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NORTHERN ILLINOIS UNIVERSITY

Comparison of supplement use between athletes and non-athletes at a Midwestern
University

**A Capstone Project Submitted to the University Honors Program In Partial Fulfillment of
the Requirements of the Baccalaureate Degree With Upper Division Honors**

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Comparison of supplement use between athletes and non-athletes at a Midwestern University

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Date of Approval: 5.04.2017

ABSTRACT

This study examines examines dietary supplement use of collegiate athletes at a Midwestern university. Data was collected from both athletes and non-athletes in order to see how similar or different collegiate athletes' supplement use may be. Data was collected via a ten question in-person survey, which took into account different factors of each student, such as: age, major, dietary and physical activity behavior, source of knowledge, and intended use of supplement. The purpose was to examine trends between nutrition supplement use and the college students who use them. The study found that there were not only several differences in supplement choices between athletes at this university versus collegiate athletes in previous studies, but also between this university's athletes and non-athletes. Additionally, this study found a possible correlation between active college students and healthy eating habits.

INTRODUCTION

Athletes around the world use various dietary supplements for various reasons. Some use supplements for nutritional benefits and overall health, while others may use supplements for strength, speed or agility. Regardless of the reason, the amount of dietary supplements offered over the counter is increasing rapidly. In addition, there are several factors that play into which athletes use which supplements. Availability varies greatly depending on location. Certain supplement use also varies based on the sport. Supplement use amongst collegiate athletes is popular. According to several studies done in the last two decades, on average, 80-90% of Division I collegiate athletes use at least one kind of dietary supplement in order to increase athletic performance.¹⁻⁴ In addition, most collegiate athletes tend to use similar dietary supplements. A study examining eight Division I universities found that vitamins/minerals (73%), calorie replacement drinks (47%) and protein (40%) were the most commonly used supplements among athletes.¹ Another study found that 80% of students who utilized supplements named energy drinks as their main source of supplementation.² Creatine is also a popular supplement used by college athletes. In a study focused specifically on creatine use in Division I athletes, 40% of students who used supplements reported using creatine.⁵ However, there have been very few studies done to follow up on current supplement use in collegiate athletes. In the years since these studies have been published, the NCAA (National Collegiate Athletic Association) has implemented stricter rules on which supplements student athletes may or may not use. In fact, year round drug testing was not implemented until 2006 (which is after the above mentioned studies were published). According to the NCAA's website, the following classes of drugs are banned: stimulants, anabolic agents, diuretics, street drugs, peptide hormones and analogues, anti-estrogens, and beta-2 antagonists.⁶ There are also certain classes of drugs

which hold restrictions. These include blood and/or gene doping, manipulation of urine samples, and local anesthetics. Furthermore, the NCAA mentions that certain supplements may contain small amounts, yet enough to test positive on a drug test, of banned substances.⁶ This brings up an interesting question: does the enforcement of banned drugs and stricter drug testing change which supplements athletes are using? Are vitamins/minerals, energy drinks, and protein still the most popular supplements among student athletes? And what role does creatine play in all of this? This study focuses on a Division I Midwestern University. Sixty six (66) students (both athletes and non-athletes) were surveyed about their supplement use. This study demonstrates whether or not student athletes are still using similar dietary supplements as a decade ago.

METHODS

Survey Development

The survey was approved by the university's Institutional Review Board. It was broken down into five sections: (a) student background information: age, gender, ethnicity, major, and year in school; (b) athlete vs. non-athlete; (c) level of physical activity; (d) supplement use; (e) healthy eating patterns. One survey was created for both athletes and non-athletes in order to compare any similarities or differences between the two groups. On average, each student completed the survey in five to ten minutes. Each survey was taken in person. Each participant signed a consent form acknowledging their data would be used confidentially in this study. The surveys were distributed at several buildings on the university's campus to try and create a diverse sample size. However, it should be noted that a majority of surveys came from the university's campus recreation center.

Subjects

Sixty six surveys were completed and used in the data analysis and conclusions. Of the sixty six participants, twenty seven (41%) were athletes and thirty nine (59%) were non-athletes. All participants were between the age of eighteen to twenty two. The mean age of all participants was 20.02 years old. Of the sixty six participants, 33 (50%) were male and 33 (50%) were female. A significant portion of the population were either Caucasian or African American/Black, but there were participants of several ethnicities. More participants reported majoring in non-health majors than a health-related major. Figures 1-3 further depict the demographic characteristics of the participants.

	Age (yr)	Male	Female	Freshman	Sophomore	Junior	Senior
Athlete	19.96	15	12	1	10	11	5
Non-Athlete	20.05	18	21	6	8	9	16
Total	20.02	33 (50%)	33 (50%)	7 (10.6%)	18 (27.3%)	20 (30.3%)	21 (31.8%)

Figure 1: Comparison of Age, Gender, and Year in School

	White	Black/African American	Hispanic/Latino	Asian/Pacific Islander	Other
Athlete	13	10	1	1	2
Non-Athlete	12	15	5	3	4
Total	25 (38%)	25 (38%)	6 (9%)	4 (6)	6 (9%)

Figure 2: Comparison of Ethnicities

	Health Major	Non-Health Major
Athlete	8	19
Non-Athlete	14	25
Total	22 (33%)	44 (66%)

Figure 3: Comparison of Health vs. Non-Health Majors

RESULTS

Prevalence (Figure 4; Figure 5; Figure 6)

Out of the entire population, fifty students (76%) reported using at least one dietary supplement at least once a week. Of these fifty students, twenty-two (44%) were athletes, while twenty eight (56%) were non-athletes. Students were given examples of supplements, such as: creatine, vitamins/minerals, protein, weight-loss supplements, caffeine, and calorie-replacement drinks. However, students were encouraged to write down any supplements they used even if it did not fall into one of the above categories. Figures 4 and 5 compare the prevalence of supplement use between athletes and non-athletes. There was a noticeable difference in the

specific supplements athletes and non-athletes used. Athletes were more likely to use caffeine or calorie-replacement drinks while non-athletes were more likely to use creatine or vitamins/minerals. Both parties tended to favor protein. Creatine and vitamins/minerals were rarely reported from athletes. Only three athletes (11%) of athletes reported creatine use and only five athletes (18.5%) reported using vitamins. Overall, caffeine was the most popular supplement. Most participants used more than one supplement at a time. Along with prevalence of certain supplements, frequency of supplement use was also recorded. Nearly all students who used supplements used them frequently; forty seven (94%) reported consuming supplements at least once a week. Twenty four (48%) used a supplement at least once a day.

Figure 4: Number of participants who use supplements

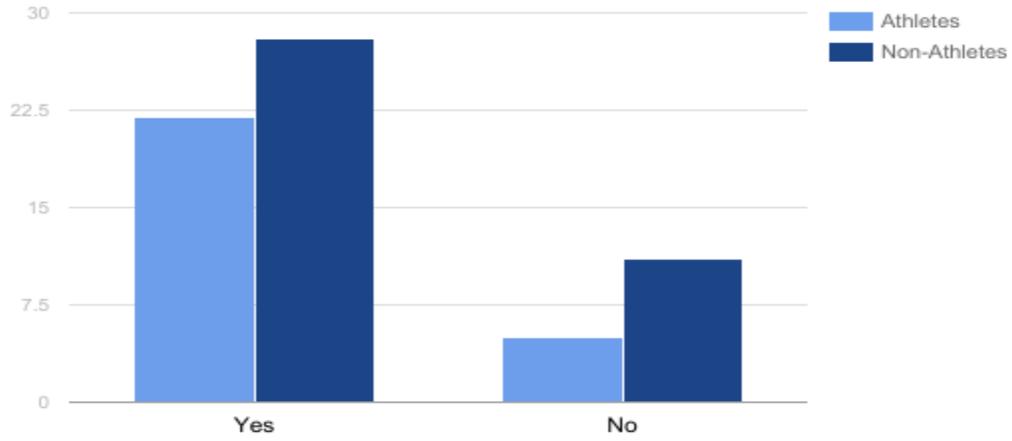


Figure 5: Comparison of Most Commonly Used Supplements

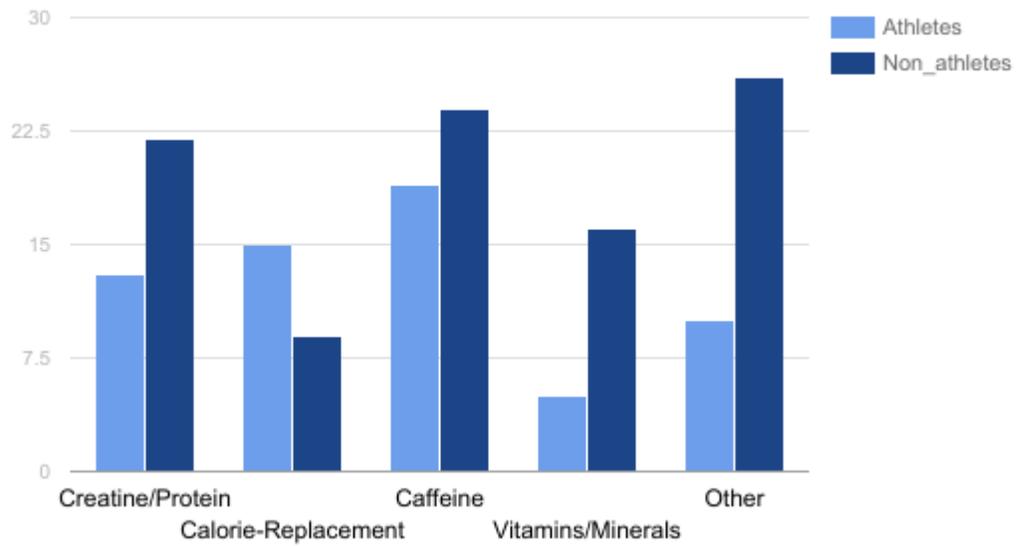
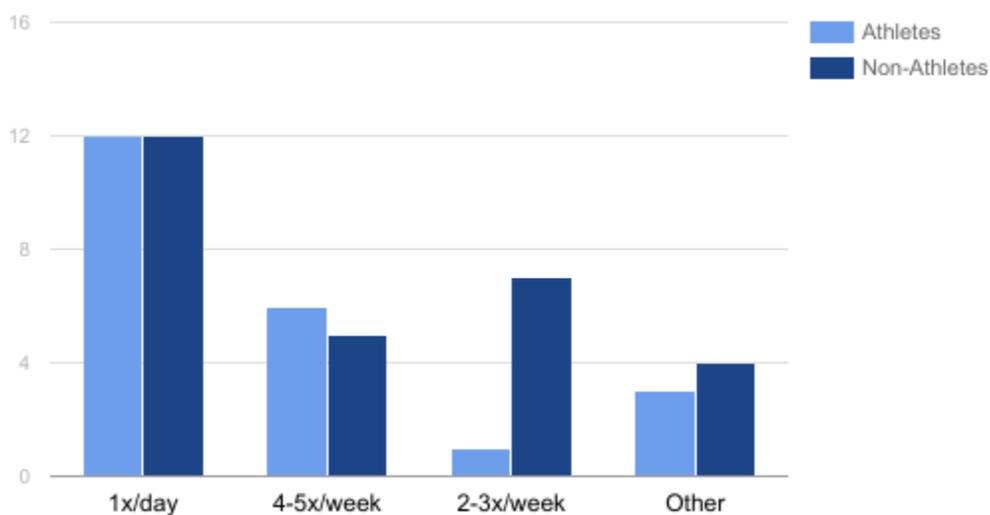


Figure 6: Supplement Frequency



Source of Information (Figure 7; Figure 8)

Each student reported one of the following four sources of information: health professional(s), coaches, websites, or friends. Overall, it seemed as though coaches were the most popular source of information (31%). However, when looking at athletes vs non-athletes, only athletes mentioned their coach being their source of information. Non-athletes were more likely to receive information from a website or a health professional.

Figure 7: Athletes' Source Of Information

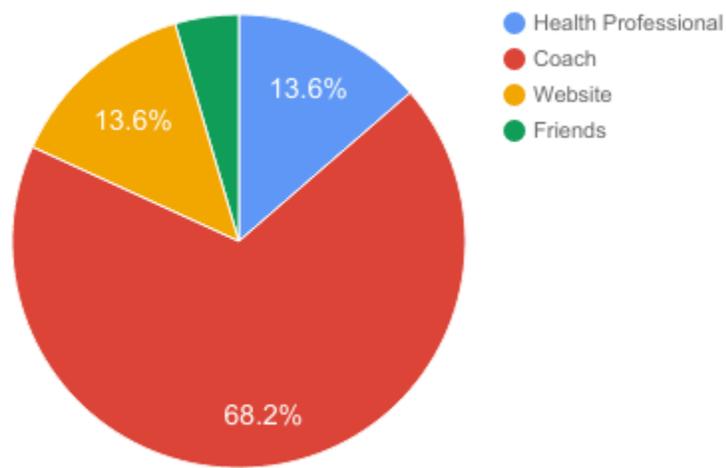
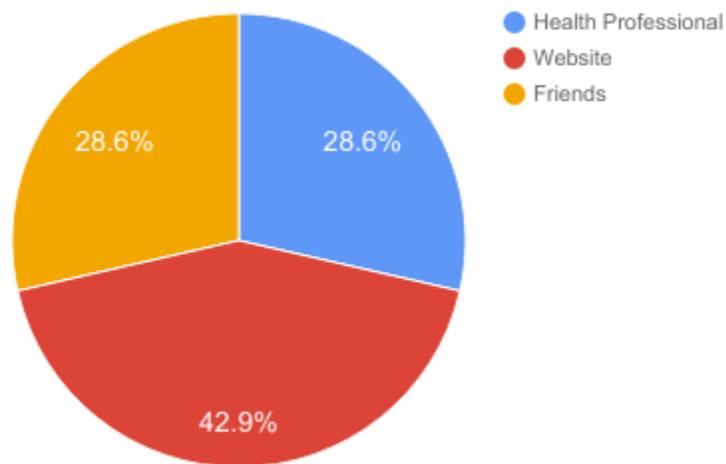
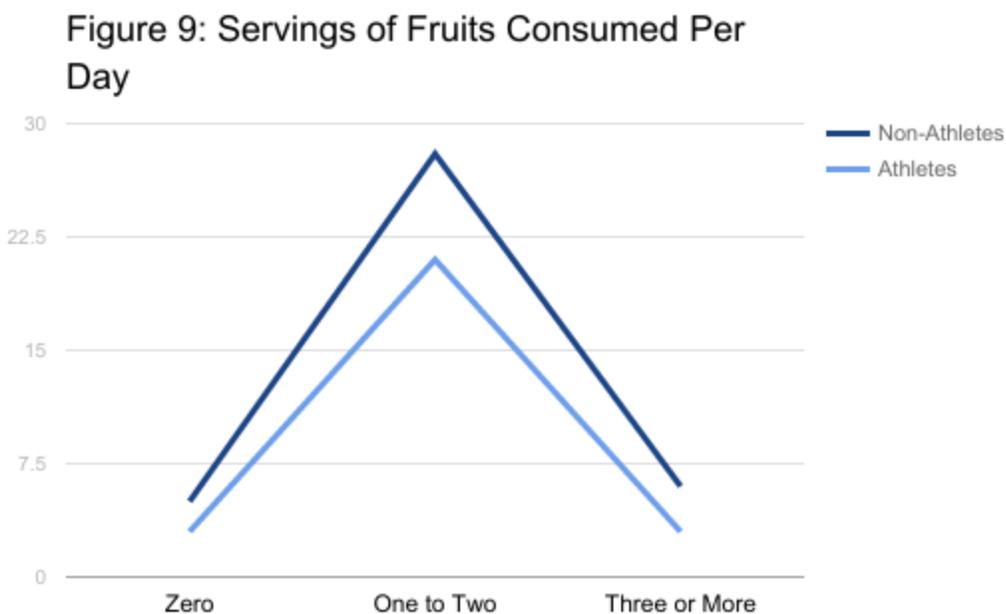


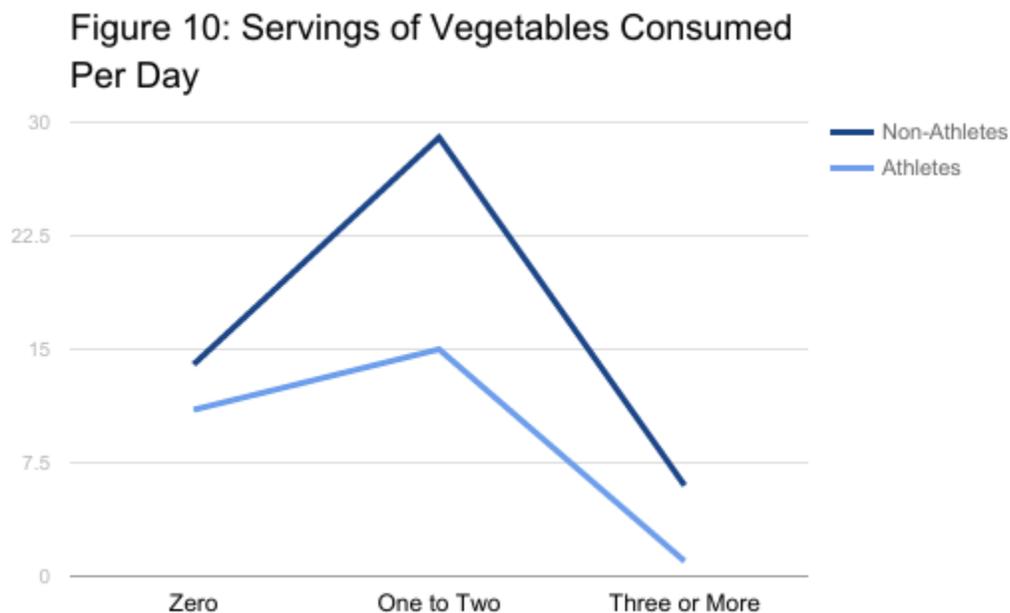
Figure 8: Non-Athletes' Source Of Information



Lifestyle (Figure 9; Figure 10)

In order to see if a healthy lifestyle was correlated with supplement use, participants were asked about how many servings of fruits and vegetables they consumed on average each day. Servings of fruits and vegetables were defined according to the United States Department of Agriculture's (USDA) and MyPlate standards.⁷ Athletes and non-athletes answers were similar. A majority of participants consumed one to two servings of fruits per day and zero or one servings of vegetables per day.





Non-athlete physical activity level (Figure 11)

Non-athletes were asked about their daily physical activity. Of the thirty nine non-athletes, thirty (77%) reported being active in some form. Level of activity (light, moderate, or vigorous) was fairly even. Twenty three of the active students (77%) were either involved in light or moderate activities. Nineteen of the active students (63%) were involved in some kind of physical activity at least five hours per week.

Figure 11: Amount of Active Non-Athletes

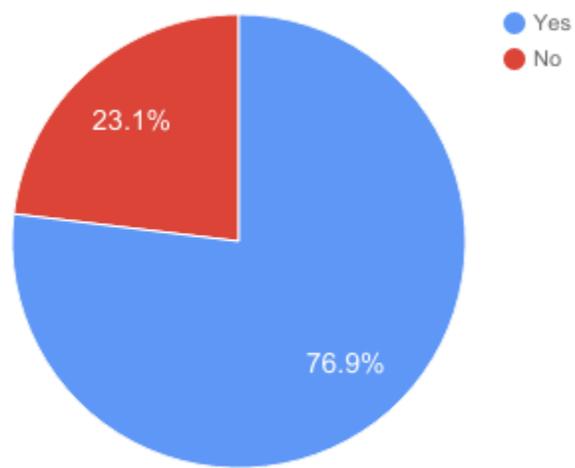
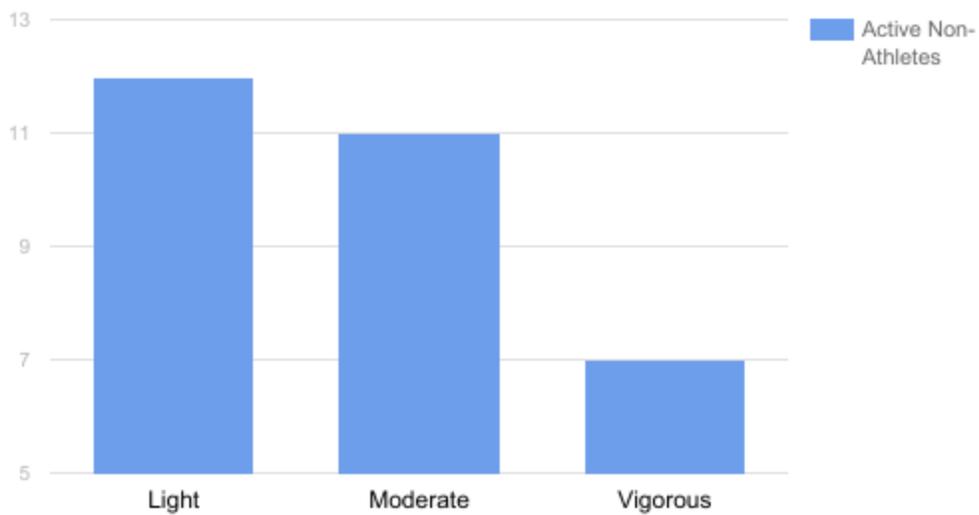


Figure 12: Level of Activity Among Active Non-Athletes



DISCUSSION

Although prevalence of dietary supplements among college students was high, it was not surprising. The percentage of participants who used supplements was within 5% of supplement use in previous studies.¹⁻⁴ Considering that the definition of dietary supplements was subject to the participants' view, the results of what was considered a supplement varied. Therefore, some participants may have had a wide range of what they consider supplements, while others may have only considered supplements to come in pill form. Because of this, supplements in this study were grouped into five groups (creatine/protein, vitamins/minerals, calorie-replacement, caffeine, and other) in order to create structure. It may be beneficial to define supplement in stricter terms for future studies.

What was surprising was the difference of supplement choices between athletes and non-athletes. Creatine was the most noticeable difference. Previous studies mentioned that creatine use was fairly high in athletes (averaging around 40%).⁵ In this university, only three athletes surveyed used creatine. The reasoning behind this may be the drug ban from the NCAA. While creatine itself is not listed on the NCAA's banned list, a significant amount of creatine brands have small amounts of certain properties that may provide a positive drug test.⁶ For this reason, most athletes decided it was not worth the risk and did not take creatine altogether. Of the three that did use creatine, it was mentioned that they spoke directly with coaching staff prior to buying specific brands. Two of the three athletes also mentioned that they spoke with other athletes from different universities (but in the same sport) to see what was considered safe. Another big difference between athletes and non-athletes was the use of vitamins and/or minerals. Non-athletes were more likely to take a multi-vitamin while athletes were hesitant, again, because of the possibility of it showing up positive on a drug test. In addition, athletes

were more likely to take a certain vitamin or mineral due to deficiencies or a reason that impacted their performance, while non-athletes were more likely to take a multi-vitamin because of their overall health. Lastly, the most popular supplement used by both athletes and non-athletes was caffeine. Forty four participants (88%) reported use of caffeine. Although a majority of athletes did use caffeine, they were more likely to consume less caffeine (2-3x/week) than non-athletes (1x/day). Stimulants are on the list of banned drugs of the NCAA; however, athletes are allowed to consume a certain amount of caffeine before it would test positive. This is probably correlated to why athletes consumed less caffeine than non-athletes.

Sources of information about dietary supplements were divided into four groups: health professional, coaches, websites, and friends. Overall, coaches were the most popular source of information. However, when looking at athletes vs. non-athletes, 100% of the participants that reported their coaches being their main source of information were athletes. Non-athletes were more likely to talk with a health professional, a website, or their friends. It is important to note that this specific university does not have a Registered Dietitian on staff for each sport. There is one Dietitian on staff for athletics, but she does not specifically speak with teams about their individual goals or needs. Therefore, athletes turn to coaches and/or athletic trainers in order to receive nutritional advice even if the staff do not have credentials to give nutrition advice. This can present problems, such as whether or not the advice is up to date with current nutrition information, and how this advice may impact an athlete's choice in supplements to safely enhance their performance. It may be wise to discuss hiring a full time Registered Dietitian for athletes at this university.

The biggest similarity between athletes and non-athletes was their lifestyle eating habits. All participants were asked how many servings of fruits and vegetables they ate on average per

day based off current MyPlate standards.⁷ The results between the two groups were almost identical. The majority of participants reported consuming one to two servings of fruit per day, and either zero or one serving of vegetables per day. Initially, it was thought that the athletes would consume more fruits and vegetables per day, but this data proves that that is not the case. This may be because of the high percentage of non-athletes who reported being active. From this data, it may be said that in general, students who are active have healthier eating habits. It should be noted that several of the surveys from non-athletes were taken at the university's campus recreation center. In the future, it may be beneficial to conduct more surveys outside of areas where students are presently being active to see if this correlation holds true. Even so, it is interesting to note the correlation between physical activity (even light activity) and eating more fruits and vegetables. It suggests that promoting physical activity might inadvertently promote healthier lifestyle habits and vice-versa.

CONCLUSION

Similarities between this university and previous studies regarding athletes include: prevalence of supplement use among collegiate athletes, variety of supplements used, source of information, popular use of energy and protein supplements, and purpose of supplement use. The biggest difference between this university and previous studies include the amount of athletes who use creatine or take vitamins/minerals (perhaps due to stricter NCAA drug rules). The comparison of athletes versus non-athletes cannot be considered a similarity or difference because of lack of studies using similar methods. However, the comparison of athletes and non-athletes brings about new correlations and suggestions between physical activity and consumption of fruits and vegetables.

In the future, it may prove useful to conduct surveys online to reduce any chance of bias or error in the collection of data. This also gives participants more time to think about their answers and provide more in-depth answers. Online surveys would also create more diversity in the participants and could potentially increase participation. Since a majority of non-athletes were active already, future studies should focus on collecting data from more non-active students to better determine the correlation of physical activity of consumption of fruits and vegetables.

Furthermore, since a majority of athletes at this university receive nutrition education and support from coaches, the university should invest money into hiring a full time Registered Dietitian specifically for these athletes. Having a qualified nutrition health professional might benefit students and guide their supplement use to produce greater results in performance.

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