

Assessing Body Composition and Diet Quality Changes in a Cohort of NCAA Division 1 Female Swimmers & Divers Following a Nutrition Intervention

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Abstract

Research has shown a lack of nutrition knowledge among collegiate student-athletes. This lack of knowledge can potentially lead to a nutrient - deficient diet and poor athletic performance. Twenty-five NCAA female swimmers and divers were analyzed to assess the effectiveness of nutrition education on diet quality and body composition. Throughout the season, the athletes participated in nutrition education and cooking demonstrations, and diet quality was measured. Evaluation of body composition was conducted using tetrapolar bioelectrical impedance analysis (BIA): SECA mBCA 515. The biomarkers of interest were skeletal muscle mass, phase angle, total body water, total energy intake, fruit and vegetable consumption, and the intake of saturated fats. An analysis and comparison of these variables can provide valuable information as to how coaches and instructors can use nutrition education to improve eating behaviors and athletic performance in collegiate student-athletes.

Introduction

We observed and analyzed the relationship between nutrition education, diet quality, and muscle mass gain in Swim and Dive student-athletes. With limited nutrition knowledge, micronutrient deficiencies, inadequate water intake, and insufficient calorie intake can occur. These types of health challenges often have detrimental effects on athletic performance. Nutrition education interventions are important for addressing problematic dietary practices that athletes may follow.

Inadequate intake of energy coupled with an intake of less micronutrients may not only increase disease risk but can also impact athletic performance and recovery. A detailed and easy-to-follow dietary plan is important in achieving optimal athletic performance (Spriet, 2019). Nutrition education interventions with instruction and cooking demonstrations may improve overall energy intake as well as the consumption of nutrient-dense foods.

Methods

Participants:

- 25 NCAA Division 1 Swimmers & Divers
- Mean age: 19 years \pm 1.32
- 90.3% Caucasian, 9.7% Other

Procedures:

- Student-athletes were tested during the pre-season and post-season.
- Testing included a 24-hour diet recall assessment, as well as a body composition assessment.
- Pre-testing occurred on week 0, 45-minute nutrition education sessions occurred weeks 3 and 7, and post-testing occurred on week 20.

Data Collection:

- Dietary intake was assessed using the Automated Self-Administered 24-Hour Diet Recall (ASA-24)
- Body composition was evaluated using tetrapolar bioelectrical impedance analysis (BIA): SECA mBCA 515

Results

Figure 1: shows the baseline and final values for average energy intake. Energy intake decreased by an average of 500 calories.

Figure 2: shows the baseline and post values for average skeletal muscle mass. Skeletal muscle mass increased by an average of 0.20 pounds.

Figure 1 (KCAL)

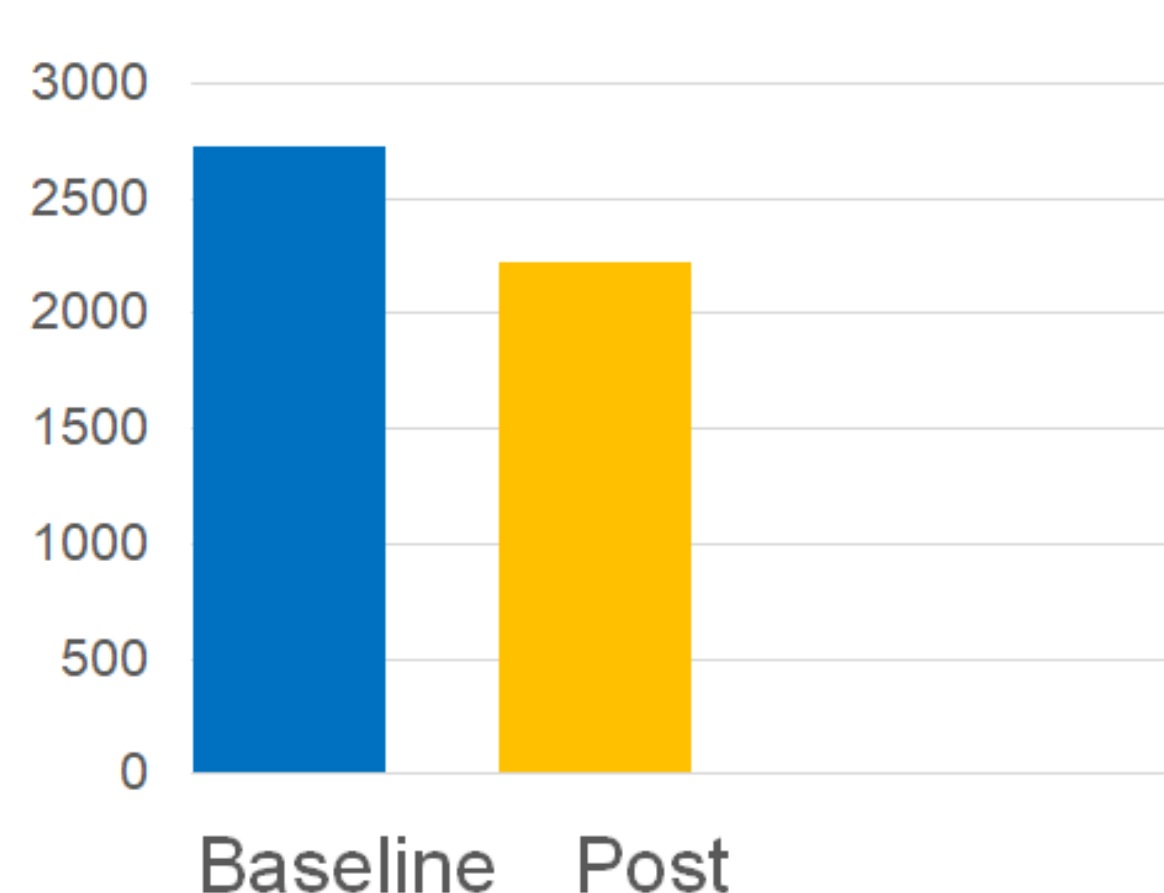
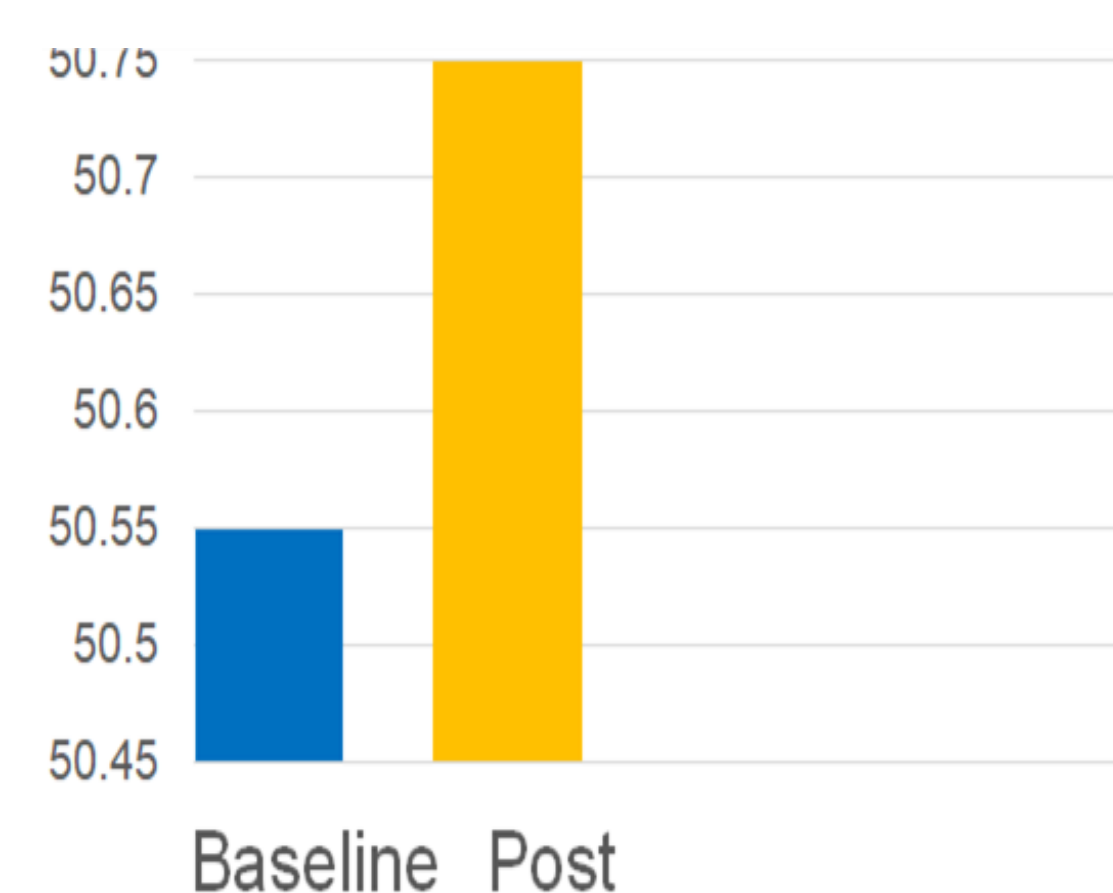


Figure 2 (muscle mass - lbs.)



Results - continued

Figure 3: shows the baseline and post values for average vegetable and fruit intake. Vegetable and fruit intake decreased by an average of 0.50 and 0.80 servings respectively.

Figure 4: shows the baseline and post values for average saturated fat intake. Saturated fat intake decreased by an average of 8.02 grams.

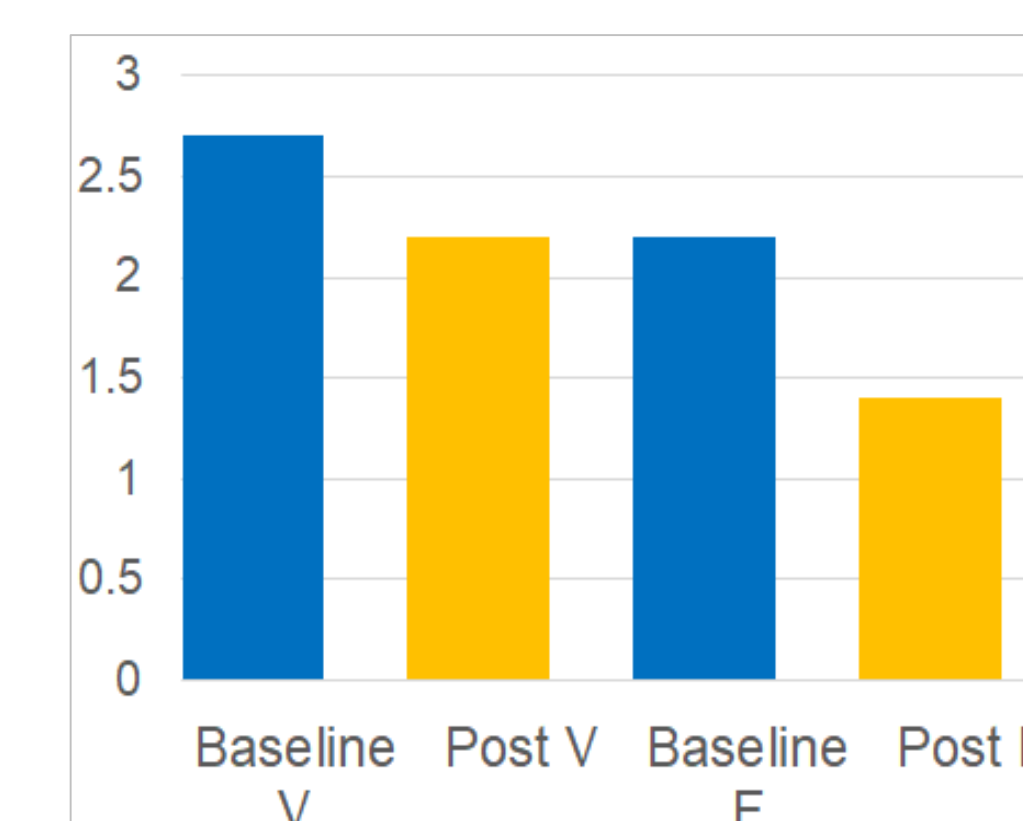


Figure 3 – (servings VF)

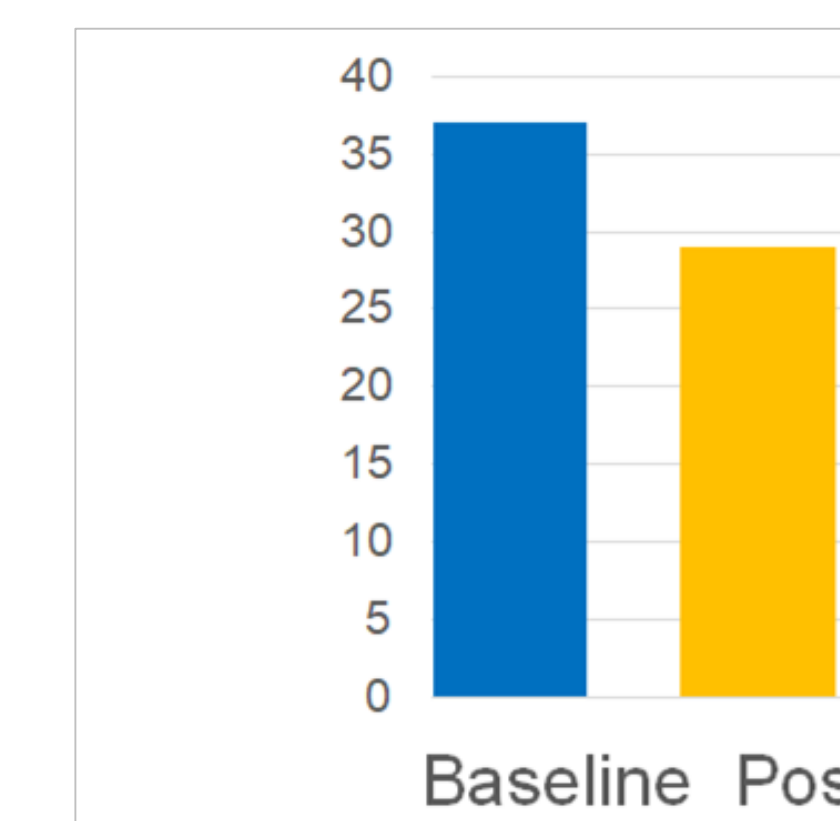


Figure 4 – (g sfat)

Discussion & Conclusion

We hypothesized that as the student-athletes received more nutrition education, their diet quality would improve, thus leading to quicker recovery and more muscle gain. Our markers show that diet quality didn't necessarily improve and there was only minimal muscle mass gain. Confounding variables likely influenced dietary choices as well as muscle gain outcomes. Future studies may be more effective if better performance markers and dietary parameters were set during the trial period. Dietary recalls only included a snapshot of information and may not be truly representative of an athlete's regular overall dietary intake. Further research will help us better understand the relationship between nutrition education, diet quality, and athletic performance in collegiate student-athletes.

References

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