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AN EXPLORATION OF COVID-19 AND DIETARY PATTERNS IN COLLEGIATE
ATHLETES

by

Megan Hammel

B.S., University of Central Missouri, 2019

A Research Paper
Submitted in Partial Fulfillment of the Requirements for the
Master of Science

Department of Kinesiology
in the Graduate School
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RESEARCH PAPER APPROVAL

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Megan Hammel

A Research Paper Submitted in Partial

Fulfillment of the Requirements

for the Degree of

Master of Science

in the field of Kinesiology

Approved by:

Dr. Julie Partridge, Chair

Graduate School

Southern Illinois University Carbondale

February 12, 2021

AN ABSTRACT OF THE RESEARCH PAPER OF

Megan Hammel, for the Master of Science degree in Kinesiology, presented on February 12, 2021, at Southern Illinois University Carbondale.

TITLE: AN EXPLORATION OF COVID-19 AND DIETARY PATTERNS IN COLLEGIATE ATHLETES

MAJOR PROFESSOR: Dr. Julie Partridge

PURPOSE: The purpose of this research study is to determine how collegiate athlete's nutritional status and eating habits changed during the COVID-19 home confinement period in spring 2020.

METHODOLOGY: Southern Illinois University Carbondale athletes ($n=52$) completed a modified Renzo, L. D., et al, 2020 questionnaire on SurveyMonkey. Participants were asked questions regarding their personal data, dietary habits, and lifestyle habits related to before and during the spring 2020 COVID-19 home confinement period. The data was analyzed through SurveyMonkey and described utilizing a quantitative and qualitative approach.

RESULTS: A total of 52 participants took part in the research study. All 52 participants met the inclusion criteria of having academic status at SIUC, being between 18-24 years old, being a collegiate athlete, and completing the consent form and questionnaire (see Table 1). Athletes with a typical fall ($n = 24$), winter ($n = 7$), and spring ($n = 20$) competitive season participated in the study.

CONCLUSION: The results of this study indicate that various changes to lifestyle, eating, and general health habits of SIU athletes did occur between pre- and during COVID-19 home confinement during March through May of 2020.

KEYWORDS: Athletes, COVID-19 Home Confinement

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CHAPTER 1

INTRODUCTION

Proper nutrition is an invaluable tool used to fuel training and performance in physically active individuals or athletes. Each macronutrient, carbohydrates (CHO), protein, and fat provide numerous benefits to support, sustain, and improve performance by providing energy for exercise, maximizing muscle mass and strength gains, and metabolic adaptations (Karpinski & Rosenbloom, 2017). A diet that consists of adequate macro- and micronutrients is also correlated with reduced fatigue, which allows for an “athlete to train and compete longer or recover faster between training sessions” (Lin & Lee, 2005) achieving and maintaining overall health. Adherence to a nutritious diet is largely emphasized in sports nutrition, but even greater emphasis is placed on individualized meal plans for each athlete’s training demands.

The International Society for Sport Nutrition (ISSN) and the American College of Sports Medicine (ACSM) recommend that athletes consume adequate energy to fuel their training and competition demands through determination of energy requirements based on the athlete’s level of physical activity and body weight (Potgieter, 2012). Physical activity levels include general physical activity (30-40 minutes a day, three days a week), moderate levels of intense training (2 to 3 hours a day, 5 to 6 days a week), high-volume intense training (3 to 6 hours a day, 1 to 2 sessions a day, 5 to 6 days a week); and elite and large athletes (depends on training periods, volume, and intensity of training) (Potgieter, 2012).

General nutrition recommendations for athletes are broken down into caloric, CHO, protein, fat, and micronutrient intake, and hydration before, during, and after training has ceased. Adequate CHO consumption daily is necessary to “replenish muscle and liver glycogen between training sessions and competitive events...”, as well as to meet the athlete’s energy requirement

(Karpinski & Rosenbloom, 2017, p. 22, para.2). CHO recommendations range from “three to twelve grams of CHO per kilogram of body weight per day” (Karpinski & Rosenbloom, 2017), with specific timing consumption based on training sessions and competitive events, and intensity level. Ingestion of CHO before, during, and after exercise enhances CHO availability in muscles and the central nervous system to optimize performance (Academy of Nutrition and Dietetics, 2016).

Protein, a macronutrient, also plays a role in optimizing athletic performance through repairing and strengthening muscle tissue. The Academy of Nutrition and Dietetics (AND) recommends that athletes consume at least 1.2 to 2.0 grams of protein per kilogram of body weight per day, depending on training frequency, volume, and intensity. Moreover, sufficient protein ingestion should be spaced within four to five meals per day to optimize skeletal muscle adaptive responses. An adequate amount of protein is essential for an athlete because it aids in maximizing muscle mass gains and improving strength, promotes metabolic function adaptations, preserves lean mass during rapid weight loss, and has provides numerous structural benefits to protein-containing non-muscle tissues (Karpinski & Rosenbloom, 2017).

Modifications to nutritional intake are very common to promote injury healing and management. These modifications do not include independent nutrient adjustments, instead, it simply emphasizes the importance of a nutritious diet that will meet the nutrient and caloric intake required for healing. However, nutrients recommended for the recovery process include calories, protein, vitamin C, zinc, calcium, phosphorus, and magnesium (Rodriguez, 1999). In addition, the caloric and protein needs of an injury recovering athlete are high; therefore, it is crucial that requirements are increased from non-injury nutrient requirements. As previously mentioned, micronutrients are an important component to the healing and recovery process. For

example, additional vitamin C and zinc are needed to promote the healing of muscle tears. “Recovery from skeletal trauma will emphasize the need for appropriate intakes of calcium, phosphorus, and other nutrients essential to bone remodeling such as vitamins A and D, magnesium, etc.” (Rodriguez, 1999, p. 30-31). Specifically, to joint repair and collagen synthesis, vitamin C and amino acids, such as proline and glycine is best. Most importantly to injury recovery, it is important that athletes are aware that their nutrient intake should promote injury recovery not weight management (Rodriguez, 1999).

Similar to time off while healing an injury, nutritional recommendations also change during the offseason. During the offseason many athletes’ schedules change, therefore, it is important to compensate for the differences in their daily routines and training schedules by adjusting their nutrient intake. The Collegiate and Professional Sports Dietitians Association (CPSDA) emphasizes the importance of creating a healthy balance between nutrient intake and training volume. Suggestions for a healthy balance include focusing on consuming “real” foods rather than convenience foods, such as bars and pre-packaged shakes; trying new recipes and foods, logging nutrient intake to learn about daily eating habits, and making ample time for rest (CPSDA, 2014). The offseason is known as the ‘recovery phase’ for collegiate athletes because they are given time to reflect on the season, plan for the upcoming season, and adjust their nutrient intake. These adjustments can either help the athlete to gain, lose, or maintain body composition for the upcoming season, with hope that it will help them achieve a potential performance advantage. Body composition goals for the offseason might include “1) maintain competition weight and preserve skeletal muscle 2) increase skeletal muscle mass 3) decrease body fat 4) increase skeletal muscle mass and decrease body fat simultaneously 5) increase skeletal muscle mass and slightly increase body fat or 6) increase body fat” (Mangieri, 2014, p.

1). No matter the offseason goal, it is important that the athlete recognize that changes in body composition will occur during the offseason through adipose tissue accumulation and muscle mass loss due to a reduction in nutrient requirements and training should also be stressed (Mangieri, 2014). These changes to the body can negatively affect performance once the upcoming season begins.

Before the offseason begins, it is crucial that athletes receive nutrition education regarding changes in their nutrient intake. A study conducted on NCAA Division 1 baseball players found that the athletes believed a nutritious diet would improve their field success, but a pre-intervention sports nutrition questionnaire found that many lacked basic nutrition knowledge. The intervention focused on the importance of nutrition, specifically for baseball performance. Nutrition topics discussed during the intervention included food preparation, transport, and storage; the role of macro- and micronutrient for fuel, food sources, and timing; portion sizes, individual nutrient requirements, body weight maintenance, supplement safety, and hydration (Rossi et al., 2017). Following completion of the intervention, many of the baseball players significantly increased their consumption of calories ($p < 0.001$), protein ($p = 0.002$), and fat ($p = 0.001$), as well as nutrition knowledge ($p < 0.001$). Whereas carbohydrate consumption had no significant change from pre- to post-intervention ($p > 0.05$) (Rossi, Landreth, Beam et al., 2017). Performance components, vertical jump ($p < 0.001$), broad jump ($p = < 0.001$), and 1 RM squat ($p < 0.001$), also improved after following the nutrition education intervention (Rossi et al., 2017). Although the likely cause for improved performance was an increase in protein consumption due to its effects on metabolic rate, the baseball players still increased their sport nutrition knowledge from pre- to post-intervention. The findings of this study are similar to a study conducted on college female athletes (Abood, Black, Birnbaum et al., 2004) and NCAA

female volleyball players (Valliant, Pittman, Kieckhaefer, & Garner, 2012).

Nutrition knowledge was also investigated in a women's soccer team and women's swim team through a nutrition education intervention. The primary focus of the intervention was to determine the women's nutrition knowledge, self-efficacy in choosing healthy foods, and dietary practices that can affect treatment effect. Results suggested that the athletes who participated in the nutrition intervention significantly improved their "nutrition knowledge, self-efficacy ($P < .05$), and overall number of positive dietary changes ($p < .03$)" (Abood et al., 2004, p. 137).

Sports nutrition knowledge also improved after a NCAA female volleyball team received nutrition education from a registered dietitian, as well as improvements in total energy and macronutrient intake. Prior to the intervention volleyball players failed to meet the recommended macronutrient intake for physically active females during the two off seasons. Findings of low energy availability and macronutrient intake is a major nutritional concern, especially regarding the high energy demands during off season training. Moreover, previous reports suggest that female athletes with low caloric intake might also have low micronutrient intakes, which can lead to potential micronutrient deficiencies in calcium, iron, magnesium, zinc, and B-complex vitamins (Valliant et al., 2012). Fortunately, the nutrition intervention led to a significant increase in calorie, carbohydrate, and protein intake, and nutrition knowledge. Therefore, indicating that "dietary education is useful in improving dietary intake and nutrition knowledge among female athletes" (Valliant et al., 2012). Results from these three research studies emphasize the importance of proper nutrition education prior to the start of offseason so that athletes can maintain their healthy eating habits and behaviors.

The 2020 calendar year brought about many economic and societal challenges due to the coronavirus (COVID-19) pandemic. Many strategies to reduce the number of confirmed cases

were put into place, such as maintaining six feet of distance from other individuals (social distancing), canceling mass gathering events, wearing masks, and enforcing lockdowns or home confinement. Specific to collegiate athletes, COVID-19 ceased sporting events across the world causing athletes to adopt different training and preparation routines for competitive events (Andreato, Coimbra, & Andrade, 2020). In other words, causing a forced off season due to the COVID-19 lockdown or home confinement orders. Consequently, athletes were forced to make changes to their training routines, dietary habits, and daily lives because they no longer had competitions to prepare for. Throughout the home confinement orders, numerous exercise professionals stressed the importance of maintaining a training routine specific to each sport to maintain muscle mass, “minimize the effects of detraining and to facilitate the return to a normal routine after the home confinement” (Andreato et al., 2020). In addition, continuation of daily training routines might have helped to reduce tension and stress during the home confinement period. Finally, attention to athlete’s dietary habits during this time was of comparable importance to training routines. During this time many athletes were experiencing a reduction in exercise intensity, volume, and time; therefore, reducing the number of calories needed to sustain daily living. Athletes might have also experienced over consumption of food due to stress and the uncertainty during the home confinement period. If possible, nutrition recommendations during the COVID-19 lockdown include “reduction in macronutrient portion sizes; reduction, or even discontinuation, of the use of dietary supplements; prioritization of foods that can benefit the immune system; and avoiding ultra-processed foods” (Andreato et al., 2020, p. #). Dietary alterations that should have been emphasized consist of consuming adequate protein during each meal, which provides good sources of iron, zinc, vitamin B12; and fruits and vegetables that provide antioxidants, and vitamin C to the diet (Andreato et al., 2020). Similar to time off during

an injury, athletes should give themselves grace when trying to cope with the new changes to their daily lifestyle, training patterns, and eating habits.

For these reasons, the purpose of this research study is to determine how collegiate athlete's nutritional status and eating habits changed during the COVID-19 home confinement period in spring 2020. Based on current knowledge, it was hypothesized that athlete's nutritional habits changed from pre- to during the COVID-19 home confinement period by consuming less nutritionally dense foods. As well as an increase in highly processed foods and sleep, and a reduction in training. COVID-19 was filled with a lot of uncertainty for many athletes, as they were not able to continue with their typical training and eating schedule, did not receive guidance from coaches, and were unsure of what their season would consist of. Therefore, many athletes chose to neglect their nutrition and/or training schedules to make it through the unprecedented time of the COVID-19 home confinement period (March 2020 to May 2020).

CHAPTER 2

METHODOLOGY

The present study reports on a sample of 52 college students at Southern Illinois University Carbondale (SIUC). Participants received an email from Head Strength and Conditioning Coach, Meade Smith, outlining the purpose of the research study and a link to the SurveyMonkey questionnaire. Participants were asked to indicate consent (see Appendix A) and then completed a questionnaire (see Appendix B). Athletic participants completed these forms during one of their lifting sessions in the SIUC Lingle Hall weight room. In the first page of the SurveyMonkey questionnaire, participants were then guided to a consent form, which required them to select ‘I agree’ to proceed to the questionnaire. Following completion of the questionnaire, participants submitted their answers and completed their participation.

This study’s questionnaire utilized a modified questionnaire from Renzo et al., 2020. Questions related to pre- and during COVID-19 in the Renzo et al., 2020 study were utilized for this study and questions that did not pertain to this topic were excluded. Questions that were modified from Renzo et al. used a Likert-type scale, and additional questions were provided that were open-ended to allow for more depth to the answers. The survey utilized questions regarding participants’ personal data, dietary habits, and lifestyle habits related to before and during the spring 2020 COVID-19 home confinement period. Descriptive statistics from the quantitative questions were analyzed through SurveyMonkey. The open-ended questions were analyzed inductively, as the author and her advisor read the content separately to identify units of meaning (i.e., themes), and then reached consensus on the content analysis presented below. The Southern Illinois University Carbondale Institutional Review Board approved the study protocol prior to beginning the study.

CHAPTER 3

RESULTS

A total of 52 participants took part in the research study. All 52 participants met the inclusion criteria of having academic status at SIUC, being between 18-24 years old, being a collegiate athlete, and completing the consent form and questionnaire (see Table 1). Athletes with a typical fall ($n = 24$), winter ($n = 7$), and spring ($n = 20$) competitive season participated in the study. Of the 52 participants, 13 lived at home with family, 12 lived on campus, and 26 lived in off campus housing during the 2020 home confinement period. None of the participants who completed the questionnaire were excluded from the study.

| Sex | | Age | | Academic Year | | Normal Competitive Season | |
|--|----|----------------|----|---------------|--------------------|---------------------------|----|
| Male | 21 | 18-19 years | 19 | Freshman | 15 | Fall | 24 |
| Female | 30 | 20-21 years | 20 | Sophomore | 9 | Winter | 7 |
| | | 22-23 years | 12 | Junior | 11 | Spring | 20 |
| | | 24 years | 0 | Senior | 16 | | |
| COVID-19 home confinement Spring 2020 living situation | | | | | | | |
| Living at home with family | | Campus housing | | | Off campus housing | | |
| 13 | | 12 | | | 26 | | |

Overall changes

Prior to progressing through the questionnaire, question 7 asked participants how their overall habits changed during the COVID-19 home confinement period. A majority of the responses ($n = 40$) suggested that participants either experienced various habit changes, such as overall food consumption, or did not experience change. Several of them stated their eating habits pre-COVID-19 to COVID-19 had no change ($n = 9$). Many of the other qualitative responses ranged on a scale of ‘unhealthy’ food consumption ($n = 3$) to ‘healthy’ food

consumption ($n = 5$). Participants also mentioned that they ate more during the confinement period ($n = 7$) due to boredom ($n = 1$) and not being in control of meal choices ($n = 1$). Few participants reported eating less ($n = 2$) to account for lack of exercise, in addition, to not eating out as frequently ($n = 1$). Finally, results indicated that some participants' eating patterns fluctuated ($n = 3$) by skipping meals during the COVID-19 home confinement period.

Macronutrients

The change in macronutrient consumption prior to and during the COVID-19 home confinement period are presented below in Table 2.

| | Carbohydrates | Protein | Fat | Fruits & Vegetables | Fluid |
|-----------|---------------|---------|-----|---------------------|-------|
| Increased | 20 | 12 | 14 | 14 | 20 |
| Decreased | 10 | 8 | 6 | 6 | 9 |
| No Change | 11 | 21 | 21 | 21 | 11 |
| Total | 41 | 41 | 41 | 41 | 40 |

Alterations in macronutrient consumption

Qualitative responses ($n = 38$) to the question regarding the reason for macronutrient consumption changes during the home confinement period were grouped into three categories: Socially-Based ($n = 12$), Biologically-Based ($n = 17$), and No Change ($n = 7$). Responses in the Socially-Based category mentioned that being home with family resulted in various changes to their diets. For example, while at home, participants ate food their parents purchased and cooked, and consumed foods that were readily available. Specific to one participant's experience, "I think my consumption of these food groups changed because I adopted the habits of others in my household". Participants in the Biologically-Based category experienced perceived negative diet alterations due to boredom, stress, and an overall increase in consumption. Whereas some of the participants mentioned perceived positive diet alterations, such as focused on changing eating

habits, became more aware of food choices, and consumed less. The third category, No Change, was comprised of responses that indicated that the COVID-19 home confinement period had no impact on their consumption of macronutrients.

Dietary Habits

SIU's fueling station is conveniently located in the Banterra Center where the athletes have their lifting sessions, locker rooms, and some have practice. Prior to the COVID-19 home confinement period, the fueling station was open Monday-Friday from 7:00 AM to 10:00 AM and 2:00 PM to 6:00 PM. During these hours, athletes had access to unlimited food that maximized their energy, performance, and recovery. Tables 3 through 8 below indicate responses about respondents' meal preparation and changes to food consumption.

| Table 3. Frequency of Utilizing Fueling Station | | |
|--|------------|----------------------|
| | Raw Number | Percentage of Sample |
| Approximately once a day | 5 | 13% |
| Approximately one to four times a week | 13 | 34% |
| Did not utilize | 11 | 29% |
| Was not a collegiate athlete | 5 | 13% |
| N/A | 4 | 11% |
| Total | 38 | 100% |

| Table 4. Meal Preparation Descriptive | | |
|---|------------|----------------------|
| | Raw Number | Percentage of Sample |
| Increased consumption of fast food & take out | 12 | 31.6% |
| Cooked more meals at home | 4 | 10.5% |
| No change | 12 | 31.6% |
| Other | 7 | 18.4% |
| N/A | 3 | 7.9% |
| Total | 38 | 100% |

| Before COVID-19 home confinement period | | During COVID-19 home confinement period | | Net change | | |
|---|----|---|----|------------|------------|----------------------|
| Myself | 31 | Myself | 24 | | Raw Number | Percentage of Sample |
| Parents | 9 | Parents | 13 | Myself | 7 | 0.17% |
| Other | 1 | Other | 4 | Parents | 4 | 0.10% |
| Total | 41 | Total | 41 | Other | 3 | 0.07% |

| | Raw Number | Percentage of Sample |
|-----------------|------------|----------------------|
| More consistent | 6 | 15.38% |
| Ate less | 7 | 17.95% |
| Ate more | 10 | 25.64% |
| Skipped meals | 6 | 15.38% |
| No change | 7 | 17.95% |
| Other | 2 | 5.13% |
| Total | 39 | 100% |

| | |
|-----------------------|----|
| Sweets | 5 |
| Fast food | 1 |
| Carbohydrates | 4 |
| Snacks | 4 |
| Protein | 7 |
| Fruits and vegetables | 9 |
| Alcohol | 1 |
| No change | 6 |
| N/A | 2 |
| Total | 39 |

| | |
|-----------------------|----|
| Fruits and vegetables | 8 |
| Carbohydrates | 7 |
| Protein | 3 |
| Water | 2 |
| Fast food | 3 |
| Fatty foods | 2 |
| No change | 10 |

| | |
|-------|----|
| Other | 2 |
| Total | 37 |

General Health

The lifestyle changes experienced by participating athletes during the Spring 2020 COVID-19 home confinement period is presented in Table 9.

| | |
|-------------------------|----|
| Focused on health | 9 |
| Exercise (more/less) | 8 |
| Less social interaction | 4 |
| Lazier | 7 |
| No change | 3 |
| Other | 8 |
| Total | 40 |

New Habits Developed

Results related to participants new habits (good or bad) development during the home confinement period were not consistent across responses. The main categories included general health ($n = 35$), engaging online ($n = 4$), and no change/not productive ($n = 4$). Many participants mentioned numerous habits in each response resulting in varied numbers of total responses for each category.

The general health category included answers that could be perceived as good or bad habits depending on the individual. For example, some participants mentioned that the home confinement period allowed them to spend more time with family ($n = 1$), sleep more ($n = 3$) or less ($n = 2$), exercise more ($n = 11$), read ($n = 4$), drink ($n = 3$), focus on self-care ($n = 2$) and eating habits ($n = 8$), and become less social ($n = 1$). Specific examples of new habits that began include “I was able to have more family time so that was nice”, “I had a bad habit of staying up

super late and getting up super late”, and “being lazy and not as productive”. Participants who engaged online spent more time playing video games ($n = 2$), watching TV ($n = 1$), and on social media ($n = 1$). For example, “more TV”, “Tik Tok”, and “playing more video games”.

New Habits Stopped

As previously noted, results stated below could be perceived as cessation of good or bad habits depending on the individual’s beliefs. Categories for this question also include general health ($n = 28$), engaging online ($n = 1$), and no changes ($n = 10$). Responses in the general health category included going outside ($n = 2$), exercise ($n = 12$), eating habits ($n = 5$), sleep schedule ($n = 4$), procrastination ($n = 2$), human interactions ($n = 2$), and focusing on mental health ($n = 1$). Examples of participants’ responses included, “I stuck to a healthy workout schedule”, “Good habit stopped...I stopped doing my daily workout routine”, “I don’t really go out at all anymore”, and “social media consumption”. Tables 10 through 14 below indicate responses regarding changes to sleep schedule, hunger, physical activity participation, and weight.

| | |
|--------------------|----|
| 3-4 hours | 2 |
| 5-7 hours | 8 |
| 8-10 hours | 16 |
| More than 10 hours | 7 |
| Irregular | 5 |
| No change | 1 |
| Total | 39 |

| | Raw Number | Percentage of Sample |
|-----------|------------|----------------------|
| Increased | 12 | 31.6% |
| Decreased | 4 | 10.5% |
| Irregular | 3 | 7.9% |
| No change | 11 | 28.9% |
| N/A | 8 | 21.1% |
| Total | 38 | 100% |

| | Raw Number | Percentage of Sample |
|--------------------|------------|----------------------|
| Hungrier | 16 | 42.1% |
| Less hungry | 8 | 21.1% |
| No change | 10 | 26.3% |
| Ate due to boredom | 3 | 7.9% |
| N/A | 1 | 2.6% |
| Total | 38 | 100% |

| | Raw Number | Percentage of Sample |
|-----------------------|------------|----------------------|
| Increased | 14 | 36.8% |
| Decreased | 16 | 42.1% |
| More at home workouts | 3 | 7.9% |
| Irregular | 3 | 7.9% |
| No change | 2 | 5.3% |
| Total | 38 | 100% |

| | Raw Number | Percentage of Sample |
|---------------|------------|----------------------|
| Gained weight | 19 | 47.5% |
| Lost weight | 11 | 27.5% |
| No change | 10 | 25% |
| Total | 40 | 100% |

Nutrition Guidelines Provided

Coaches

Out of the 37 participants who responded to this question, almost half ($n=16$) stated that their coaches did not provide much, if any, information on nutrition guidelines during the COVID-19 home confinement period. For those that did receive nutrition guidelines, information was minimal and broad. For example, participants reported that their coaches told them to choose healthy foods, stay hydrated, and continue exercising ($n = 17$). In addition, responses included encouragement from coaches to stay on a routine ($n = 1$), eat breakfast ($n = 1$), and focus on

mental health ($n = 1$).

Strength and conditioning coaches

Participants who responded to this question indicated that nutrition guidelines from their strength and conditioning coaches were focused primarily on eating habits ($n = 16$) and exercise performance ($n = 8$). Information related to eating habits consisted of adhering to the FASTER guidelines, as well as food recommendations. The acronym FASTER stands for Fruits and vegetables, Always hydrate, Start with breakfast, Think lean protein, Eat often, and Recovery. It is utilized by the strength and conditioning coaches to educate athletes on the best dietary habits to optimize performance. Participants who received exercise performance guidelines from Strength and Conditioning coaches were encouraged to consume foods that would help build muscle mass, improve performance, and to continue exercising at home. Finally, a little less than half of the participants reported receiving no nutrition guidelines from the SIU strength and conditioning coaches ($n = 13$).

CHAPTER 4

DISCUSSION

The purpose of this research study was to determine how collegiate athlete's nutritional status and eating habits changed during the COVID-19 home confinement period in spring 2020. The results of this study indicate various changes to lifestyle habits of SIU athletes between pre- and during COVID-19 home confinement. Specific to dietary habits, many athletes reported increased consumption of take out, reliance on parents for food, increased feeling of hunger, and eating more. These results come as no surprise due to the unprecedented conditions, as well as the minimal nutrition guidelines the athletes received. Prior to COVID-19 the athletes received nutrition education primarily from the sports nutrition graduate assistant and the strength and conditioning coaches. As previously mentioned, the nutrition guidelines provided typically consisted of emphasizing the FASTER system and additional information that was deemed important, such as nutrition label reading, supplement education, vegetarian protein options, and vitamin and mineral education through Instagram posts and stories, handouts, and presentations. The home confinement period resulted in cessation of the nutrition education presentations and handouts, therefore, only allowing for education through Instagram and word-of-mouth.

Results from this study indicated that both sport coaches and strength and conditioning coaches only provided minimal guidance/information on the Academy of Nutrition and Dietetics nutrition guidelines or focused on exercise performance. Exercise performance is in regard to nutrition approaches that effect performance outcomes, such as, "easy meals that [are] good for building muscle mass", "protein before weights", or "to eat protein after we were done working out". Although some nutrition guidelines can be better than none, the best guidelines for the athletes during the confinement period would have been to promote nutritious food choices, such

as consuming the five basic food groups (i.e., protein, grains, fruits, vegetables, and dairy) and staying hydrated. Specific nutrition guidelines for exercise performance were not necessarily needed because most of the athletes reported reduced physical activity levels. Although nutrition is an important component to improving exercise performance, the need for exercise specific nutrition is reduced when one does not participate in physical activity. For example, “it is recommended that athletes consume 55-60% of their total energy from carbohydrates, 20-25% of their total energy from fat, and 12-15% of their total energy from protein” (Thompson, et al., 2017, p. 185, para. 6). Whereas individuals who are not participating in physical activity are recommended to consume 45-65% of total energy from carbohydrate, 20-35% of total energy from fat, and 10-35% of total energy from protein (Thompson, et al., 2017).

Although some athletes reported an increase in physical activity, it was assumed that most would experience a decrease given the unprecedented circumstances and potential lack of exercise equipment and availability. Of the 38 responses to this specific question, 16 of the athletes reported a decrease in physical activity due to limited resources. For example, one athlete reports “honestly, it was very minimal because I didn’t have equipment and every gym was shut down”. Many, if not all the athletes, utilized the Lingle weight room for all of their exercise sessions during a “normal” spring semester. Unfortunately, when the home confinement period began, the athletes were not allowed to exercise in the Lingle weight room. Nor did they receive exercise guidelines from their coaches due to limited resource availability. Fortunately for some athletes, they were able to participate in physical activity in other ways, such as utilizing home resources for workouts and exercising outside. Moreover, as a result of decreased physical activity, many of the athletes reported weight gain. Not only is weight gain a result of no available exercise resources during the confinement period, so is the reduction in exercise

hours. Specific to one athlete, “I went from having 6 hours of practice a day to about 2 hours of self-guided workouts each day”. Consequently, a reduction in physical activity hours, along with poor nutrition might have been the overarching cause of weight gain that most athletes experienced. This finding is consistent with findings from an injury related research study, which found that the athlete’s knee injury resulted in an increase of body mass index and body fat compared to non-injured peers (Myer, 2014). Injuries and the COVID-19 home confinement period are similar in that the athletes were exercising minimally, eating differently, and/or were not taking into account their reduced calories needs when becoming sedentary. During unprecedented times, athletes should not only receive nutrition guidelines from coaches and athletic performance staff, but also physical activity guidelines. Due to limited exercise resources, the guidelines do not need to be extravagant, rather the guidelines should focus on increasing the heart rate, such as going for a walk.

An irregular sleeping schedule can also be detrimental to exercise performance, as well as overall health. Irregular sleep schedules refer to fluctuating amounts of sleep each night or irregular bedtimes. According to one study, “sleep duration increased during lockdown, as did the time taken to get to sleep” (Facer-Childs, 2021, p. 1). Whereas other individuals might have experienced reduced amounts of sleep during the COVID-19 home confinement period. No matter the experience of increased or reduced sleep, athletes reported that their sleep schedules had become “irregular”. Many of the athletes reported irregular sleep schedules, such as increased or decreased number of hours or no change. Athletes who have a poor sleep schedule could increase their risk for injury or illness (Watson, 2017), which might consequently affect those athletes who reported a decrease in hours slept. For those that reported an increase in hours slept, they might have experienced improvements in their performance, such as improved

reaction time, accuracy, and endurance (Watson, 2017). Although there is no surprise that the athletes reported irregular sleep schedules, education regarding how to acquire a regular sleep schedule following the confinement period should have been provided, such as recommended hours of sleep and how to promote a healthy sleep routine.

CHAPTER 5

SUMMARY

Limitations

Several limitations of the present research study should be considered. First, only one university, Southern Illinois University-Carbondale, was utilized to complete this study. While outlining the research project, it was deemed not feasible to involve athletes of other universities due to time constraints and access to other student athletes, thus we should use caution in generalizing these results to all student-athletes. Second, it was not accounted for whether the participants were attending the university during the COVID-19 home confinement period. Upon analyzing the data, it was determined that some of the athletes were still in high school or at a community college at the time of the confinement period. Therefore, potentially altering our results because they could not provide examples of what the SIU athletic department was like prior to the confinement period. Lastly, the COVID-19 phase during the home confinement period was not considered. More specifically, a comparison of Illinois's regulations compared to other states was not done. This could have altered results of the study because some of the athletes might not have been as restricted in their activities as were athletes in Illinois. For example, the COVID-19 home confinement period resulted in Illinois being in what was termed Phase one, which required remote working and learning, only essential stores to be open, bars and restaurants only open for delivery or curbside pickup, and closure of entertainment and personal care services. Whereas other state's regulations might not have been so strict; therefore, athletes living in those areas might have had access to a gym or exercise equipment that would help them avoid being sedentary.

Implications of Research Findings/Future Recommendations

Future implications of the present research study consist of providing athletes with basic nutrition information whether they are on or off campus. The most efficient way to do this would be to provide athletes with a nutrition booklet that outlines general nutrition information and nutrition for exercise performance. That way, no matter the situation, the athletes would have access to nutrition information. A booklet should also be made regarding exercises that can be completed at home so that athletes can still participate in physical activity. Finally, to ensure that this information is being presented to athletes, it is important that the coaching staff understand what is expected of them and how to access this information for their athletes. In addition, all nutrition-related questions should be directed to the sports nutrition graduate assistant.

The results of this study indicate that various changes to lifestyle, eating, and general health habits of SIU athletes did occur between pre- and during COVID-19 home confinement during March through May of 2020. Results suggest that athletes experienced eating and physical activity behavior changes similar to those that may occur when facing injury (i.e., significant life-changing events may lead to similar changes). Therefore, while the COVID-19 pandemic is hopefully an anomaly for most athletes moving forward, there are lessons that can be learned from this experience and serves to broaden our understanding of how traumatic events can impact collegiate student-athletes in particular.

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APPENDICES

APPENDIX A

Consent Form

My name is Megan Hammel. I am a graduate student at Southern Illinois University-Carbondale, and I am asking you to participate in my research study. Please read this consent agreement carefully before you decide to agree to participate in the study.

Purpose of the research study: The purpose of the study is to determine the potential changes in eating habits of Southern Illinois University-Carbondale athletes during the COVID-19 home confinement period (March-May 2020). The results of this study will be utilized in a research paper required by the Kinesiology department.

What you will do in the study: Participants will complete a survey outlining their living situation, dietary habits, and lifestyle habits during the Spring 2020 COVID-19 home confinement period. If any of the survey questions makes you feel uncomfortable, please feel free to skip that question(s) and/or stop the survey.

Time required: The study will require about 15 minutes of your time.

Risks: There are no anticipated risks in this study.

Benefits: There are no direct benefits to you for participating in this research study.

Confidentiality: The information that you give in this study will be handled confidentially. You will not provide your name during any point in the questionnaire. Your data will be anonymous which means that your name will not be collected or linked to the data.

Voluntary participation: Your participation in the study is completely voluntary.

Right to withdraw from the study: You have the right to withdraw from the study at any time without penalty.

How to withdraw from the study: If you want to withdraw from the study, simply exit out of the web browser. There is no penalty for withdrawing.

Payment: You will receive no payment for participating in the study.

If you have any questions about the study, please contact me or my advisor:

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APPENDIX B

Questionnaire

Personal Data

1. Sex: Male Female
2. Age: 18 19 20 21 22 23 24
3. Academic year: Freshman Sophomore Junior Senior
4. Normal competitive season: Fall Winter Spring
5. Circle the option that best describes your living situation during COVID-19 home confinement period during Spring 2020 (March – May).

Living at home with family Campus housing Off campus housing

Other: _____

Dietary Habits Changes

During the COVID-19 home confinement period...

1. How did your eating habits change?

During the COVID-19 home confinement period, the way you ate might have changed multiple times, therefore,

2. How did your consumption of carbohydrates (sweets, pastries, pasta, bread, etc.) change?

Circle: Increased Decreased No change

3. How did your consumption of protein (poultry, beans, meat, seafood, etc.) change?

Circle: Increased Decreased No change

4. How did your consumption of fat (oil, butter, margarine, etc.) change?

Circle: Increased Decreased No change

5. How did your consumption of fruits and vegetables change?

Circle: Increased Decreased No change

6. After answering questions 2 – 5, why do you think your consumption changed or stayed the same of these food groups?

7. How did your fluid intake (water, carbonated beverages, alcohol, etc.) change?

8. How did your consumption of dairy products (cheese, yogurt, milk, ice cream, etc.) change?

Circle: Increased Decreased No change

9. How often did you eat at the fueling station prior to the COVID-19 home confinement period (once a day, twice, three times a week, etc.)?

10. How did preparing your meals change (cooking, take out, fast food, etc.)? For example, a lot of athletes got their food from the fueling station, how did closure of the fueling station change your meal preparation?

11. Meal preparation:

a. Who prepared your meals and snacks?

Circle: Myself Parents Other: _____

b. Who prepared your meals and snacks before the home confinement period?

Circle: Myself Parents Other: _____

12. How did your schedule of eating meals/snacks change (number and frequency of meals)?

13. What foods did you consume MORE of than before COVID-19?

14. What foods did you consume LESS of than before COVID-19?

Lifestyle Habits Changes

1. During this period, how did your lifestyle change?

2. Habits

a. During this period, what new habits (good or bad) began?

b. During this period, what new habits (good or bad) stopped?

3. Sleep

a. During this period, how many hours did you sleep a day?

- b. How did your hours of sleep/schedule change from before the confinement period?

4. During this period, how did your sense of hunger change?

5. During this period, how did your training/physical activity change?

6. During this period, how did your weight change?

Circle: Gained weight Lost weight No change

7. Nutrition Guidelines

- a. During this period, what instructions did you receive from your COACHES about nutrition?

- b. During this period, what instructions did you receive from your STRENGTH AND CONDITIONING COACHES about nutrition?

8. Is there any additional information you would like to add? If so, please explain.

VITA

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Research Paper Title:

An Exploration of COVID-19 and Dietary Patterns in Collegiate Athletes

Major Professor: Dr. Julie Partridge