤٨)
**مجلس المراجعة المؤسسي**

رقم تسجيل المجلس لدى مدينة الملك عبدالعزيز للعلوم و التقنية H-01-R-059

التاريخ : 17-10-2017م

رقم المعاملة : 17-0120

اسم البحث: ( استخدام الهاتف المحمول لمنع السمنة لدى طالبات الجامعات في السعودية عن طريق استخدام وسائل التواصل الاجتماعي)

تصنيف الموافقة : معفي

سعادة الباحثة عبير بنت حسن الصافي

نشكر لك تقديمكم خطتكم البحثية لمجلس المراجعة المؤسسي في جامعة الأميرة نورة بنت عبد الرحمن.

نفيدكم أن خطة بحثكم قد تمت مراجعتها والتأكد من مراعاتها للقوانين الوطنية التي تخص حماية العينات البشرية. وقد قرر مجلس المراجعة المؤسسي في جامعة الأميرة نورة بنت عبد الرحمن أن المخاطر المحتملة على المشاركين في البحث لا تتجاوز الحدود الدنيا، وبالتالي منح البحث تصنيف "معفى". يرجى ملاحظة أن هذه الموافقة تقتصر على الناحية الأخلاقية للبحث، ويتوجب عليكم الحصول على موافقة خاصة من رئيس القسم في جامعة الأميرة نورة بنت عبد الرحمن، أو من الجهات المعنية في أية مؤسسة خارجية قبل البدء بجمع البيانات.

نود التنويه بضرورة الالتزام بإجراء البحث وفق الخطة المقرة من مجلس المراجعة المؤسسي. وإذا طرأ أي تعديل على خطة البحث فلا بد من إعادة تقديمها للمجلس والحصول على موافقة على خطة البحث الجديدة قبل البدء بتطبيقها. يجب تقديم (نموذج طلب تعديل) للمقترح في حال إجراء أي تعديل على خطة البحث. ننوه أن بعض التغييرات في خطة البحث قد تمنع البحث من الحصول على تصنيف "معفى" مما يستدعي تقديم طلب مراجعة جديد أو تزويد المجلس بمعلومات أو وثائق إضافية.

يجب تنبيه مجلس المراجعة المؤسسي في حال إيقاف الدراسة، أو حدوث أي أمر طارئ أو وقوع أية أحداث سلبية قد تؤثر على الدراسة، كما ينبغي إبلاغ المجلس بأية معلومات جديدة تؤثر على نسبة الفائدة مقابل المخاطر في البحث. سيطلب المجلس عندها شرحاً وافياً للحالة، وكيفية تعاملكم معها.

كما نفيدكم أن الأنظمة تتطلب منكم تقديم تقرير عن سير عمل البحث كل ستة أشهر. يرجى الإشارة إلى رقم المعاملة المدون أعلى هذا الإشعار في جميع المراسلات المتعلقة بالبحث. ويلزم التقيد بتقديم مسودة لأي مقالة تنتج عن هذا البحث قبل تقديمها للنشر.

نتمنى لك التوفيق. ونرجو التواصل معنا إذا كان لديكم أي استفسار.

مع أطيب تحية وتقدير،

د. ابتسام الماضي
رئيس مجلس المراجعة المؤسسي
جامعة الأميرة نورة بنت عبدالرحمن
رقم الهاتف: 8240861 966+
البريد الالكتروني: irb@pnu.edu.sa

جامعة الأميرة نورة بنت عبدالرحمن
مجلس المراجعة المؤسسي
Institutional Review Board (IRB)
17 OCT 2017

Appendix 6.

*Fitbit*

Appendix 7.

*Logo "English"*

Appendix 8.

*Logo "Arabic"*

Appendix 9.

*Instagram Topics*

| Week | Sunday | Monday | Tuesday | Wednesday | Thursday |
|---|---|---|---|---|---|
| | General Nutrition | Physical Activity | Fruits & Vegetables | Social Support | Self Monitoring & Self Regulation |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |
| 6 |  |  |  |  |  |

## Topic 1 “General Nutrition”

***Week 1 (MyPlate):***

كيف يكون صحني [صحن صحي] ؟

،

الحصة الأكبر (نصف الصحن) للسلطة الخضراء..
*يمكن استبدالها بالخضار المطبوخة او الايدامات كالملوخية والرجلة والسبانخ وغيرها..

.

ربع الصحن فقط لمجموعة النشويات أو الكربوهيدرات مثل الرز، المكرونة، والخبز..
ينصح بطبخها بطريقه صحيه بعيدا عن الدهون او الزيوت والأضل استبدالها بالنشويات التي تحتوي على الحبوب الكاملة مثل الرز الأسمر أو الخبز البر أو النخالة..

.

.

الربع الأخير من الصحن يجب أن يحتوي على مجموعة البروتينات مثل الدجاج واللحوم والأسماك والأجبان قليلة الدسم والبيض..
*ينصح بطبخ اللحوم والدجاج والأسماك بطريق صحية كالشوي أو السلق.

.

حتى تكون وجبتي صحيه تماما ينصح بتناول حبه من الفاكهة أو نصف كوب من لطة الفواكه مع الجبة أو أكلها كجبة خفيفة بعد الوجبة الرئيسيّة.
ورونا إبداعاتكم في تقسيم وجبتكم الريسية وراح اشرها عشان الكل يستفيد !
#تحدي-الصحه-في-٤٢-يوما

#صحة #صحة_رشاقه_نقاط_قد_التحدي_لا_للحرمان #رشاقة #نحافة #تغذية #وزني #وزن #فواكة #خضروات #غداء #رياضة #سمنة #الرياض #جامعة_الاميرة_نورة #جامعة_الأميرة_نورة #جامة #طالبات #حمية#دايت #تحدي #صرار #عزيمة

***Week 2*** ***(Snack):***

معلومة:
تعرفون ان الوجبة الخفيفة/سناك المفروض تحتوي على أقل من ١٥٠ سعرة حرارية؟
،
،
في الصورة أمثلة لبعض الوجبات الخفيفة اللي ممكن تتناولوها خلال اليوم!
١ كوب سلطة: ٥ سعرات حرارية
حبة تفاحة متوسطة الحجم ٤٥ سعرة حرارية
حبة برتقال متوسطة الحجم: ٤٥ سعرة حرارية
٣ حبات تمر: ٣٥ سعرة حرارية
بيضة واحدة: ٦٥ سعرة حرارية
نص كوب زبادي قليل الدسم: ٧٠ سعرة حرارية
١ كوب بوب كورن من دون إضافات: ٣٠ سعرة حرارية
شريحة توست أسمر/بر: ٨٠ سعرة حرارية
عندكم إضافات ثانية لوجبات خفيفه صحيه؟

#شاركونا وجباتكم الخفيفة على هذا الهاشتاق

#تحدي-الصحه-في-٤٢-يوما

***Week 3 (White Rice VS Cauliflower Rice):***


اللي يبون ينحفون وينكم
اللي سمعت عن رز الزهرة المفرومة أو جربته من قبل ترفع يدها

رز الزهرة عبارة عن زهرة مفرومة تقدروا تاكلوا منها الكمية اللي تبغوها لأنها تعتبر من مجموعة #الخضروات
بهالطريقة تكونوا خففتوا من #النشويات أو #الكربوهيدرات وزودتوا من كمية الخضروات
؛
طريقة اعدادها:
١- قطعي الزهرة قطع صغيرة ثم غسليها جيدا
٢- ضعي الزهرة في الخلاط وافرميها حتى يصبح شكلها كحبات الرز
٣- اطبخي الزهرة المفرومة بالبخار لمدة ١٠ دقايق أو الى أن تصبح طرية

أكيد طعمها مو زي طعم الرز بس اللي حابة تنزل من وزنها هالطريقة بتساعدها كثير في نزول الوزن
؛
جربوها وشاركونا التجربه
#تحدي-الصحه-في-٤٢-يوما
،
#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة
#طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت
#حمية #حميه #حميه_غذائيه

***Week 4 (Fiber):***

تحدي هالأسبوع..!
أكيد كلكم سمعتوا عن الألياف الغذائية! بختبر معلوماتكم ! اللي تعطيني جواب كافي للأسئلة اللي بطرحها بتفوز بقسيمة الشراء المجانية بقيمة ٩٣ ريال من #الأمازون
؛
ماهي الألياف الغذائية؟
وماهو دورها؟
وماهي مصادرها؟
وكم نحتاج يوميا؟
؛
*في الصوره بعض من مصادر الألياف الغذائية - غششتكم بواحد من الأسئلة 
؛
اكتبوا أجوبتكم في اضافة "تعليق" واللي تعطيني الجواب الكافي لها الجائزة
#تحدي-الصحه-في-٤٢-يوما

؛
؛
؛
#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 5 (Protein Sources):***


مصادر البروتين النباتية

؛

لأن في طرق عديدة لزياده البروتين في غذاننا حبيت اشارككم ببعض الأطعمة اللي ممكن تزيدونها في يومكم عشان تزيدون من كمية البروتين..

؛

١ كوب فاصوليا: ٢٢٠ سعرة حرارية، ٠ جم دهون، ٤٠ جم كالسيوم، ١٢ جم ألياف، ١٤ جم بروتين.
١ كوب بازلاء: ١١٨ سعرة حرارية، ٠,١ جم دهون، ٢١ جم كالسيوم، ٧ جم ألياف، ٨ جم بروتين
١ كوب عدس: ٢٤٠ سعرة حرارية، ٠ جم دهون، ٤٠ جم كالسيوم، ١٦ جم ألياف، ١٨ جم بروتين.
١ كوب حمص: ٢٤٠ سعرة حرارية، ٢ جم دهون، ٤٤ جم كالسيوم، ١٢ جم ألياف، ١٢ جم بروتين.

#تحدي-الصحه-في-٤٢-يوما

***Week 6*** 

***(Challenge):***

ودخلنا الاسبوع الأخير و التحدي الأخير
اذا انتبهتوا كان كل يوم في الأسبوع مخصص لموضوع معين (٥ مواضيع من الأحد الى الخميس).
؛
[التحدي]: المطلوب منكم ترسوا لي يوميا عادة صحية سويتوها خلال اليوم + تجاوبوا على ال ٥ أسئلة اللي موجودة في هذا البوست (الأجوبة بتلاقوها في البوستات في هذا الحساب)! واللي ترسل أكثر تربح قسيمة الشراء المجانية بقيمة ٩٣ ريال من الأمازون
؛
في الفديو/البوست بتشوفون بعض العادات الصحية والصحيحة اللي تكلمنا عنها في الأسابيع الماضية برجع أذكركم ببعض منها:
[الأحد: معلومات عامة ]:
١: مم يتكون الصحن الصحي
٢: كم سعرة حرارية يجب أن لاتزيد عنها الوجبة الخفيفة مع ذكر مثال
[الاثنين: الرياضة]:
٣ و ٤: كم سعرة حرارية نحرق في صعود الدرج ورياضة نط الحبل
[الثلاثاء: الخضار والفواكة]:
٥: كم حصة من الفاكهة نحتاج يوميا
[الأربعاء: الدعم الاجتماعي ]:
قلنا ليش ما نستبدل خرجاتنا مع زميلاتنا أو أخواتنا من مقهى أو مطعم لأقرب ممشى
أيضا قلنا نتشارك في إعدد طبق صحي
[الخميس: مراقبة النفس]:
نصحنا بمراقبة الوزن وقياسه اسبوعيا بدلا من قياسه يوميا
كذلك حاولنا تذكيركم باستخدام تطبيق "عداد السعرات" وادخال كل ما تتناولوه خلال اليوم
؛

أجوبتكم في التعليقات في الاسفل عندكم ليوم الخميس تجاوبوا على الأجوبة + ترسلوا لي العادات الصحية اللي سويتوها خلال الأسبوع

#تحدي-الصحه-في-٤٢-يوما

**Topic 2 "Physical Activity"**

***Week 1 (Motivation):***

مالكم خلق تسوون رياضة أو ماعندكم وقت تسوون فيه أي نشاط رياضي؟!

كلنا تجينا هالفترة : (
أحسن حل ممكن يشجعنا نسوي رياضة اذا ماكان لنا خلق هو اننا نشتري جزمة رياضة أو/و ملابس رياضة جديدة

#تحدي-الصحه-في-٤٢-يوما

،
مين تبدأ أول وحدة وتشاركنا التجربة

ان كنت جربيتها قبل شاركينا التجربة

#صحه #تحدي #تغذية #نحافة#رشاقة #سمنة #بدانة #الرياض #جامعة_الأميرة_نورة #طالبات #بنات #دايت #حميه

***Week 2 (Stairs):***


مين تحرص على صعود الدرج بدل من استخدام المصعد أو السلم الكهربائي؟
:
عندكم علم بأن صعود الدرج لمدة ١٥ دقيقة يمكنك حرق تقريبا ١٤٠ سعرة حرارية وهي السعرات نفسها الموجودة في شريحة بيتزا صغيرة بالجبنة!!
ايش تنتظروا؟! استعملوا الدرج بدل من السلالم المتحّركة

خلونا نحرق سعرات بدل ما نحرق كهرباء..
#تحدي-الصحه-في-٤٢-يوما

#تحدي #صحة #لياقة #تغذية #دايت #ريجيم #رشاقة #نحافة #سمنة #بدانة #فواكة #خضروات #طالبات #طالبات_جامعة_الاميرة_نورة #سعرات #سعرات_حرارية #سعرات_حراريه

***Week 3 (Statistics):***


كم ساعة في اليوم تقريبا تقضوها على وسائل التواصل الاجتماعي ؟ أنا تقريبا ٤ ساعات #وانتوا

؛
فيه دراسة أُجريت في ٢٠١٦ تقول بأن طلبة الجامعات في السعودية يستخدموا الجوال بمعدل ٥ ساعات ونص في اليوم !
؛
؛
كلكم تعرفوا كيف الجلسة هذي ممكن تؤثر على الوزن !!
،
فكرة:
ايش رايكم لو نستغل الوقت هذا بدل من الجلوس على الكنبة ومشاهدة مواقع التواصل الاجتماعي بالحركة والاستمتاع بالمواقع ! نترك الجوال على شاشة الجهاز الرياضي ونتحرك في نفس الوقت بكذا نكون استغلينا وقتنا اللي كان ضايع ضايع

#تحدي-الصحه-في-٤٢-يوما

،
#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 4 (Jump Rope):***

مين تمارس رياضه الحبل ترفع يدها؟

،

ماعندكم جهاز رياضي في البيت؟ ماعندكم وقت تروحون للنادي الرياضي أو المواصلات صعبة عندكم؟ جربتوا تشترون الحبل الرياضي وتستخدمونه في البيت؟ الحبل قيمته تقريبا ١٥ ريال لكن نتائجه سريعة وحلوة!

،

،

تعرفوا ان فيه دقيقة وحدة يمكنكم حرق ١٠ سعرات حرارية؟ هذا يعني بامكانكم حرق ١٠٠ سعرة حرارية خلال ١٠ دقايق !! و٢٠٠ سعرة حرارية خلال ٢٠ دقيقة ! وهكذا ..

،

،

هذي وحده من الرياضات السريعة الحرق واللي عن طريقها تقدروا توصلوا للشكل المطلوب ! جربوها

#تحدي-الصحه-في-٤٢-يوما

،

؛

#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 5 (Walk):***

# خطـوة xxxx

تحدي هالأسبوع

لمين قسيمة الشراء المجانية بقيمة ٩٣ ريال من الأمازون هالمرة؟
؛
التحدي هو:
بنشوف عدد الخطوات كاملة خلال الأسبوع! اللي تجيب أكبر رقم خطوات لها الجائزة
بنبدأ العد من اليوم الى يوم الأحد القادم بحول الله..
؛
المطلوب منكم ترسلوا لي عدد الخطوات اللي يسجلها التطبيق في نهاية كل يوم..
١
٢
٣
انطلقوا..

#تحدي-الصحه-في-٤٢-يوما
؛
؛
#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 6 (Walking instead of using the metro):***

مين تفضل انها تمشي بدلا من استخدام المترو؟ ترفع يدها

،

أخر مره زرتكم قلت بجرب أشوف كم خطوة أحرق "بالمشي" من محطة لمحطة !

،

أحد عنده علم كم دقيقة مشي من محطة لمطة؟ وكم خطوة تقريبا ؟!

اللي محافظين على الرياضة واللي تستخدموا تطبيقات عداد الخطوات جاوبوا ..

،

أنا أنحسبت عندي في التطبيق ١٠ خطوات في أقل من دقيقة ..

هذى يعني بأن في أقل من ٥ دقائق نكون وصلنا للمحطة الخامسة !

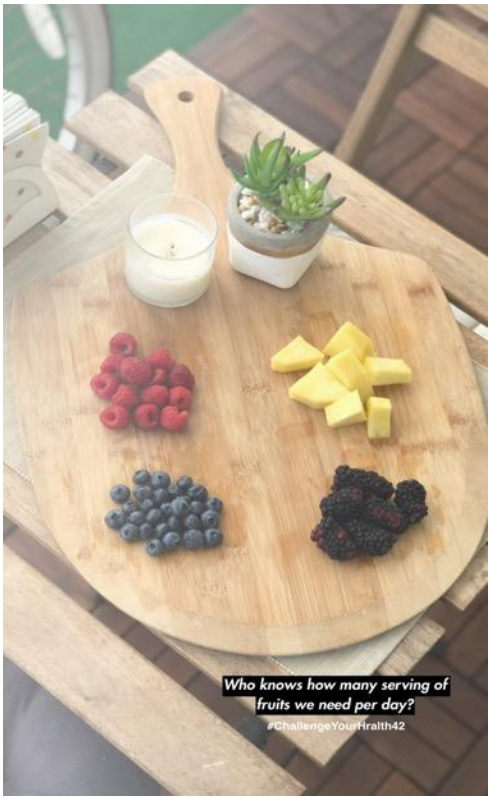
،

لسا بتاخذوا المترو؟ ولا بتشجعين زميلاتك إنكم تتنقلوا مشي بين المحطات؟

#تحدي-الصحه-في-٤٢-يوما

## Topic 3 “Fruits & Vegetables”

***Week 1 (Fruit / serving size):***




جواب السؤال اللي سألته اليوم..
كم حصه من الفواكة نحتاج يوميا..!
نحتاج ٣-٤ حصص من الفواكة يوميا..
كل مقدار من الفاكهة الموجودة في الصوره يساوي حصة واحدة..

معلومات تهمك
- أقل من ٣ (٢,٦) في المية من السعوديين ياكلون الكميه الموصى بها من منظمة الصحة العالمية!!
،

- قله أكل الخضروات والفواكة تزيد من نسبة الإصابة بالأمراض المزمنة كأمراض القلب والسكري والسمنة..
.
اذا قريتي المعلومة وتذكرتي انك لم تتناولي ولا حصة من الفواكة،، احرصي على تناول حصتين على الأقل قبل النوم

#تحدي-الصحه-في-٤٢-يوما

#صحّة #تحدي # تغذية # نحافة #رشاقة #سمنة #بدانة #الرياض #جامعة_الأميرة_نورة #طالبات #بنات #دايت #حمية

***Week 2 (Cooked Vegetables):***

ايش تناولتوا اليوم من مجموعة الخضروات؟
#سلطة_خضراء ؟ ولا #خضار_مطبوخة ؟ ولا ايدامات زي الملوخية والسبانخ؟ #شاركونا
؛

ايش رايكم بصحن الخضروات هذا؟
#جزر
#بروكلي
#زهرة/قرنبيط مشوية بالفرن مع شوية زيت زيتون
؛

الصوص عبارة عن:
زبادي قليل الدسم
ثوم مهروس
شبت مقصره صغير
شوي ليمون
ملح وفلفل

؛
سووهاوجربوها وشاركوها أهلكم في البيت وقولوا لنا حبيتوها أولا
#تحدي-الصحه-في-٤٢-يوما

***Week 3 (Fruit pizza Challenge):***


التحدي الثالث: تحدي بيتزا الفواكه

؛
شاركونا إبداعاتكم في صنع بيتزا من الفواكه  على هذا الهاشتاق
#تحدي-الصحه-في-٤٢-يوما

إبداعاتكم بعرضها هنا وبنسوي تصويت عليها
الصورة اللي تحصل على أعلى تصويت بتفوز بقسيمة الشراء المجانية من الأمازون بقيمة ٩٣ ريال

آخر يوم لاستقبال الصور هو يوم #الاثنين القادم..

#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 4 (Salad):***


جواب سؤال اليوم
كم نحتاج من الخضروات في اليوم؟
،
احتياجاتنا للخضروات في اليوم يعتمد على العمر والجنس ومستوى الأداء الرياضي..
،
نحتاج كبالغين تقريباً [كوبين ونصف] في اليوم وهو احتياجنا اليومي اذا كنا ممن يمارس النشاط الحركي المتوسط الجهد أقل من ٣٠ دقيقة في اليوم..
أما بالنسبة للأشخاص اللي يمارسون الرياضه قد يحتاجون أكثر مو كوبين ونصف في اليوم!
،
#سؤال: الحصة الواحد من السلطة الخضراء الطازجة تُعادل كم كوب؟
#تحدي-الصحه-في-٤٢-يوما
،
،
#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 5 (Fruit Juice):***

كيفكم مع الفواكه ؟
ماتحبون تاكلونها؟ طيب كيف العصيرات الطازجة معاكم؟
دخل الصيف ونحتاج مشروبات باردة .. خلونا بالعصيرات والكوكتيلات الطازجة وابتعدوا عن المعلبات والمشروبات الغازية
ايش نوع الفواكة أو العصيرات الطازجة اللي تفضلونها؟
؛
جربوا هالعصير البااارد الطازج أو استبدلوه بالفواكه التي تحبون وشاركوه مع من تحبون.
المقادير:
أناناس
توت أحمر
توت أسود
توت أزرق
ربع كوب مويه
؛
الطريقة:
١- تغسل الفواكة ويقطع الأناناس مكعبات صغيرة.
٢- تضاف الفواكه في الخلاط مع المويه.
٣- تخلط جميع المقادير مع بعض وتضع في الجك المخصص.
؛
[تذكري ]:
١- ابتعدي عن اضافة السكر واستبدليه بالموز .
٢- أكل الفواكة طازجة بدلا من شربها كـ عصير.
#تحدي-الصحه-في-٤٢-يوما
؛
#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 6:***

اللي أكلوا فاكهة اليوم يرفعوا يدهم ويشاركونا نوع الفاكهة ..
مشغولين مع واجبات واختبارات الجامعة وماعندكم وقت تاخذون احتياجكم اليومي من الفواكه؟!
جربوا صحن سموذي الفواكه السريع اللذيذ هذا بيساعدكم على التركيز أكثر
،
الفواكة لا تحتوي فقط على الكربوهيدرات اللي تم تمدنا بالطاقة بل هي غنية بالفيتامينات والمعادن الضروريه لوظائف المخ وبالتالي تساعدنا على التركيز!
،
المقادير:
أناناس
توت أزرق
توت أسود
نص حبة موزة
ربع كوب زبادي قليل الدسم
ربع كوب مويه
،
الطريقة:
توضع الفواكة بعد غسلها وتقطيعها في الخلاط مع الزبادي والمويه ثم توضع في صحن وتزين على طريقتك الخاصة ..
،
جربوها وشاركونا الفواكة المستخدمة
#تحدي-الصحه-في-٤٢-يوما

## Topic 4 “Social Support”

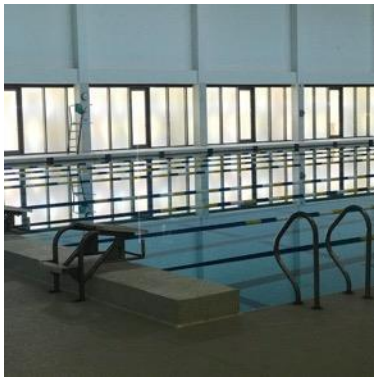
***Week 1 (Fruit Basket / Challenge):***

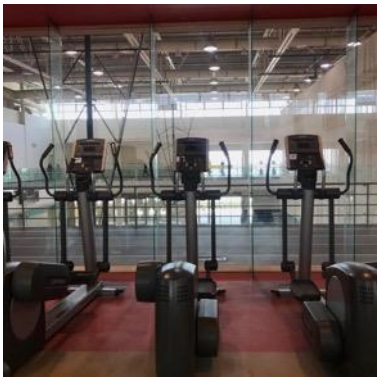
تحدي  هالأسبوع هو تحدّي #سلة_الفواكه
بطلب منكم تسوون سله فواكه وتحطوها في مكان واضح لجميع أفراد البيت..
اختاروا الفواكه اللي موجودة عندكم في البيت مو ضروري تشتروا بس أهم شئ تكون السلة شكلها مغري عشان تغري بقية أفرد البيت
ممكن تكون فاكهة وحده بس ترتيبها بشكل حلو داخل سله أو صندوق  وتحطوها في مكان يوصله الجميع!
ممكن تنشروا الصوره في حسابكم في #الانستقرام وتحطوا منشن للحساب أو تستخدموا الهاشتاق

#تحدي_الصحة_في_٤٢_يوما وبكذ ا تكونوا أفدتوا صديقاتكم ومعارفكم كمان!
أو ممكن ترسلوا لي الصوره على #دايركت_مسج
صوركم وإبداعاتكم كلها بعرضها في الستوري هنا وبنسوي تصويت على أجمل  #سلة_فواكه
؛
أخر يوم لاستلام الصور هو الثلثاء القادم !
يلا ورونا ابداعاتكم

***Week 2 (Gym):***





اللي مسجلة في نادي الجامعة أو قد سجلت قبل ترفع يدها ؟

أخذت جولة على النادي أمس ماشاء الله تبارك الله حبيبيت مره وسعر الاشتراك رمزي: ١٠٠ ريال في الشهر ؟ عندهم أغلب الرياضات ومضمار للمشي والجري ؟ هذي أمثلة للرياضات الموجودة:

ملعب كرة سلّة

مسبح كبير جداً

كلاسات سبينينق

كلاسات للتمارين الرياضية

رياضة التسلّق

وغيرها الكثيير..

حبيت فكرة الفرق اللي مسوينها  حلو تروحين انت وصديقاتك وتتنافسون على شي حلو

#تاق أو #منشن لصديقتك اللي تبين تروحين للنادي معاها

#تحدّي_الصحة_في_٤٢_يوماً

#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 3 (Walking with a Friend):***

الناس اللي دائماً تختلقي الأعذار عشان ماتسوين رياضة؟
؛
عندي لكم طريقة ?
ايش رايكم هالويك اند نستبدل خرجتنا مع صحباتنا لممشى ؟ أو ايش رايكم تقترحون على أختك أو أمك في البيت
تروجون للممشى سوا؟
الجو هالأيام لسا مقبول الحمدلله الحقوا قبل يبدأ الصيف فعلياً الى أن تُصبح عادة عندكم وتستمروا حتى لو اشتد الحر
: ( □
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#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة
#طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت
#حمية #حميه #حميه_غذائيه

***Week 4 (Cooking with Siblings):***

فكرتوا مره تدخلوا المطبخ مع الوالدة أو مع أخواتكم وتسوون طبخة صحية أو غير صحية ؟

،

بما انه أمس تكلمنا عن الخضروات وفوائدها قررت أنا وأمي وأختي نتشارك في تقطيع السلطة !
أفضل طريقة عشان تاكلون السلطة أو الفواكة هو المشاركة في تقطيعها !
حتى أخواتكم الصغار خلوهم يشاركوكم الطبخ أو التقطيع!

،

أنا اخترت السلطة كطبق صحي أشارك في إعداده أنا وأهلي .. انتوا ايش بتختاروا أرسلوا لي أي طبق تعدّيه انتِ وأختك أو انتِ والوالدة

#تحدّي_الصحة_في_٤٢_يوماً

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#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 5 (Jump Rope):***


فاكرين شبره أمره شمس نجوم

طيب فاكرين الأسبوع اللي راح ايش قلنا عن رياضة الحبل؟

قلنا ان الحبل سعره رخيص جداً وفائدته اننا نقدر نحرق سعرات حرارية كبيرة في وقت قصير جداً!

،

وقلنا بعد ان خلال ١٠ دقايق فقط تقدروا تحرقوا ١٠٠ سعرة حرارية ?

،

،

جربوا ألعبوها هالمرة مع أخواتكم في البيت أو صديقاتكم وشجعوا بعض

،

#تحدّي_الصحة_في_٤٢_يوماً

،

؛

#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 6 (Walking with Family):***

ايش نوع الرياضة اللي سويتوها اليوم؟

أنا طلعت أنا والوالدة وأختي نتسابق في الحوش

.

الجو هالأيام يحمّس للجري والمشي في الحوش..

حمّسوا أخواتكم واطلعوا تسابقوا في الحوش وخلوهم يحمّلوا تطبيق عداد الخطوات معاكم وتنافسوا مين الأكثر خطوة ?!

،

اللي تطبق الكلام ترفع يدها ?!

#_في_الصحة_تحدّي_٤٢يوماً_

## Topic 5 “Self Monitoring & Self Regulation”

***Week 1:***


عندكم علم بأن الوزن يتغير خلال اليوم ؟

أفضل طريقة لقياس الوزن هي قياسه مرة واحدة كل أسبوع!

[تذكري]: قياس وزنك كل أسبوع يساعدك في الوصول الى هدفك

#تحدّي_الصحة_في_٤٢_يوماً

،

،

#تغذية #تحدي #صحة #وزن #وزني #الرياض #طالبات #سمنة #رشاقة #نحافة #فواكة #خضروات #رياضة #وزن _مثالي #جامعة_الأميرة_نورة #جامعة_الاميرة_نوره

***Week 2 (Challenge):***


ماسألتوا عن تحدّي هالأسبوع

قسيمة الشراء المجانية بقيمة ٩٣ ريال من #الأمازون حق هالأسبوع بتروح للمتشاركة اللي ترسل لي تقارير يومية أكثر ابتداءاً من اليوم وحتى آخر يوم في الدراسة الى يوم ١٢ ابريل / ٢٦ رجب

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انطلقوا

#تحدّي_الصحة_في_٤٢_يوماً

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#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 3 (Sharing is Caring):***

مين تحب الكيك وحارمة نفسها هالأيام عشان ينزل وزنها؟

الآن من يوم بدأنا كمّلنا ٣ أسابيع مع بعض الحمدلله  تستاهلون قطعة كيك مكافأه لكم ؟

؛

أحسن شي اننا مانحرم نفسنا من شئ لكن نراقب نفسنا ونراقب الكميات اللي ناكلها خلال اليوم !

ساعدكم تطبيق #عداد_السعرات بمعرفة السعرات الحرارية لبعض الأطعمة وصرتوا الآن أعرف منّي بالسعرات ولا لا ؟

؛

اليوم ويك اند مافي مشكلة لو تشاركنا قطعة كيك سوا مع من نُحِب

؛

نهاية اسبوع سعيدة

؛

؛

#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 4:***


شخباركم ؟

صامدون ؟

شخبار تطبيق #عداد_السعرات معاكم؟

،

نهاية أسبوع وكلنا غالباً عندنا مناسبات ونخربها شوي! مو مشكلة كلوا بس لا تخربوا اللي سويناه الأسابيع الماضية ! تذوقوا فقط !

،

ولا تنسون تدخلون اللي تاكلونه في التطبيق..

#تحدّي_الصحة_في_٤٢_يوماً

،

،

#تحدي #صحتي #رشاقة #نادي #رياضة #صحة #بدانه #رشاقة #لياقة #الرياض #طالبات #جامعة #طالبات_جامعة_الاميره_نوره #طالبات_جامعة_الأميرة_نورة #تغذية #نحافة #سمنة #سمنة #ريجيم #دايت #حمية #حميه #حميه_غذائيه

***Week 5:***


شخباركم

أدري نهاية أسبوع وكلنا نخربط بس لاتنسون تدخلون اللي تناولتوه اليوم وفي الأيام القادمة..

،

كيف التطبيق معاكم؟ استفدتوا منه؟ ساعدكم في معرفة السعرات الحرارية؟

تقدروا تحسبوا لي السعرات الحرارية من نفسكم؟

،

وكيف تطبيقات عداد الخطوات؟ تراقبوا نتائجكم يومياً!

،

لاتهدموا اللي بنيتوه ال ٥ أسابيع اللي راحت

ماشاء الله قدمتوا جهد تشكرون عليه

#تحدّي_الصحة_في_٤٢_يوماً

؛

***Week 6:***


الحمدلله خلّصنا ٦ أسابيع مع بعض

أتمنى إنكم استمتعوا واستفدتوا جميعاً بالأسابيع الماضية

،

أتمنى تحافظون على الأشياء التالية وماتخربون اللي بنيتوه الفترة السابقة:

- أكل الخضار والفواكه يومياً (٧-٨ حصص يومياً) لنتجنب الأمراض المزمنة والإمساك والسمنة.

- مراقبة الخطوات اليومية.

- ادخال الأكل بشكل يومي في تطبيق عداد السعرات الى أن تتمكني من معرفة السعرات الحرارية الموجودة في كل وجبة.

- وزن الجسم أسبوعياً وليس يومياً.

،

أشكر لكم مشاركتكم وتفاعلك جميعاً

،

بأذن الله بكون متواجدة طوال الأسبوع القادم لأخذ قياساتكم مرة أخرى..

#تحدّي_الصحة_في_٤٢_يوماً

Appendix 10.

*Satisfaction Scale*

| ***Item*** | ***Disagree*** | ***Natural*** | ***Somewhat Agree*** | ***Agree*** |
|---|---|---|---|---|
| Did the daily food log help you think about your portions? | | | | |
| I will continue using the self-tracking app or any similar app | | | | |
| Instagram pictures/videos motivated me to consume fruits and vegetables | | | | |
| Instagram topics motivated me to consume fruits and vegetables | | | | |
| In general, Instagram posts were interested and helpful | | | | |
| I will participate in a similar study in future | | | | |
| I will encourage my friends and relatives to participate in similar research | | | | |
| I will continue applying what I've learned | | | | |
| In general, the study was easy | | | | |
| Using multiple apps in the study were annoying | | | | |

Appendix 11.

*Modified Nutrition Knowledge Questionnaire*

The first few items are about what advice you think experts are giving us

**1- How many servings of fruit and vegetables a day do you think experts are advising people to eat? (One serving could be, for example, an apple or a handful of chopped carrots)**

**1- Do you think these are high or low in protein? (tick one box per food)**

1. Chicken
2. Cheese
3. Fruits
4. Baked beans
5. Butter
6. Cream

**2- Do you think these are high or low in fiber? (tick one box per food)**

1. Corn flakes
2. Bananas
3. Eggs
4. Red meat
5. Broccoli
6. Nuts
7. Fish
8. Baked potatoes with skin
9. Chicken
10. Baked beans

**3- A glass of unsweetened fruit juice counts as a helping of fruit.**

1. Agree
2. Disagree
3. Not sure

4- **There is more protein in a glass of whole milk than in a glass of skimmed milk.**
    1. Agree
    2. Disagree
    3. Not sure

5- **Which of these breads contain the most vitamins and minerals? (tick one)**
    1. White
    2. Brown
    3. Wholegrain
    4. Not sure

**This section is about health problems or diseases**

6- **Do you think these help to reduce the chances of getting certain kinds of cancer?**
    1. Eating more fiber
    2. Eating less sugar
    3. Eating less fruit
    4. Eating less salt
    5. Eating more fruit and vegetables
    6. Eating less preservatives/additives

7- **Do you think these help prevent heart disease? (answer each one)**
    1. Eating more fiber
    2. Eating less saturated fat
    3. Eating less salt
    4. Eating more fruit and vegetables
    5. Eating less preservatives/additives

Appendix 12.

*Additional Nutrition Knowledge Questionnaire "Post-Intervention"*

1. **Myplate consists of carbohydrates, fruits, vegetables, and meat. The largest amount is:**
    1. Meats
    2. Carbohydrates
    3. Vegetables
    4. Fruits
2. **How many servings of fruits the adult needs per day (1 serving= 1 apple)**
    1. 1-2 servings
    2. 2-3 servings
    3. 3-4 servings
    4. 5-6 servings
3. **How many cups of vegetables does an adult need daily?**
    1. 1 cup
    2. 2 cups
    3. 2 ½ cup
    4. 3 cups
4. **Non meat protein sources includes: (you can select more that 1 option)**
    1. Lentils
    2. Hummus
    3. Peas
    4. Beans
    5. Foul
5. **How many calories should not be exceeded in a snack?**
    1. Not more than 50 calories
    2. Not more than 100 calories
    3. Not more than 150 calories

**6. Give examples of 3 snacks.**

**7. How many calories in a cup of rice?**

1. 50
2. 80
3. 100
4. 120

**8. How many calories you could burn after 15 minutes of taking the stairs?**

1. 50
2. 100
3. 150
4. 200

**9. How many calories you could burn jump in a minute??**

1. 10
2. 15
3. 20

Appendix 13.

*Social Support and Eating Habits Survey "Family"*

Please rate each question twice. Under family, rate how often anyone living in your household has said or done what is described during the last three months. Under friends, rate how often your friends, acquaintances, or coworkers have said or done what is described during the last three months.

During the past three months, **my family** (or members of my household):

i. Encouraged me not to eat "unhealthy foods" (cake, salted chips) when I'm tempted to do so
ii. Discussed my eating habit. Changes with me (asked me how I'm doing with my eating changes)
iii. Reminded me not to eat high fat, high salt foods
iv. Complimented me on changing my eating habits ("Keep it up", "We are proud of you ")
v. Commented if I went back to my old eating habits
vi. Ate high fat or high salt foods in front of me
vii. Refused to eat the same foods I eat
viii. Brought home foods I'm trying not to eat
ix. Got angry when I encouraged them to eat low salt, low fat foods
x. Offered me food I'm trying not to eat

Appendix 14.

*Social Support and Eating Habits Survey "Family"*

Please rate each question twice. Under family, rate how often anyone living in your household has said or done what is described during the last three months. Under friends, rate how often your friends, acquaintances, or coworkers have said or done what is described during the last three months.

During the past three months, **my friends**:

i. Encouraged me not to eat "unhealthy foods" (cake, salted chips) when I'm tempted to do so
ii. Discussed my eating habit. Changes with me (asked me how I'm doing with my eating changes):
iii. Reminded me not to eat high fat, high salt foods
iv. Complimented me on changing my eating habits ("Keep it up", "We are proud of you ")
v. Commented if I went back to my old eating habits
vi. Ate high fat or high salt foods in front of me
vii. Refused to eat the same foods I eat
viii. Brought home foods I'm trying not to eat
ix. Got angry when I encouraged them to eat low salt, low fat foods
x. Offered me food I'm trying not to eat

Appendix 15.

*Social Support and Exercise Survey "Family"*

Below is a list of things people might do or say to someone who is trying to exercise regularly. If you are not trying to exercise, then some of the questions may not apply to you, but please read and give an answer to every question.

Please rate each question twice. Under family, rate how often anyone living in your household has said or done what is described during the last 6 weeks. Under friends, rate how often your friends, acquaintances, or coworkers have said or done what is described during the last six weeks.

Please write one number from the following rating scale in each space:

**Family**

i. Exercised with me
ii. Offered to exercise with me
iii. Gave me helpful reminders to exercise ("Are you going to exercise tonight?")
iv. Gave me encouragement to stick with my exercise program
v. Changed their schedule so we could exercise together
vi. Discussed exercise with me
vii. Complained about the time I spend exercising
viii. Criticized me or made fun of me for exercising
ix. Gave me rewards for exercising (bought me something or gave me something I like)
x. Planned for exercise on recreational outings
xi. Helped plan activities around my exercise
xii. Asked me for ideas on how they can get more exercise
xiii. Talked about how much they like to exercise

Appendix 16.

*Social Support and Exercise Survey "Friends"*

Below is a list of things people might do or say to someone who is trying to exercise regularly. If you are not trying to exercise, then some of the questions may not apply to you, but please read and give an answer to every question.

Please rate each question twice. Under family, rate how often anyone living in your household has said or done what is described during the last 6 weeks. Under friends, rate how often your friends, acquaintances, or coworkers have said or done what is described during the last six weeks.

Please write one number from the following rating scale in each space:

**Friends**

i. Exercised with me
ii. Offered to exercise with me
iii. Gave me helpful reminders to exercise ("Are you going to exercise tonight?")
iv. Gave me encouragement to stick with my exercise program
v. Changed their schedule so we could exercise together
vi. Discussed exercise with me
vii. Complained about the time I spend exercising
viii. Criticized me or made fun of me for exercising
ix. Gave me rewards for exercising (bought me something or gave me something I like)
x. Planned for exercise on recreational outings
xi. Helped plan activities around my exercise
xii. Asked me for ideas on how they can get more exercise
xiii. Talked about how much they like to exercise

Appendix 17.

*Eating Habits Confidence Survey / <u>Self Efficacy</u>*

Below is a list of things people might do while trying to change their eating habits. We are mainly interested in salt and fat intake, rather than weight reduction.

Whether you are trying to change your eating habits or not, please rate how confident you are that you could really motivate yourself to do things like these consistently, for at least six months.

Please circle one number for each item: How sure are you that you can do these things?

i. Get up early, even on weekends, to exercise
ii. Stick to your low fat, low salt foods when you feel depressed, bored, or tense
iii. Stick to your low fat, low salt foods when there is high fat, high salt food readily available at a party
iv. Stick to your low fat, low salt foods when dining with friends or co-workers
v. Stick to your low fat, low salt foods when the only snack close by is available from a vending machine
vi. Stick to your low fat, low salt foods when you are alone, and there is no one to watch you
vii. Cook smaller portions so there are no leftovers
viii. Eat lunch as your main meal of the day, rather than dinner
ix. Eat smaller portions of food at a party
x. Eat salads for lunch
xi. Add less salt than the recipe calls for
xii. Eat unsalted peanuts, chips, crackers, and pretzels
xiii. Avoid adding salt at the table
xiv. Eat unsalted, unbuttered popcorn
xv. Keep the salt shaker off the kitchen table
xvi. Eat meatless (vegetarian) entrees for dinner
xvii. Substitute low or non-fat milk for whole milk at dinner
xviii. Cut down on gravies and cream sauce
xix. Eat poultry and fish instead of red meat at dinner
xx. Avoid ordering red meat (beef, pork, ham, lamb) at restaurants

| **I know I cannot** | | **Maybe I can** | | **I know I can** | **Does not apply** |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 8 |

Appendix 18.

*Exercise Confidence Survey / Self Efficacy*

Below is a list of things people might do while trying to increase or continue regular exercise. We are interested in exercises like running, swimming, brisk walking, bicycle riding, or aerobics classes.

Whether you exercise or not, please rate how confident you are that you could really motivate yourself to do things like these consistently, for at least six months.

Please circle one number for each question. How sure are you that you can do these things?

i. Get up early, even on weekends, to exercise
ii. Stick to your exercise program after a long, tiring day at work
iii. Exercise even though you are feeling depressed
iv. Set aside time for a physical activity program; that is, walking, jogging. swimming, biking, or other continuous activities for at least 30 minutes, 3 times per week
v. Continue to exercise with others even though they seem too fast or too slow for you
vi. Stick to your exercise program when undergoing a stressful life change (e.g., divorce, death in the family, moving)
vii. Stick to your exercise program when you have household chores to attend to
viii. Stick to your exercise program even when you have excessive demands at work
ix. Stick to your exercise program when social obligations are very time consuming
x. Read or study less in order to exercise more

| **I know I cannot** | | **Maybe I can** | | **I know I can** | **Does not apply** |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 8 |

Appendix 19.

*Food Frequency Questionnaire*

FOOD FREQUENCY QUESTIONNAIRE

The following food frequency questionnaire is designed to estimate you usual eating pattern. For each food listed, check the box indication how often during the past year you usually ate the amount specified in the parentheses.

If you ate a food only at certain times of year (ex. summer), average your intake over the year. The pattern you report should reflect usual eating habits no the pattern of a short term diet, some other unusual circumstance, or what you think you should eat.

The boxes include monthly, weekly and daily categories:

Never or (about) less than once a month (<1/month)
1-3 (times) per month
1 per week (about once a week)
2-4 (times) per week
5-7 times a week (or about once a day)
2-3 times a day
4 + times a day

Note that the "5-7 times a week" category is a frequency pattern of about "once a day".

For example, foods you never or rarely eat would be checked "never". A food eaten only a few times during a particular season would Also be checked "never". Foods eaten only a few times during the week or eaten a few times on the weekend would be checked "2-4 times a week". A food eaten more than once a day would checked "2-3 times a day" or "4 + times a day" depending on your eating pattern.

If you cannot estimate your usual intake of the food for any reason, leave the item blank.

Name _____ Work Phone _____
Address _____ Home Phone _____

ID TYPE
ID
C_____ 1-5
FFREQ 6-1(

| | FOOD AND AMOUNTS PER SERVING | Average Use Last Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Never or < 1 / month | 1-3 per month | 1 per week | 2-4 per week | 1 per day | 2-3 per day | 4 + per day | |
| | (for code use only) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |
| | **Meats and Other Alternatives** | | | | | | | | |
| SKINCHIK | Chicken or turkey, with the skin (serving) | | | | | | | | 11 |
| NOSKINCH | Chicken or turkey, no skin (serving) | | | | | | | | 12 |
| LIVER | Liver, brains, kidneys, sweetbreads (serving) | | | | | | | | 13 |
| HOTDOG | Hot dog, frankfurter (1) | | | | | | | | 14 |
| BACON | Bacon (2 slices) | | | | | | | | 15 |
| PROCESSD | Processed luncheon meats (sausage, salami, bologna, liverwurst, packaged beef or chicken) (piece or slice) | | | | | | | | 16 |
| CANNED | Canned meats like deviled beef, hash, chili (serving) | | | | | | | | 17 |
| HAMBURG | Hamburger (1) | | | | | | | | 18 |
| BEEF | Beef - chuck, ribs, steak (serving) | | | | | | | | 19 |
| OTHRBEEF | Other beef (round, rump, very lean (serving) | | | | | | | | 20 |
| VEAL | Veal (serving) | | | | | | | | 21 |
| LAMB | Lamb (roast, chops, etc.) (serving) | | | | | | | | 22 |
| PORK | Pork (roast, chops, etc) (serving) | | | | | | | | 23 |
| STEW | Beef, pork or lamb as a sandwich or mixed dish (stew, casserole, etc.) (serving) | | | | | | | | 24 |
| CANTUNA | Canned tuna fish (serving) | | | | | | | | 25 |
| SALMON | Dark meat fish, such as mackerel, salmon, sardines, bluefish, swordfish (serving) | | | | | | | | 26 |
| LOBSTER | Shrimp, lobster, scallops as a main dish (serving) | | | | | | | | 27 |
| OTHRFISH | Other fish (serving) | | | | | | | | 28 |
| EGGS | Eggs (1) | | | | | | | | 29 |
| SOYNUT | Gluten, soy nut or other vegetarian products no used in mixed dishes (serving) | | | | | | | | 30 |
| VEGROAST | Homemade vegetarian roasts, casseroles, etc | | | | | | | | 31 |
| VEGBURGR | Vegetarian links or burgers | | | | | | | | 32 |
| PIZZA | Mixed cheese and tomato dish - pizza, lasagna, etc. (serving) | | | | | | | | 33 |

| | FOOD AND AMOUNTS PER SERVING | Average Use Last Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Never or < 1 / month | 1-3 per month | 1 per week | 2-4 per week | 1 per day | 2-3 per day | 4 + per day | |
| | (for code use only) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |
| | **Dairy Foods and Fats** | | | | | | | | |
| SKIMMILK | Skim mild or skim buttermilk, powder skim milk (cup) | | | | | | | | 34 |
| LOWFMILK | Low fat (1-2%) milk (glass) | | | | | | | | 35 |
| WHOLEMLK | Whole milk (cup) | | | | | | | | 36 |
| SOYMILK | Imitation or soy milk (cup) | | | | | | | | 37 |
| CREAM | Half and half, evaporated milk, cream, sour cream (on fruit, cereal, in coffee, etc. (oz) | | | | | | | | 38 |
| NONDAIRY | Non-dairy creamer (topping or dry coffee creamer) (tsp) | | | | | | | | 39 |
| YOGURTSK | Yogurt from skim milk (cup) | | | | | | | | 40 |
| YOGWHOLE | Yogurt from whole milk (cup) | | | | | | | | 41 |
| SHERBET | Sherbet or ice milk ( ½ cup) | | | | | | | | 42 |
| ICECREAM | Ice cream (½ cup) | | | | | | | | 43 |
| CHESWHOL | Whole milk cottage or ricotta cheese (½ cup) | | | | | | | | 44 |
| CHESLOWF | Low fat cheeses such as skim cottage, skim mozzarella, etc. (slice or oz.) | | | | | | | | 45 |
| CHESOTHR | Other hard cheese (e.g. American, cheddar, etc.) (slice or oz.) | | | | | | | | 46 |
| STIKMARG | Margarine, stick form added to breads or foods: exclude use in cooking(tsp) | | | | | | | | 47 |
| TUBMARG | Margarine, tub form added to breads or foods; exclude use in cooking (tsp) | | | | | | | | 48 |
| BUTTER | Butter (added to food or bread: excluded use in cooking) (tsp) | | | | | | | | 49 |
| | **Fruits** | | | | | | | | |
| APPLE | Fresh apple or pear (1) | | | | | | | | 50 |
| CIDER | Apple juice or cider (small glass) | | | | | | | | 51 |
| APPLSAUC | Applesauce (½ cup) | | | | | | | | 52 |
| ORANGE | Orange or tangerine (1) | | | | | | | | 53 |
| ORNGJUIC | Orange juice (small glass) | | | | | | | | 54 |
| GRAPFRUT | Grapefruit (½) or Grapefruit juice (small glass) | | | | | | | | 55 |
| PEACHES | Peaches, apricots, plums or nectarines (fresh or canned) (1 pc. Or ½ cup) | | | | | | | | 56 |
| RAISINS | Raisins (1 oz. or small pack) or grapes (small bunch) | | | | | | | | 57 |
| PRUNES | Prunes or dry apricots (½ cup) | | | | | | | | 58 |
| DATES | Dates or figs (½ cup) | | | | | | | | 59 |
| BANANAS | Bananas (1) | | | | | | | | 60 |
| STRAWBER | Strawberries- fresh, frozen or canned (½ cup) | | | | | | | | 61 |
| BLACKBER | Blackberries, blueberries, raspberries-fresh, frozen or canned (½ cup) | | | | | | | | 62 |
| MELON | Cantaloupe or honeydew melon (small slice) | | | | | | | | 63 |
| WATERMEL | Watermelon (1 slice) | | | | | | | | 64 |
| PINEAPPL | Pineapple- fresh or canned (½ cup) | | | | | | | | 65 |
| CHERRIES | Cherries- fresh or canned (½ cup) | | | | | | | | 66 |
| PAPAYAS | Papayas (½ cup) | | | | | | | | 67 |
| AVOCADOS | Avocados (¼) | | | | | | | | 68 |
| | **Vegetables** | | | | | | | | |
| GREENBEN | Green or string beans or asparagus (½ cup) | | | | | | | | 69 |
| BROCCOLI | Broccoli (½ cup) | | | | | | | | 70 |
| CABBAGE | Cabbage, cole slaw or sauerkraut (½ cup) | | | | | | | | 71 |
| CAULFLWR | Cauliflower (½ cup) | | | | | | | | 72 |
| BRUSELSP | Brussels sprouts (½ cup) | | | | | | | | 73 |
| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |

| | | Average Use Last Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **FOOD AND AMOUNTS PER SERVING** | Never or < 1 / month | 1-3 per month | 1 per week | 2-4 per week | 1 per day | 2-3 per day | 4 + per day | |
| | (for code use only) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |
| CARROTS | Carrots (1 whole or ½ cup cooked) | | | | | | | | 74 |
| CAROTJUC | Carrot juice (small glass) | | | | | | | | 75 |
| CORN | Corn (ear or ½ cup frozen, fresh or canned) | | | | | | | | 76 |
| SPINACH | Spinach- raw or cooked (½ cup) | | | | | | | | 77 |
| PEPPERS | Green or red peppers (½ cup) | | | | | | | | 78 |
| KALE | Kale, mustard, chard, beet or other greens (½ cup) | | | | | | | | 79 |
| ICEBERG | Iceberg or head lettuce (cup) | | | | | | | | 80 |
| ROMAINE | Escarole, romaine, watercress or leaf lettuce (cup) | | | | | | | | 81 |
| PEAS | Peas, lima beans or pea pods (½ cup) | | | | | | | | 82 |
| WINTERSQ | Yellow (winter) squash or pumpkin (½ cup) | | | | | | | | 83 |
| ZUCCHINI | Eggplant, zucchini, other summer squash (½ cup) | | | | | | | | 84 |
| YAMS | Yams and sweet potatoes ( ½ cup) | | | | | | | | 85 |
| TOMATOES | Tomatoes (1 or ½ cup) | | | | | | | | 86 |
| TOMJUICE | Tomato juice (small glass) | | | | | | | | 87 |
| CHILSAUC | Red chili sauce (tbsp) | | | | | | | | 88 |
| TOFU | Tofu or soy bean curd (½ cup) | | | | | | | | 89 |
| LENTILS | Lentils, chick peas, kidney, pinto or other beans- plain or baked, not used in casseroles, soups, etc (½ cup) | | | | | | | | 90 |
| | **Sweets and Baked Goods** | | | | | | | | |
| PIEHOME | Pie, homemade (slice) | | | | | | | | 91 |
| PIEREADY | Pie, ready made (slice) | | | | | | | | 92 |
| CAKEHOME | Cake, home baked (slice) | | | | | | | | 93 |
| CAKREADY | Cake, ready made (slice) | | | | | | | | 94 |
| COOKIESH | Cookies, home baked (1) | | | | | | | | 95 |
| COOKIESR | Cookies, ready baked (1) | | | | | | | | 96 |
| BROWNIES | Brownies (1) | | | | | | | | 97 |
| DOUGHNUT | Doughnut (1) | | | | | | | | 98 |
| SWEETROL | Sweet roll, coffee cake, pastry, home baked (serving) | | | | | | | | 99 |
| CRACKERS | Crackers, all kinds (serving) | | | | | | | | 100 |
| | **Breads, Cereals, Starches** | | | | | | | | |
| CEREAL | Refined uncooked cereals like cornflakes, cheerios (½ cup) | | | | | | | | 101 |
| OATMEALR | Refined hot cereals like cream of wheat, instant oatmeal, etc (½ cup) | | | | | | | | 102 |
| BRANU | Unrefined cold cereals like all bran, alpen, granola, shredded wheat, etc (½ cup) | | | | | | | | 103 |
| OATMEALU | Unrefined cooked cereals like oatmeal, ralston, cracked wheat, etc. (½ cup) | | | | | | | | 104 |
| ENRBREAD | Enriched breads like white, sourdough, french, italian, corn or "unbleached flour" breads (slice) | | | | | | | | 105 |
| WHOLGRBR | Whole grain breads like 1oo% whole wheat, stoneground whole wheat, sprouted wheat, 7 grain bread etc. (slice) | | | | | | | | 106 |
| OTHRBRED | Other breads- cracked, wheat, rye and other partial whole grains (slice) | | | | | | | | 107 |
| COMROLLS | Commercial dinner rolls, biscuits, hot dog or hamburger rolls, buns, muffins. etc (1) | | | | | | | | 108 |
| HOMEROLS | Home made rolls, biscuits, muffins, etc (1) | | | | | | | | 109 |
| CHIPS | Potato chips, fritos, tortilla chips, pretzels, etc. (oz.) | | | | | | | | 110 |
| FRNCHFRY | French fried potatoes | | | | | | | | 111 |
| POTATOSK | Potatoes with skins eaten (1) | | | | | | | | 112 |
| POTNOSKN | Potatoes without skins except french fries (½ | | | | | | | | 113 |

| | | Average Use Last Year | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **FOOD AND AMOUNTS PER SERVING** | Never or < 1 / month | 1-3 per month | 1 per week | 2-4 per week | 1 per day | 2-3 per day | 4 + per day |
| | (for code use only) | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| TURNIPS | Parsnips and turnips (½ cup) | | | | | | | |
| PANCAKES | Pancakes or waffles or french toast (slice) | | | | | | | |
| BRWNRICE | Brown rice (cup) | | | | | | | |
| WHITRICE | White rice (cup) | | | | | | | |
| PASTA | Pasta (spaghetti, noodles, etc) (cup) | | | | | | | |
| OTHRGRAN | Other grains, e.g. bulger, kasha, barley, couscous (cup) | | | | | | | |
| | **Beverages** | | | | | | | |
| COFFEE | Coffee (cup) | | | | | | | |
| TEA | Tea (cup) | | | | | | | |
| COCOA | Cocoa (cup) | | | | | | | |
| DECAFCOF | Decaffeinated coffee, herbal tea, or Postum (cup) | | | | | | | |
| CAFPEPSI | Caffeinated beverages like Pepsi, Coke, etc (glass or can) | | | | | | | |
| PEPSIFRE | Decaffeinated beverages like Pepsi-free, 7 Up, Ginger ale, Root Beer, etc (glass or can) | | | | | | | |
| DIETPEPS | Caffeinated low-calorie beverages like Diet Pepsi, Diet Coke, etc. (glass or can) | | | | | | | |
| DPEPSFRE | Decaffeinated low-calorie beverages like Diet Pepsi-free, Diet 7 Up, Diet ginger ale, etc (glass or can) | | | | | | | |
| BEER | Beer (bottle or can) | | | | | | | |
| REDWINE | Red wine or sherry (glass) | | | | | | | |
| WITEWINE | White wine (glass) | | | | | | | |
| LIQUOR | Liquor or cordial (1 shot) | | | | | | | |
| LEMONADE | Hawaiian punch, lemonade, or not carbonated fruit drinks (glass of can) | | | | | | | |
| | **Miscellaneous** | | | | | | | |
| PEANTBUT | Peanut butter (tbsp) | | | | | | | |
| POPCORN | Popcorn (cup) | | | | | | | |
| CHOWDER | Chowder or cream soup (cup) | | | | | | | |
| BROTH | Broth soup (cup) | | | | | | | |
| SALDDRES | Mayonnaise or creamy salad dressing including 1000 island, russian, creamy italian, blue cheese dressing (tbsp) | | | | | | | |
| OIL | Oil-Corn, soy, sunflower etc. except olive oil (tbsp) | | | | | | | |
| OLIVEOIL | Olive oil (tbsp) | | | | | | | |
| SEEDS | Seeds like sunflower seeds, etc. (oz) | | | | | | | |
| WALNUTS | Walnuts (5) | | | | | | | |
| NUTSSALT | Other Salted nuts (oz) | | | | | | | |
| NUTSUNSL | Other unsalted nuts (oz) | | | | | | | |
| CUSTARD | Custard (½ cup) | | | | | | | |
| PUDDING | Pudding (½ cup) | | | | | | | |
| CHOCOLAT | Chocolate (small bar) | | | | | | | |
| OTHRCNDY | Candy without chocolate (small bar) | | | | | | | |
| JAMS | Jams, jellies, preserves, syrup (tbsp) | | | | | | | |
| WHEATGRM | Wheat germ (tsp) | | | | | | | |
| YEAST | Brewer's Yeast (tsp) | | | | | | | |
| BRAN | Bran (tsp) | | | | | | | |
| WHITSAUC | White or cream sauces (tbsp) | | | | | | | |
| TOMSAUC | Tomato sauce (tbsp) | | | | | | | |
| GRAVY | Gravy-made from meat (tbsp) | | | | | | | |
| SUGAR | Sugar of honey (tsp) | | | | | | | |
| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) |

| | | Average Use Last Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **FOOD AND AMOUNTS PER SERVING** | Never or < 1 / month | 1-3 per month | 1 per week | 2-4 per week | 1 per day | 2-3 per day | 4 + per day | |
| | (for code use only) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |
| TURNIPS | Parsnips and turnips (½ cup) | | | | | | | | 114 |
| PANCAKES | Pancakes or waffles or french toast (slice) | | | | | | | | 115 |
| BRWNRICE | Brown rice (cup) | | | | | | | | 116 |
| WHITRICE | White rice (cup) | | | | | | | | 117 |
| PASTA | Pasta (spaghetti, noodles, etc) (cup) | | | | | | | | 118 |
| OTHRGRAN | Other grains, e.g. bulger, kasha, barley, couscous (cup) | | | | | | | | 119 |
| | **Beverages** | | | | | | | | |
| COFFEE | Coffee (cup) | | | | | | | | 120 |
| TEA | Tea (cup) | | | | | | | | 121 |
| COCOA | Cocoa (cup) | | | | | | | | 122 |
| DECAFCOF | Decaffeinated coffee, herbal tea, or Postum (cup) | | | | | | | | 123 |
| CAFPEPSI | Caffeinated beverages like Pepsi, Coke, etc (glass or can) | | | | | | | | 124 |
| PEPSIFRE | Decaffeinated beverages like Pepsi-free, 7 Up, Ginger ale, Root Beer, etc (glass or can) | | | | | | | | 125 |
| DIETPEPS | Caffeinated low-calorie beverages like Diet Pepsi, Diet Coke, etc. (glass or can) | | | | | | | | 126 |
| DPEPSFRE | Decaffeinated low-calorie beverages like Diet Pepsi-free, Diet 7 Up, Diet ginger ale, etc (glass or can) | | | | | | | | 127 |
| BEER | Beer (bottle or can) | | | | | | | | 128 |
| REDWINE | Red wine or sherry (glass) | | | | | | | | 129 |
| WITEWINE | White wine (glass) | | | | | | | | 130 |
| LIQUOR | Liquor or cordial (1 shot) | | | | | | | | 131 |
| LEMONADE | Hawaiian punch, lemonade, or not carbonated fruit drinks (glass of can) | | | | | | | | 132 |
| | **Miscellaneous** | | | | | | | | |
| PEANTBUT | Peanut butter (tbsp) | | | | | | | | 133 |
| POPCORN | Popcorn (cup) | | | | | | | | 134 |
| CHOWDER | Chowder or cream soup (cup) | | | | | | | | 135 |
| BROTH | Broth soup (cup) | | | | | | | | 136 |
| SALDDRES | Mayonnaise or creamy salad dressing including 1000 island, russian, creamy italian, blue cheese dressing (tbsp) | | | | | | | | 137 |
| OIL | Oil-Corn, soy, sunflower etc. except olive oil (tbsp) | | | | | | | | 138 |
| OLIVEOIL | Olive oil (tbsp) | | | | | | | | 139 |
| SEEDS | Seeds like sunflower seeds, etc. (oz) | | | | | | | | 140 |
| WALNUTS | Walnuts (5) | | | | | | | | 141 |
| NUTSSALT | Other Salted nuts (oz) | | | | | | | | 142 |
| NUTSUNSL | Other unsalted nuts (oz) | | | | | | | | 143 |
| CUSTARD | Custard (½ cup) | | | | | | | | 144 |
| PUDDING | Pudding (½ cup) | | | | | | | | 145 |
| CHOCOLAT | Chocolate (small bar) | | | | | | | | 146 |
| OTHRCNDY | Candy without chocolate (small bar) | | | | | | | | 147 |
| JAMS | Jams, jellies, preserves, syrup (tbsp) | | | | | | | | 148 |
| WHEATGRM | Wheat germ (tsp) | | | | | | | | 149 |
| YEAST | Brewer's Yeast (tsp) | | | | | | | | 150 |
| BRAN | Bran (tsp) | | | | | | | | 151 |
| WHITSAUC | White or cream sauces (tbsp) | | | | | | | | 152 |
| TOMSAUC | Tomato sauce (tbsp) | | | | | | | | 153 |
| GRAVY | Gravy-made from meat (tbsp) | | | | | | | | 154 |
| SUGAR | Sugar of honey (tsp) | | | | | | | | 155 |
| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | |

Appendix 20.

*Godin Leisure-Time Exercise Questionnaire*

# Godin Leisure-Time Exercise Questionnaire

During a typical **7-Day period** (a week), how many times on the average do you do the following kinds of exercise for **more than 15 minutes** during your free time (write on each line the appropriate number).

**Weekly leisure activity score** = (9 × Strenuous) + (5 × Moderate) + (3 × Light)

| | Times per week | | Totals |
|---|---|---|---|
| a) **STRENUOUS EXERCISE (HEART BEATS RAPIDLY)** (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling) | | **X9** | |
| b) **MODERATE EXERCISE (NOT EXHAUSTING)** (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing) | | **X5** | |
| c) **MILD/LIGHT EXERCISE (MINIMAL EFFORT)** (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking) | | **X3** | |
| **WEEKLY LEISURE-TIME ACTIVITY SCORE** | | | |

**EXAMPLE**
Strenuous = **3** times/wk
Moderate = **6** times/wk
Light = **14** times/wk
**Total leisure activity score** = (9 × **3**) + (5 × **6**) + (3 × **14**) = 27 + 30 + 42 = 99

| **Godin Scale Score** | **Interpretation** |
|---|---|
| 24 units or more | Active |
| 14 – 23 units | Moderately Active |
| Less than 14 units | Insufficiently Active/Sedentary |

*Adapted from: Godin, G. (2011). The Godin-Shephard leisure-time physical activity questionnaire. Health & Fitness Journal of Canada, 4(1), 18-22.*

ONS® Oncology Nursing Society

# VITA

## ABEER HUSSAIN ALSSAFI

Born, Riyadh, Saudi Arabia

| | |
|---|---|
| 2010 | B.A., King Saud University<br>Riyadh, Saudi Arabia |
| 2014 | M.S., Florida International University<br>Miami, Florida |
| 2018 | P.h.D., Florida International University<br>Miami, Florida |

## POSTERS AND PRESENTATIONS

- Alssafi, A.H., Krishnakumar, P., Gonzalez-Rebull, E., and Coccia, CC. (October, 2018). *Development of a Social Media-Based Intervention for Preventing Weight Gain among Female College Students.* Poster presented at the Food & Nutrition Conference & Expo, Washington, D.C.

- Earle, S., Matthysse, A., Alssafi, A.H., Lara-Gonzale, C., and Coccia, C.C. (October, 2018). *Urban Vegetable Project 2: Changing Knowledge and Health Behaviors in Adolescents*. Poster presented at the Food & Nutrition Conference & Expo, Washington, D.C.

- Maria, D.S., Alssafi, A.H., and Coccia, C.C. (October, 2017). *The Food Selfie Project: Eating Behaviors of Dietetic Students Through the Use of Instagram*. Poster presented at the Food & Nutrition Conference & Expo, Chicago, IL.

- Alssafi, A., Aldaghri, N.M., and Huffman, F.G. (April, 2015). *Determine vitamin D deficiency in Saudi Arabian subjects: Relationship to dietary vitamin D and calcium intake, body mass index, physical activity, and exposure to sun*. Poster presented at the Future of Food and Nutrition, Boston, MA.