

THE INTERSECTION OF ATHLETIC TRAINING AND NUTRITION
COUNSELLING IN REGARD TO DIETARY SUPPLEMENTS

by

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A THESIS

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This research investigates the intersection of athletic training and nutrition specifically regarding nutrition counselling and dietary supplementation. The study aims to explore potential gaps in the knowledge of clinicians for college athletics at all levels. A literature review was conducted and is accompanied by a survey of 626 athletic trainers from across the United States of America. The participants answered questions on a six-point Likert scale about their confidence and knowledge regarding nutrition and three different kinds of supplements. The results of the survey concluded that there was no significant gap in knowledge among athletic trainers among divisions, however, there was a strong desire for further training and knowledge regarding sports nutrition. This research demonstrates the need for more education provided to athletic trainers who care for college athletes at all three divisions. Further, this thesis suggests that athletic trainers are highly connected to an athlete's overall well-being, and having a well-rounded educational background will help them to give athletes the best care possible.

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Table of Contents

List of Figures and Tables	5
Introduction	6
Literature Review	10
Athletic Training	10
Nutrition	10
Relative Energy Deficiency in Sport	11
Dietary Supplements	12
Creatine Supplementation	13
Vitamin D Supplementation	14
Protein Supplementation	15
Methods	17
Results	21
Discussion	36
Introduction	36
Hypothesis 1	36
Hypothesis 2	37
Hypothesis 3	38
Creatine	38
Protein	38
Vitamin D	39
Hypothesis 4	40
Summary	41
Conclusion	43
Appendix A	45
Appendix B	62
Bibliography	63

List of Figures and Tables

Table 1: Alphabetical List of Sports Reported in Survey	21
Figure 1: Percentage of Athletic Trainers by division whose school has a designated dietitian/nutritionist on staff.	22
Figure 2: Percentage of Athletic Trainers by division whose primary sport has a designated dietitian/nutritionist on staff.	23
Figure 3: Confidence level of ability to counsel athletes about taking nutritional supplements by division.	24
Figure 4: Confidence level of ability to counsel athletes about their basic nutritional needs by division.	25
Figure 5: Confidence level of ability to recognize nutritional deficiencies in athletes worked with by division.	26
Figure 6: Level of understanding for why and when an athlete may take protein supplements by division.	27
Figure 7: Level of understanding of the risks associated with protein supplements by division.	28
Figure 8: Level of understanding for the reasons an athlete may take creatine supplements by division.	29
Figure 9: Level of understanding of the risks associated with creatine supplementation by division.	30
Figure 10: Level of understanding for the reasons an athlete might take Vitamin D supplements by division.	31
Figure 11: Level of understanding for the risks associated with Vitamin D supplementation by division.	32
Figure 12: Statement of confidence on courses included about sports/performance nutrition in graduate education that have been useful in a career setting by division.	33
Figure 13: Statement of confidence in graduate education preparedness on sports/performance nutrition in a career setting by division.	34
Figure 14: Statement of agreeance desire to continue education on nutrition and performance if given institutional support by division.	35

Introduction

Nutrition counselling is increasingly a critical component of athletic training in collegiate sports settings, with athletic trainers assuming progressively diverse roles beyond the traditional role in injury prevention and treatment. Athletic trainers serve as frontline healthcare professionals and are responsible for the holistic well-being of student-athletes. In addition to their primary duties, athletic trainers may need to address nutritional concerns, provide guidance on nutrition habits, and navigate the increasingly complex landscape of dietary supplementation.

The intersection of nutritional counselling and athletic training presents many opportunities but also challenges. The importance of proper nutrition in optimal athletic performance is established nationally. However, some programs in the National Collegiate Athletic Association (NCAA) lack a dedicated nutritionist or dietitian, placing additional responsibilities onto athletic trainers. Despite this, athletic trainers may face limitations in knowledge and training in relation to nutrition counselling. Additionally, the capacity and expectations for athletic trainers does not reflect the compensation they receive for their work. This could potentially impact the care that the student athlete receives, as diet is a primary factor in wellness, as well as rehabilitation. There are also funding limitations to consider, depending on the sport and the institution. Title-IX aims at eliminating funding differences between genders, however the size and successfulness of a sport will still impact donor funding.

To study the impacts these funding limitations, this research will compile data from many different sports and across divisions, aiming at providing a comprehensive understanding of differences in the availability of nutrition counselling. This thesis will explore how athletic trainers navigate their role in nutrition counselling, and how a base level education in nutrition could enhance care given to student athletes. It will examine current practices and perceptions

surrounding nutrition counselling—specifically regarding dietary supplements—within NCAA programs. General funding between programs should be considered as funding will change the way nutrition counselling will be perceived among athletic trainers. This thesis intends to understand the knowledge and training given to athletic trainers, with the aim of enhancing the nutritional support system for student-athletes.

Additionally, this thesis will examine three supplements in particular: creatine, protein and Vitamin D. Selected for their prevalence and popularity among NCAA athletes, creatine, protein, and Vitamin D are all essential nutrients that are supplemented for a variety of reasons at a collegiate athletic exercise level. Each supplement falls under a different category of supplements. Creatine falls under alpha amino acids and derivatives supplementation, protein falls under dietary supplementation, and Vitamin D is a hormone supplement. These supplements also have the most research that has been performed on their safety and potential side effects, though it should be noted that many other dietary supplements have been studied in recent years, and there is much room for further research in this category.

To accomplish this, a literature review and survey analysis will be performed, and the research will provide a comprehensive understanding of the background knowledge about nutrition among NCAA athletic trainers, which will be one of the only studies focusing on the athletic trainers, as opposed to the athletes. The combination of academic research and direct feedback from athletic trainers will provide a helpful tool in guiding future conversations about an athletic trainer's role in nutrition counselling in collegiate sports. These findings can help to facilitate the further development of support that will better serve the dietary needs of athletic trainers and thus, student athletes.

In programs where a nutritionist or dietitian is lacking, the burden of nutritional wellbeing falls on the athletic trainer, who without the additional responsibility of nutrition counselling, already has the job of being a front-line healthcare professional for a student athlete. However, even in programs where a dietitian is readily available, athletes still often turn to their athletic training team for guidance, implying the need for further education and training in performance nutrition.

The increasing popularity and prevalence of dietary supplements, including supplements such as creatine, Vitamin D, and protein, adds additional challenges and considerations for athletic trainers, especially in rehabilitation processes. And while supplements can and have been shown to give athletes health benefits and even a competitive edge, their lack of regulation and oversight adds concerns about safety and NCAA substance guideline compliance.

Further research with direct input from athletic trainers will help athletic training programs to understand the importance of nutrition education and training. Ensuring that athletic trainers have the knowledge to support the nutrition needs of student athletes will increase the level of care that can be provided to student athletes on and off the field.

Increasing the accessibility of nutritionists and dietitians within athletic programs will also help athletes to receive proper care. The requirements of an athletic trainer are vast and should be separate from the role of nutrition counsellor. However, the fact remains that they are still the healthcare provider that most athletes turn to in discussions of holistic wellbeing, so a base level knowledge and training about performance nutrition is essential for an athletic trainer to provide optimal care, especially when a nutritionist is not readily available. This is because an athletic trainer is often one of the most present healthcare professionals in a student athlete's life.

In summary, I hope that this research will serve as an elucidation of the need for the advancement of nutrition education and training within NCAA athletic training programs. With a focus on supplementation, this research will explore the role of athletic trainers in nutrition counselling. By bridging this gap in knowledge, the goal of this research is to create a future where student athletes can receive the best, most holistic care that they need to thrive on and off the field.

Research Question:

How do athletic trainers in college sports settings navigate their role in providing nutrition counselling to athletes, and how could further nutrition education help athletic trainers better support their athletes?

Hypotheses:

An athletic trainer, regardless of division, will not feel that they lack in knowledge about sports/performance nutrition.

Athletic trainers, regardless of division, will report not having sufficient preparation in their graduate education about nutrition and nutritional supplements such as creatine, protein, and Vitamin D.

Despite lack in preparation, they will have acquired knowledge about nutrition and nutritional supplements such as Vitamin D, creatine and protein throughout their careers, across all the divisions.

Across divisions, trainers will overwhelmingly desire more training and info about nutrition despite already having knowledge acquired outside their original graduate education and other sources.

Literature Review

Athletic Training

Athletic trainers are a fundamental part of college sports. Their job includes the prevention, diagnosis, and recovery of injuries, both acute and chronic.¹ While the name is similar, athletic trainers are not personal trainers, as they are skilled and licensed healthcare professionals. They do often work with an athlete's strength, but their job also encompasses medical ailments. An athletic trainer is often the first point of contact when it comes to athlete health, especially in a collegiate setting. Trainers are most often required to have a master's degree and must complete additional education to maintain their license.

Additionally, athletic trainers often take on roles that are beyond the scope of their job description, often acting as counsellors in fields like nutrition and mental health. For the purposes of this project, the focus will be on the role that an athletic trainer plays in nutrition counselling. However, it should be noted that the intersection of mental health counselling and athletic training is an important one that deserves further research.

Nutrition

Though research suggests lower-division schools are most likely to lack a nutritionist or a dietitian that is available to counsel the athletes on proper dietary needs, colleges at all levels may not have this service readily available.² Without a trained nutritionist to look to for advice, the athletic trainer must take on yet another responsibility for an athletes wellbeing. However, without proper knowledge the topic of nutrition can potentially be overlooked, as the duties and requirements of an athletic trainer are many in number.

Even with a nutritionist on staff, one study investigating the use of supplements and the role of athletic trainers and dietitians in nutrition counselling reported higher percentages of athletes turning to their athletic training staff (39.8%) than to their nutrition staff (14.4%). Not only was the percentage of athletes relying on athletic trainers nearly double that of nutritionists, a startling 23.5% of athletes were unsure of whether their school even had a nutritionist to turn to.³ One study of a NCAA D1 school that does have a full-time registered dietitian on staff reported 65% of students having inadequate knowledge of vitamin supplementation.⁴

Relative Energy Deficiency in Sport

Relative energy deficiency in sport (RED-S) can be described as an athlete's energy availability being lower than required for participation in their sport. RED-S was formerly known as the Female Athlete Triad, which is because RED-S is commonly linked to the menstrual cycle in female athletes. However, the understanding of low energy availability (LEA) has expanded to male athletes as well, and in 2018, the International Olympic Committee (IOC) released a consensus statement that redefined the Female Athlete Triad as RED-S, expanding the definition to fit all athletes, regardless of biological sex. The IOC specifically states that the impaired physiological functioning of RED-S “includes but is not limited to impairments of metabolic rate, menstrual function, bone health, immunity, protein synthesis and cardiovascular health.”⁵

RED-S is one complication in high-level collegiate athletes that demonstrates the importance that nutrition plays in the overall wellbeing in athletes. Having the education and knowledge to be able to identify RED-S in student athletes will help to prevent problems in the endocrine system, menstrual cycle, bone health, metabolic system, haematological function, growth patterns, cardiovascular system, gastrointestinal system, immunological system and

psychological health, all of which are closely linked to RED-S.⁵ While RED-S is not always necessarily caused by an eating disorder, nutrition is commonly involved with the cause of RED-S. RED-S has significant and negative performance consequences for student athletes, and puts them at a higher risk for all types of injury. Previous research has shown that only about 50% of multispecialty clinicians have the knowledge and background to accurately identify when an athlete has signs and symptoms of RED-S.⁵ Further education of the clinicians—not just athletic trainers—who support the student athletes is necessary to prevent performance and life altering disorders such as RED-S.

Dietary Supplements

About 64.1% of college athletes use some form of dietary supplements.⁶ Some of the most prevalent dietary supplements used by athletes are Vitamin D, creatine, and protein. Each of these supplements vary in their levels of research and regulation amongst high-level athletes. In general, a person should try and improve their diet before turning to dietary supplements. However, in the cases of high-intensity sport athletes, dietary changes still might not be enough to battle a high metabolism. An example of this is that for an in-season division 1 Football player, supplements might be necessary to combat the amount of activity that they are participating in. A common problem that athletes at such a level have is that it is extremely difficult for a person to eat enough to gain a healthy amount of weight (thus, making their sport safer for them) to beat the caloric deficit that they deal with from a single day of practice. It should be noted that gaining weight is not the only purpose of taking nutritional supplements but also maintaining muscle mass specifically. These kinds of cases are a prime reason for why an athlete may choose to supplement.

One problem with supplements is that they are not regulated or tested by the Food and Drug Administration (FDA), so taking dietary supplements could potentially expose a person to dangerous substances, or in the case of a NCAA athlete, banned substances. Despite the risk, nearly half of the student athletes in one study claimed to take supplements more than twice a week, with varying prevalence among most commonly used supplements based on sex, sport, age and academic year.⁷

Athletes choose to take supplements for numerous reasons, whether it be general health and wellbeing or to gain a competitive edge. One article uses the Theory of Planned Behaviour (TPB) to explain the possible psychological reasoning for student athletes habitual supplement usage. The TPB has four main principles: attitude towards the behaviour, subjective norms, perceived behavioural control, and behavioural intention. These constructs are centered around individual motivational factors as the determining factor of the likelihood of executing a specific behaviour.⁸ In this study, Dr. Housman studied female collegiate athlete's use of dietary supplements to create a psychological understanding of why an athlete may choose to take a supplement, when there have been many adverse side effects studied. The results concluded that the TBP can be used to predict behaviour regarding using supplements as a D1 collegiate athlete, which is important so one can understand the decision-making process an athlete may use when taking a potentially harmful substance.

Creatine Supplementation

One of the most popularly used supplements in athletics and exercise performance is creatine. Creatine monohydrate—the technical name—has been studied heavily since the 1990s, and has been shown to increase power, strength, and work performance, specifically regarding to quick, high intensity exercise.⁹ This type of exercise is specifically impacted with creatine

supplementation because it uses anaerobic respiration whose primary source of energy is phosphocreatine. When taken in the recommended doses, there have been few studies that have mentioned long-term adverse side-effects for taking creatine supplements.

Creatine use is highly regulated within the NCAA, and nutritionists are not allowed to give creatine to their athletes, however an athlete would not be banned if they tested positive for obvious creatine supplementation.¹⁰ Dietitians can recommend creatine supplementation to their student athletes, however, it is the responsibility of the student athlete to pursue the supplement. Regardless of who the student athlete turns to for nutrition counselling—athletic trainer or nutritionist—it is the responsibility of the athlete to act. Some athletes may readily accept and follow advice of their medical professional, but this is most definitely not an applicable statement for student athletes as a whole. Student athletes may turn to creatine supplementation to provide a competitive advantage against their opponents. While currently viewed as a “safe” dietary supplement, one study argues that there is not enough data to confidently declare that regular creatine supplementation has no long-term side effects.¹¹ However, further research has been done investigating potential side effects of creatine that should be examined before an athlete makes the decision to supplement with creatine. As further research with creatine is done, an athlete should turn to their nutritionist, or other healthcare provider, before making the decision to supplement with creatine.

Vitamin D Supplementation

Vitamin D supplements are taken by many athletes across the NCAA. Its use varies geographically, as Vitamin D is a hormone that is primarily obtained by sun exposure, though it should be noted that there are dietary and supplement ways of obtaining the Vitamin D. One study on the prevalence of low Vitamin D (LVD) in athletes reported that over 50% of studied

athletes presented with LVD. They mentioned a possible link between injury and LVD, though there is no data presented to solidify this connection. The study does, however, argue that using reliable and tested supplementation is “essential” for athletic performance.¹²

With this knowledge, Vitamin D is one supplement that can both give an athlete a competitive edge by increasing athletic performance and provide an athlete with an essential hormone that may be lacking due to climate patterns and geographical status, however, the data supporting this claim that Vitamin D gives a competitive edge is lacking in evidence.

Additionally, many observational studies have indicated that “muscle function; exercise recovery and adaptation; and occurrence of stress fracture, soft tissue injury, and illness are higher in athletes with LVD.”¹³ With that being said, there is still a lack of testing on whether Vitamin D dietary supplements can help reduce these associated ailments and side effects of LVD. In a survey sent out to NCAA D1 head athletic trainers it was found that only 20% of programs have regular protocol for LVD, and of those programs, only about 40% of them cover the cost of Vitamin D supplements. Without the athletic department’s backing, this puts the athlete responsible for funding their treatment for LVD.¹³ Some supplements are able to be funded by the athletic program (protein and electrolytes are very commonly covered by the athletic medicine department), however this again depends on how well a program is funded.

Protein Supplementation

Protein supplements are the most used supplement among NCAA athletes. The motivation for its use varies, though the primary reasoning given by one study is to improve health and increase strength and power.⁷ Studies have shown that protein supplements can be used for muscle growth (through stimulation of the growth hormone), strength, energy utilisation, and enhancement.¹⁴ However, the problem with protein supplements is that there is

not necessarily any true regulation on what goes into protein supplements. This means that if one is supplementing with protein, they need to pay attention to the labels on their specific protein powder (or other form of ingestion), to ensure that they are not ingesting any harmful minerals in addition to the amino acids they are looking for.

To combat the lack of FDA regulations, organisations have turned to the National Sanitation Federation (NSF), which is a non-profit that tests the safety and quality of supplements. They state:

In the last decade, the dietary and nutritional supplements industry has grown tremendously. The fact that these products do not receive the same regulation as prescription or over-the-counter drugs raises questions in the minds of many consumers. This is why NSF developed the nation's first independent testing standard and product certification program strictly for dietary supplements. The program protects consumers by testing for harmful levels of contaminants and certifying that supplements contain the ingredients listed on the label and nothing else.¹⁵

Dietitians in the NCAA utilise this safety standard before giving their athletes any kind of supplement. The NCAA themselves do not regulate which brand of supplements are or are not allowed, stating that student athletes are responsible for anything that they put in their bodies. They do however, test for banned steroids or stimulants, and if a student athlete does not properly research their supplement, they could be banned from participation due to testing positive for such a substance.¹⁶ If a school does not have a dietitian available to an athlete, the responsibility of ensuring that they are taking a safe and uncontaminated dietary supplements falls on the athlete. However, this raises questions on just how influential nutrition counselling is on student athletes if they are making so many decisions on supplementing.

Methods

This research focused on NCAA athletic trainers in all divisions. Each participant was sent an anonymous survey with basic, non-traceable information about the institution they work for. Emails were collected through online staff directories. The survey was approved by an institutional review board (IRB) for exemption under Title 45 CFR 46.104(d) ((2)(i) Tests, surveys, interviews, or observation (non-identifiable). A list of schools included in this research survey are included in Appendix A. A total of 5680 individuals were emailed and the response rate was 11%. This information included information about the sport they oversee, as well as the accessibility of a dietitian to that sport. The survey was sent via email as a Qualtrics link. The background information that was collected included the following.

- *“What division is your school apart of”*
- *“Does your school have a certified dietitian/nutritionist on staff?”*
- *“What sport(s) do you primarily oversee?”*
- *“Does the primary sport you work with have a designated dietitian/nutritionist?”*
- *“What athlete gender(s) do you primarily work with?”*
- *“What type of degree do you hold?”*
- *“How many years have you been an Athletic Trainer”*

Additionally, the survey included twelve questions that were rated on a 6-point Likert scale, which assessed the confidence of athletic trainers in the knowledge of supplementation and nutrition counselling. A six-point scale was used as that takes the ability to select neutral away from the participant, thus making the participant really think about which way they would more likely answer. The questions that were be included are as follows:

Please select how much you agree with the following statements:

“I am confident in my ability to counsel athletes about taking nutritional supplements.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I am confident in my ability to counsel athletes about their basic nutritional needs.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I am confident in my ability to recognise nutritional deficits in athletes I work with.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I have an in-depth understanding for why and when an athlete may take protein supplements.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I have an in-depth understanding of the risks associated with protein supplements.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I have an in-depth understanding for why and when an athlete may take creatine supplements.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I have an in-depth understanding of the risks associated with creatine supplements.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I have an in-depth understanding for why and when an athlete may take Vitamin D supplements.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“I have an in-depth understanding of the risks associated with Vitamin D supplements.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“My graduate education included courses on performance/sports nutrition that have been useful in my career setting.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“My graduate education prepared me to counsel athletes on performance/sports nutrition in a career setting.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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“If given institutional support, I would seek out continued education about nutrition and performance.”

Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
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The Likert Scale was used to quantitatively demonstrate confidence which is not directly a measurable variable. By applying numerical values to confidence (for example, the value of 1 being assigned to “strongly agree” and 6 being “strongly disagree”), a quantitative analysis can be run to demonstrate variability among questions. Using the Likert scale will allow the results to be compiled for statistical analysis using a Chi-square test with appropriate post-hoc tests. The results of the survey are also reviewed based on knowledge and information provided in a literature review.

The combination of the examination into nutrition counselling regarding supplementation and athletic training with a literature review will allow for a comprehensive analysis of educational background in nutrition given to athletic trainers at a NCAA level.

Results

Of the 5680 emails included for the survey that was sent out, 626 athletic trainers responded (11%). 58% of the participants came from a Division 1 university, 12% came from a Division 2 school, and the remaining 30% reported working at a Division 3 level. There were trainers ranging from six months of experience to fifty-six years with an average of 12.00 ± 10.26 years. 30% reported working only with male sports, 28% with only female sports and 42% of trainers reported working with all genders. The following sports were reported as being covered by at least one participant in the survey:

Acrobatics and Tumbling	Baseball	Basketball
Beach Volleyball	Cheer	Cross Country
Dance	Dive	Equestrian
Fencing	Field Hockey	Football*
Golf	Gymnastic	Ice Hockey
Indoor Volleyball	Lacrosse	Nordic Skiing
Rifle	Rowing	Rugby
Sailing	Skiing	Soccer
Softball	Stunt	Swim
Tennis	Track and Field	Triathlon
Water Polo	Wrestling	

Table 1: Alphabetical List of Sports Reported in Survey

*Indicates the most frequently covered sport.

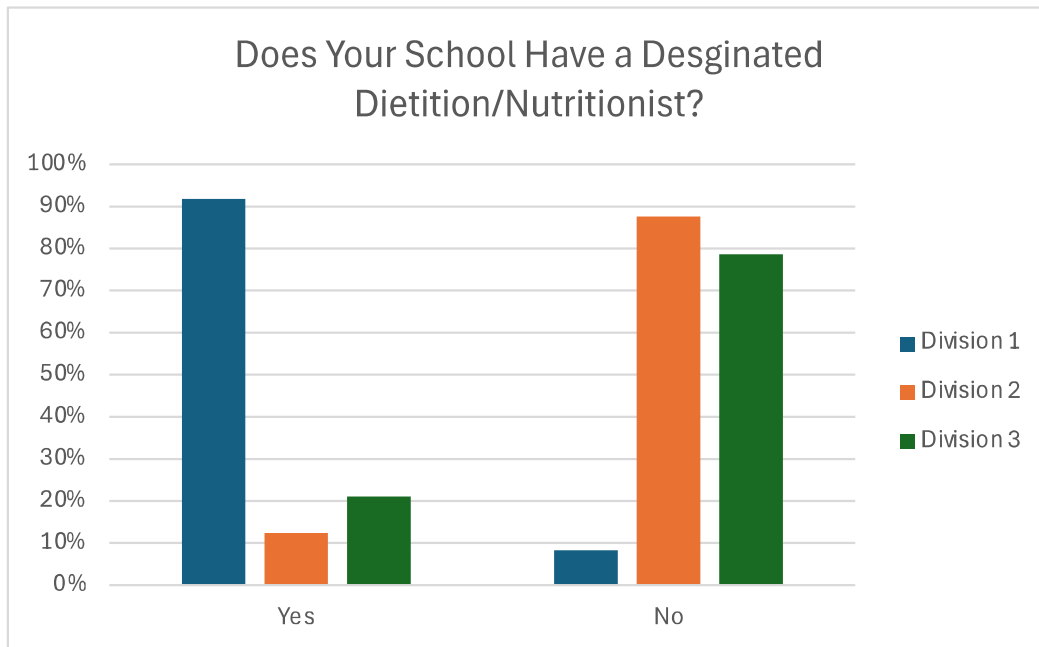


Figure 1: Percentage of Athletic Trainers by division whose school has a designated dietitian/nutritionist on staff.

Chi Squared = 273.78. P-Value = 0. Degrees of Freedom (DOF) = 2.

Figure one represents the percentage of athletic trainers who have a dietitian or a nutritionist for their schools that are available to use as a resource. About 92 percent of Division 1 trainers responded “Yes,” about 11% of Division 2 trainers reported “Yes” and about 20% of Division 3 athletic trainers responded positively as well. Overall, it could be said that many Division 1 trainers do have a dietitian or a nutritionist on staff, and Division 2 and Division 3 trainers do not.

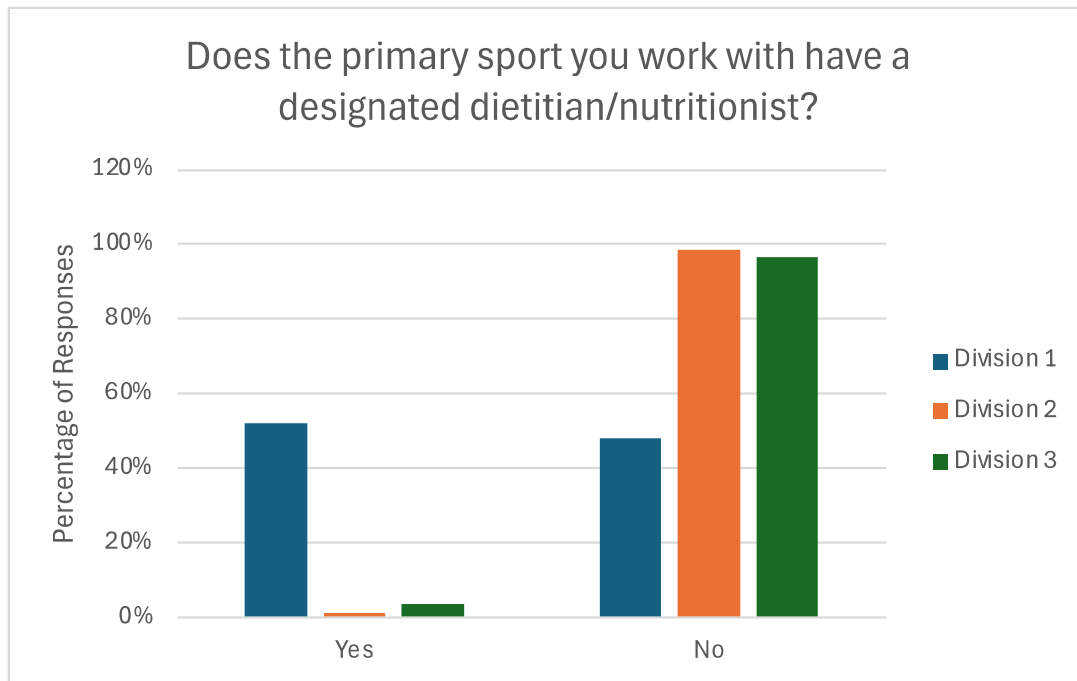


Figure 2: Percentage of Athletic Trainers by division whose primary sport has a designated dietitian/nutritionist on staff.

Chi-Squared = 161.47. P-Value = 0. DOF = 2.

Figure 2 represents the percentage of athletic trainers by division whose dietitian or nutritionist that they have on staff is designated for one specific sport. For about half of Division 1 trainers, this is the case, however almost no Division 2 or 3 athletic departments have a sport-specific dietitian or nutritionist.

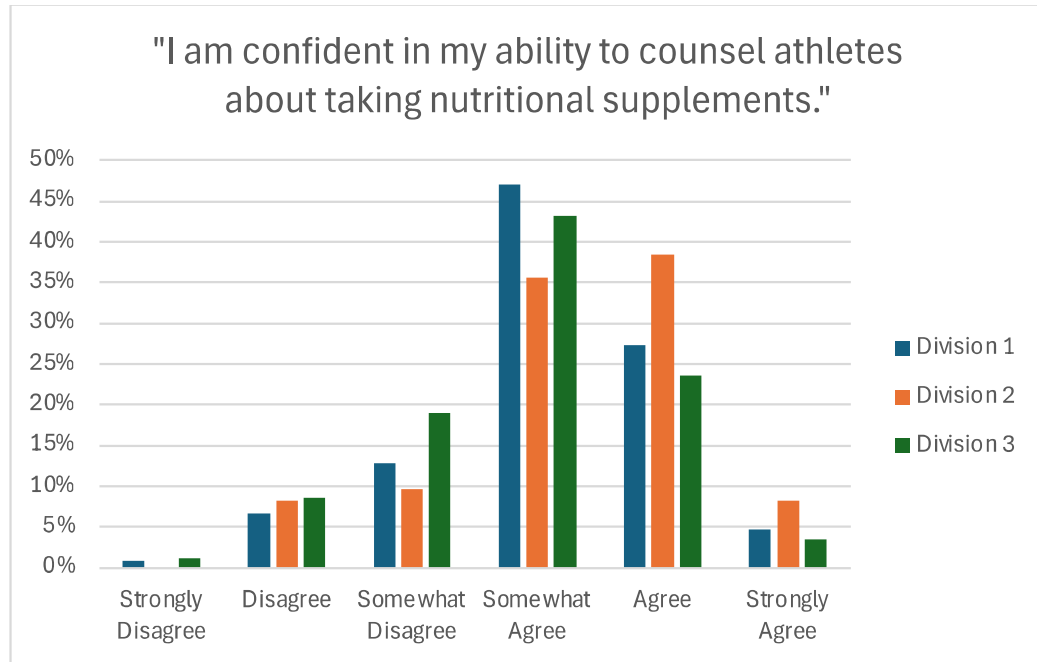


Figure 3: Confidence level of ability to counsel athletes about taking nutritional supplements by division.

Chi squared value = 19.79. P-value = 0.0313. DOF = 10.

Figure 3 reveals the confidence level of athletic trainers in counselling their athletes about taking nutritional supplements. The data is located centrally around the “Somewhat Agree” and “Agree” statements. Division 2 trainers had a higher percentage of “agree” responses, and Divisions 1 and 3 had a higher percentage of “Somewhat Agree” responses.

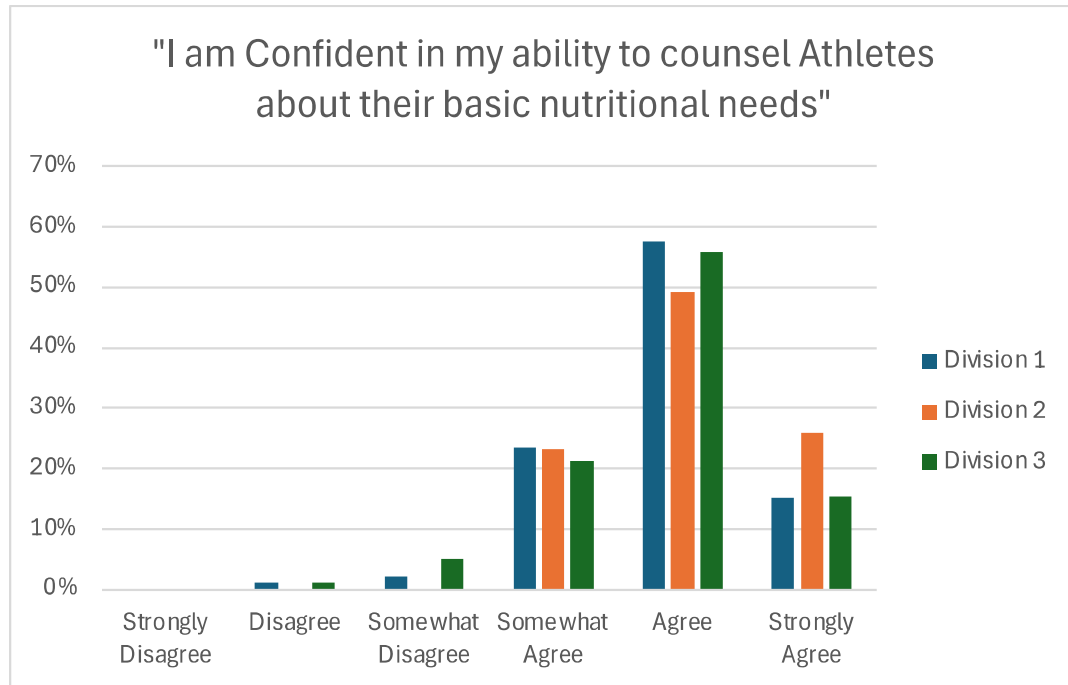


Figure 4: Confidence level of ability to counsel athletes about their basic nutritional needs by division.

Chi squared value = 12.84. P-value = 0.1174. DOF = 8.

Figure 4 reveals the confidence level of athletic trainers when counselling athletes about basic nutritional needs. The results are centrally located around the “Agree” category, and not a single athletic trainer studied strongly disagreed with the given statement.

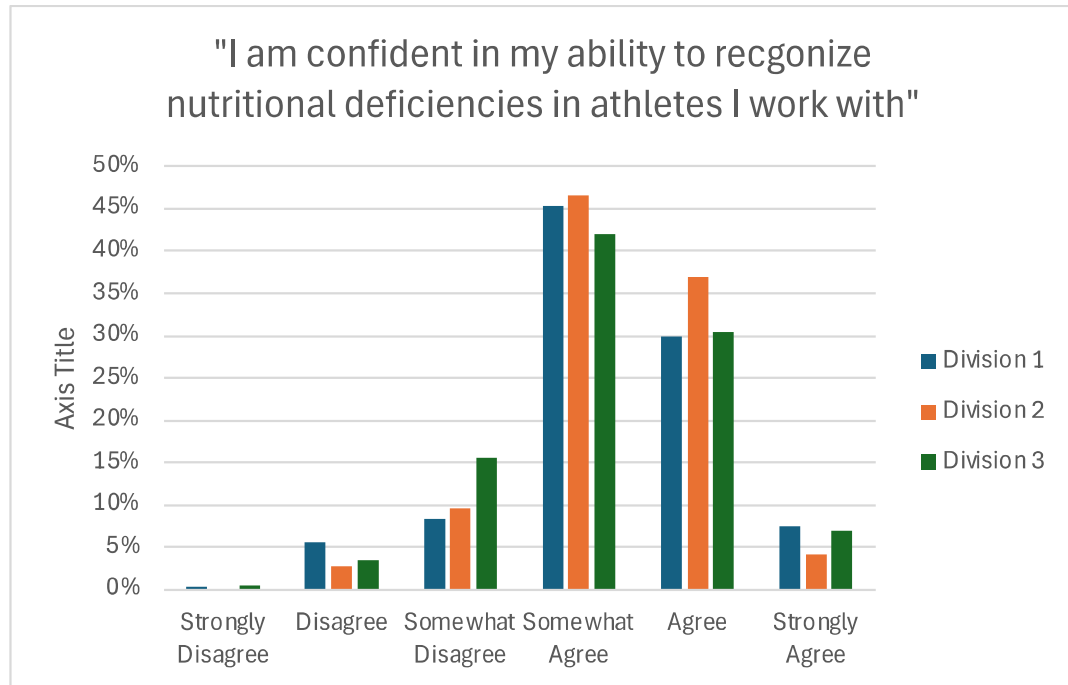


Figure 5: Confidence level of ability to recognize nutritional deficiencies in athletes worked with by division.

Chi Squared = 10.044. P-value = 0.4366. DOF = 10.

Figure 5 reveals the confidence that athletic trainers have regarding their ability to recognize nutritional deficiencies in athletes that they work with. There were a high percentage of athletic trainers who selected the “Somewhat Agree” response across all divisions.

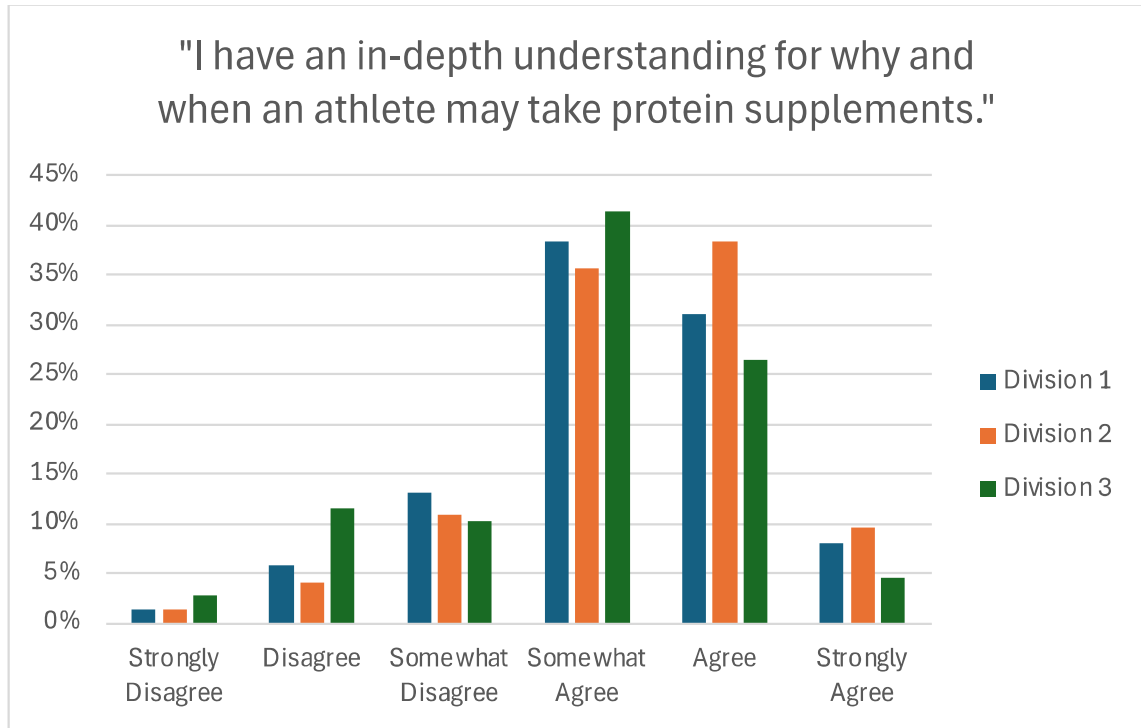


Figure 6: Level of understanding for why and when an athlete may take protein supplements by division.

Chi Squared = 13.95. P - Value = 0.1754. DOF = 10.

In Figure 6, which questioned an athletic trainer's understanding for why and when an athlete may choose to supplement with protein. The data was centered around the "somewhat agree" and "agree" categories, which means that they have an overall understanding of the reasoning behind protein supplementation.

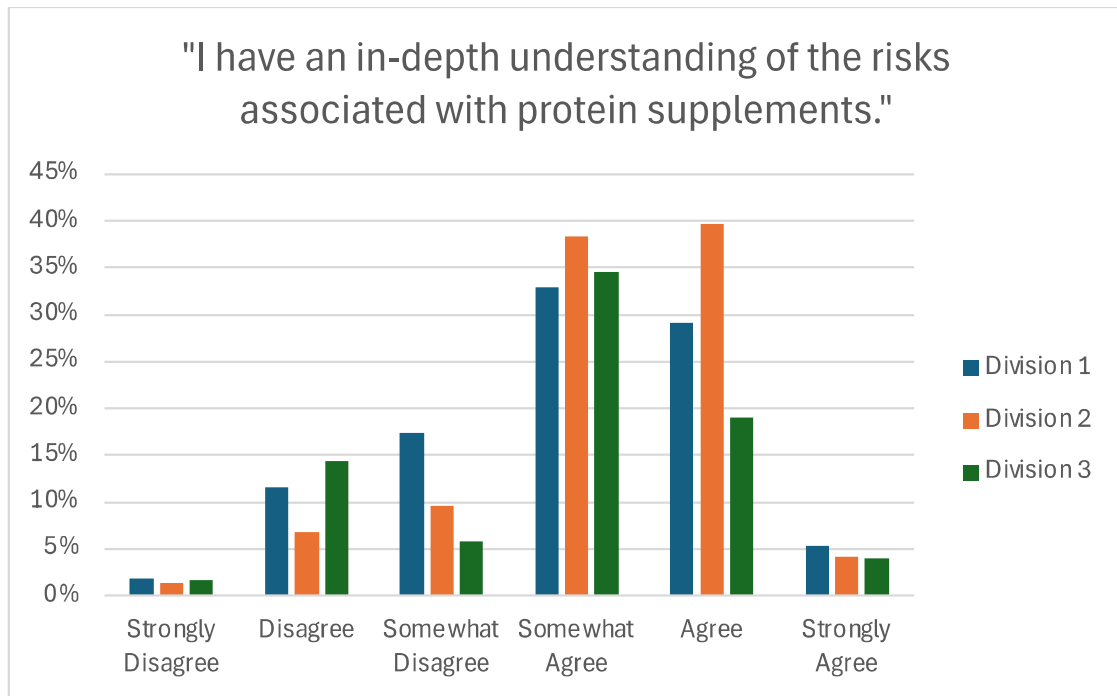


Figure 7: Level of understanding of the risks associated with protein supplements by division.

Chi Squared = 18.082. P-Value = 0.0536. DOF = 10.

Figure 7 shows the overall understanding of the potential risks associated with protein supplementation. The data is centered around the "Somewhat Agree" and "Agree" categories, where Division 2 trainers reporting a higher percentage of "Agree" responses, and Division 1 and 3 trainers responding "Somewhat Agree" at a higher percent.

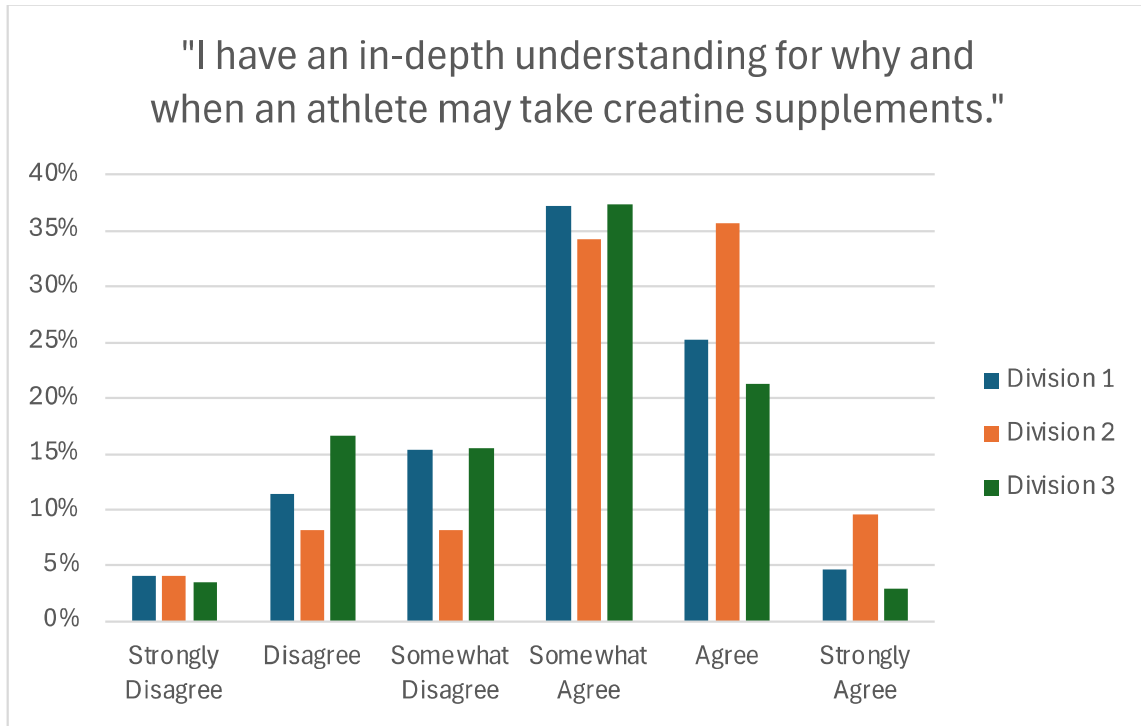


Figure 8: Level of understanding for the reasons an athlete may take creatine supplements by division.

Chi Squared = 15.31. P-Value = 0.1209. DOF = 10.

Figure 8 reveals the data questioning if an athletic trainer feels confident in their knowledge about why and when an athlete may supplement with creatine. Trainers across all divisions had the highest percentage of "Somewhat Agree" responses, though there was also a high percentage of Division 2 trainers who responded "Agree," when presented with the above statement.

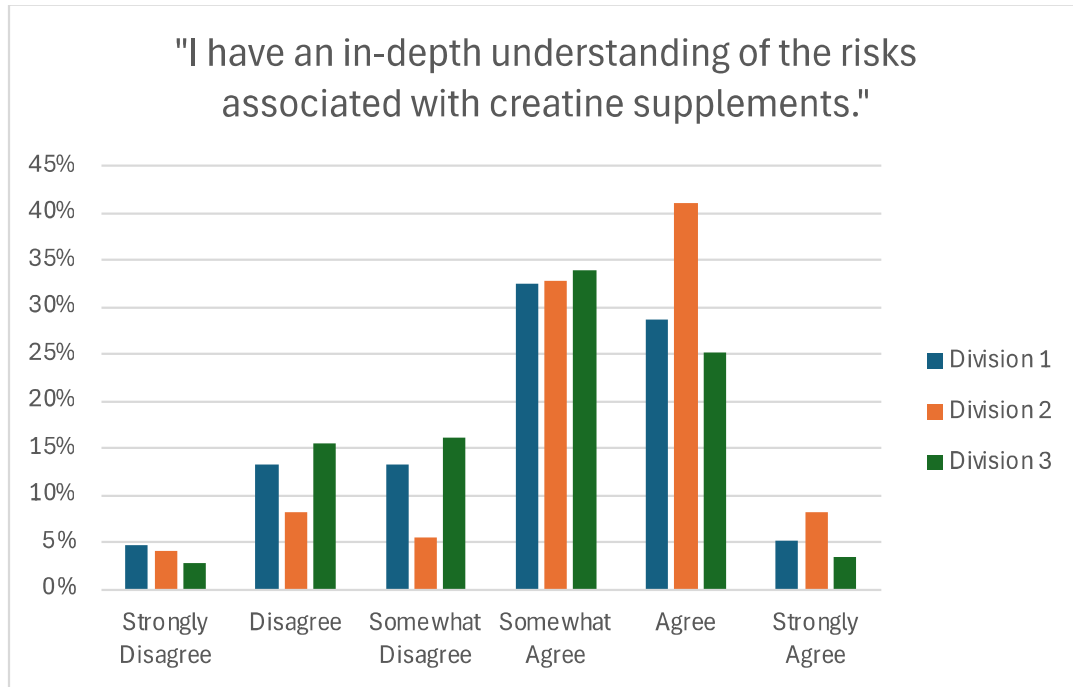


Figure 9: Level of understanding of the risks associated with creatine supplementation by division.

Chi Squared = 14.022. P-value = 0.17198. DOF = 10.

In Figure 9, athletic trainers were asked to agree with a statement questioning their understanding of the risks associated with creatine supplementation. The majority of athletic trainers in Division 1 and 3 universities selected the "Somewhat Agree" response, and Division 2 trainers selected the "Agree" response.

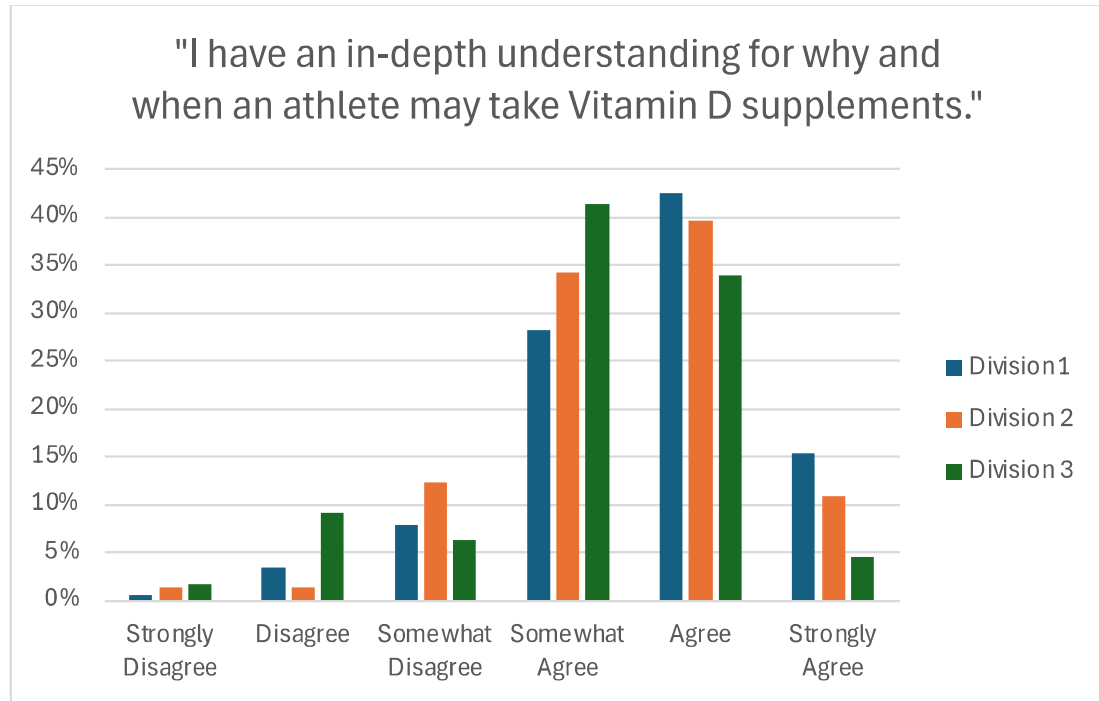


Figure 10: Level of understanding for the reasons an athlete might take Vitamin D supplements by division.

Chi Squared = 33.68. P-Value = 0.000209. DOF = 10

Figure 10 reports the findings from questioning athletic trainers about their understanding for why and when an athlete may take Vitamin D supplements. Overall, the results are centered around the "Somewhat Agree" and "Agree" categories, which is consistent in all three divisions.

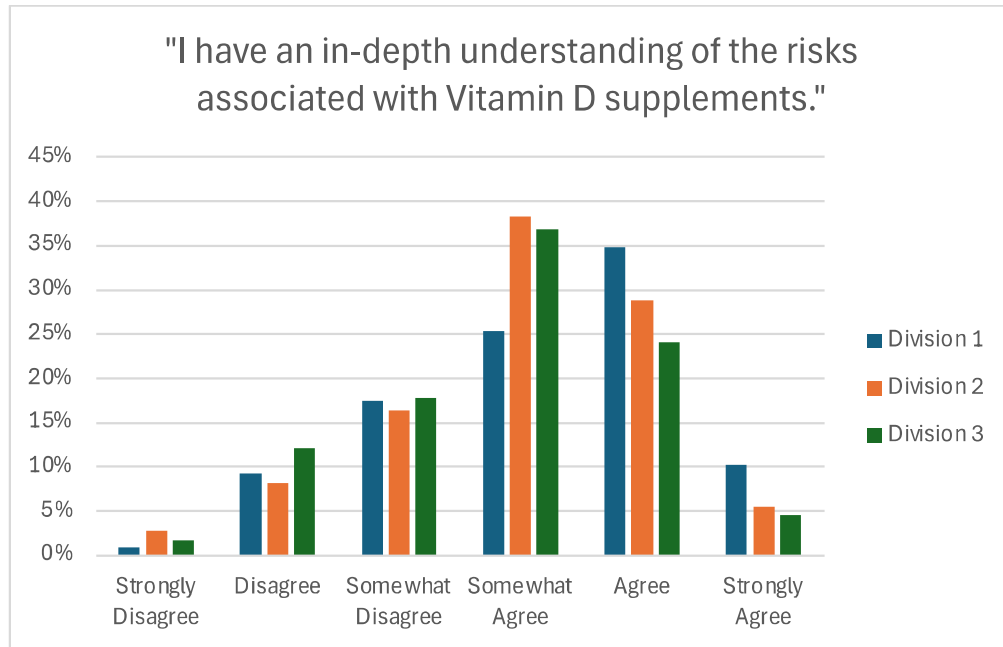


Figure 11: Level of understanding for the risks associated with Vitamin D supplementation by division.

Chi Squared = 19.389. P-Value = 0.0356. DOF = 10.

In Figure 11, the results from the survey show that all three divisions of athletic trainers “Somewhat Agree” or “Agree” with a statement which asks if the athletic trainer had an in depth understanding of the risks associated with Vitamin D supplements.

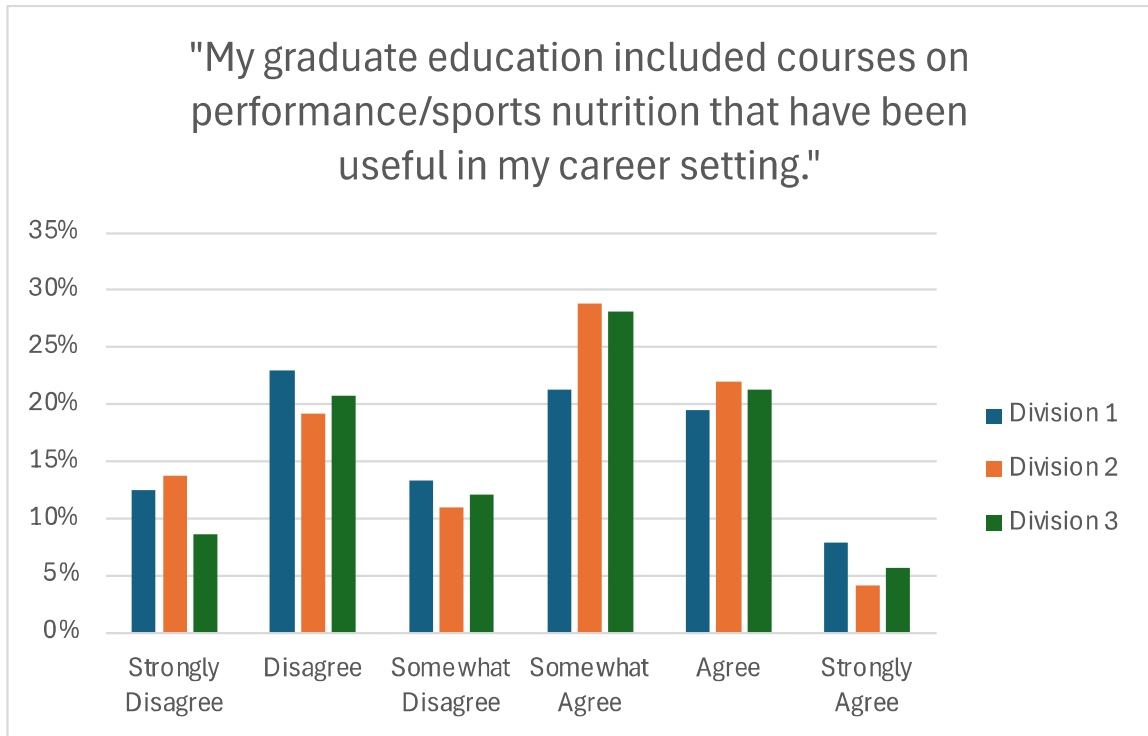


Figure 12: Statement of confidence on courses included about sports/performance nutrition in graduate education that have been useful in a career setting by division.

Chi Squared = 7.65. P-Value = 0.663. DOF = 10.

In Figure 12, the data asking about an athletic trainer's graduate education on performance and sports nutrition being useful in a career setting is distributed across all categories, with slight, but not significant, peaks around the "Disagree" and the "Somewhat Agree" categories.

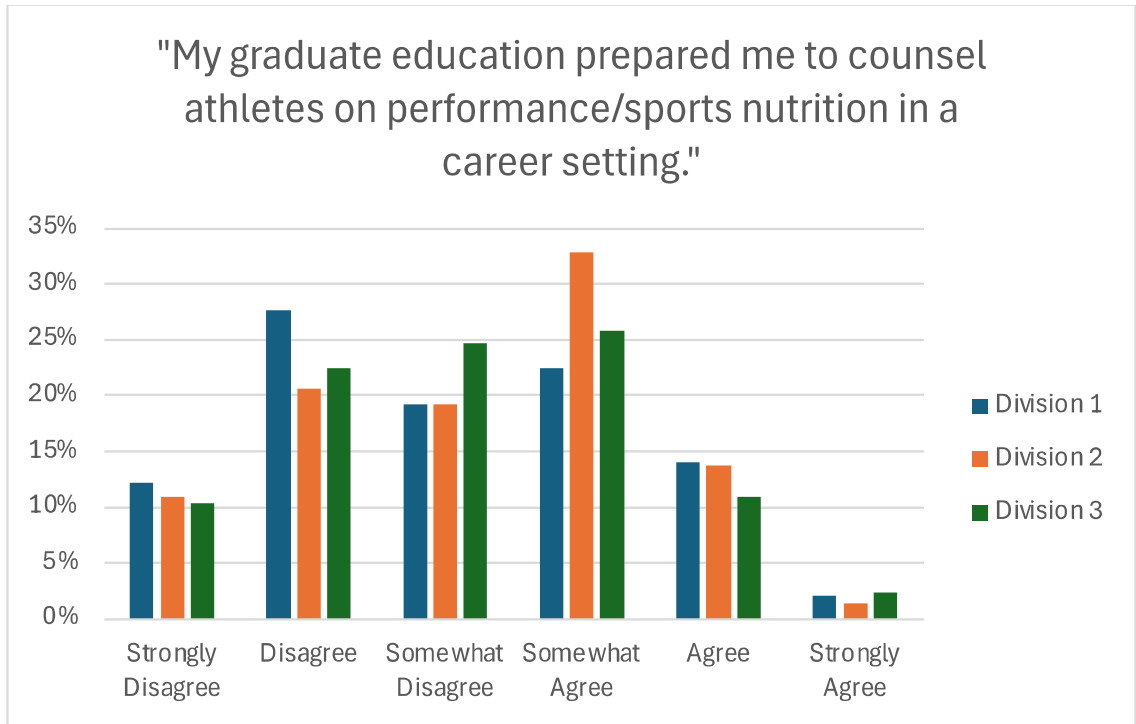


Figure 13: Statement of confidence in graduate education preparedness on sports/performance nutrition in a career setting by division.

Chi Squared = 7.97. P-Value = 0.6317. DOF = 10.

Figure 13, which questions if an athletic trainer's graduate education prepared them to counsel athletes on performance/sports nutrition in a career setting, has the highest percentage of "Strongly Disagree" responses. It has peaks at the "Disagree" and "Somewhat Agree" categories, but is skewed more towards the negative responses.

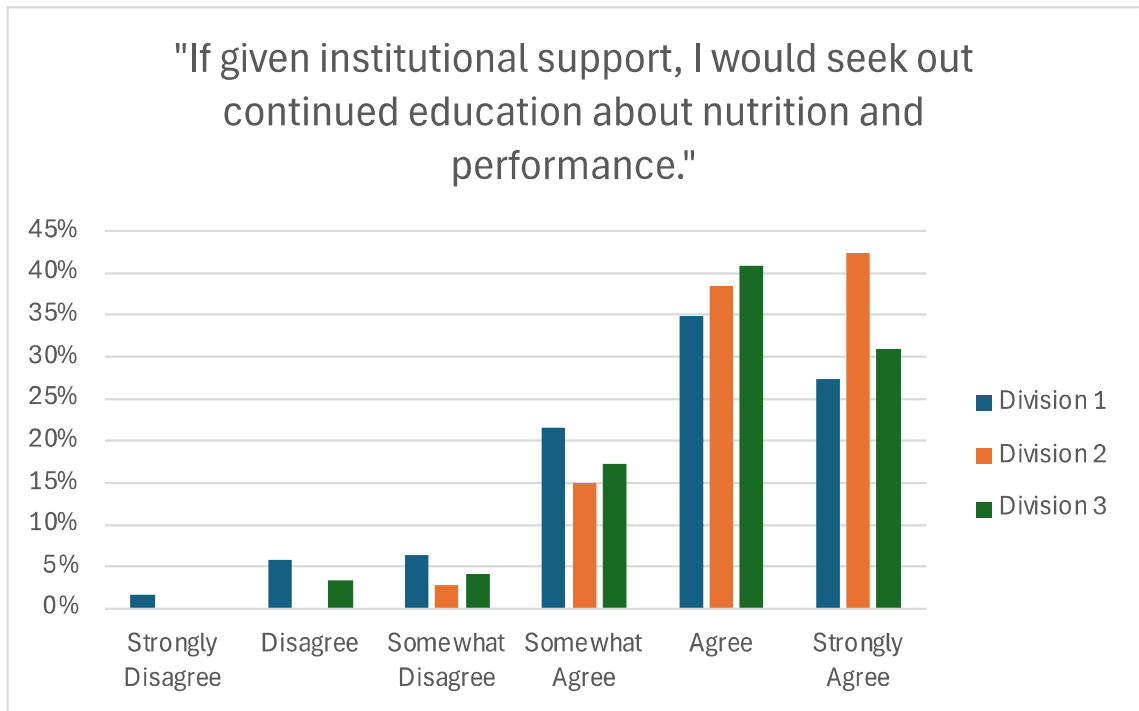


Figure 14: Statement of desire to continue education on nutrition and performance if given institutional support by division.

Chi Squared = 19.207. P-Value = 0.0377. DOF = 10.

In Figure 14, athletic trainers were asked if they would seek out continued education about nutrition and performance. Overwhelmingly, athletic trainers strongly agreed with the statement, with very few selecting “Strongly Disagree,” “Disagree,” or “Somewhat Disagree”.

Discussion

Introduction

The purpose of this thesis is to answer the following research question: “How do athletic trainers in college sports settings navigate their role in providing nutrition counselling to athletes, and how could further nutrition education help athletic trainers better support their athletes?” Data was collected from 626 athletic trainers with varying experience, differing divisions, and a variety of different sports (Table 1). It is important to note that Division 2 and Division 3 athletic trainers overwhelmingly did not have the support of a dietitian/nutritionist as a member of their staff, nor did they have one designated for their sport (Figure 1, Figure 2). However, most Division 1 trainers did have at least one dietitian/nutritionist on staff (Figure 1), and about half had a designated dietitian for their sport (Figure 2). The results can be qualitatively assessed with descriptive statistics. Overall, all the hypotheses were supported by the findings of the survey.

Hypothesis 1

“An athletic trainer, regardless of division, will not feel that they lack in knowledge about sports/performance nutrition.”

Looking at Figure 3, Figure 4, and Figure 5, the data across divisions is centrally located at the “agree” and “somewhat agree” levels, with a very low percentage of people selecting any of the disagree categories. This supports the idea that athletic trainers feel confident in their overall ability to counsel athletes about nutrition counselling. There was no significant difference between divisions regarding the ability to counsel athletes about general nutrition ($p = 0.1174$). However, about their ability to guide athletes about taking nutritional supplements, there was a significant difference between divisions in original statistical analysis ($p = 0.0313$). Thus, appropriate post-hoc unpaired two-tailed t-tests were run, and there was found to be a slightly

significant statistical difference between Division 1 and Division 3 universities ($p = 0.04238$).

This makes sense, as Division 1 and Division 3 universities are the most different in funding and staff availability.

Hypothesis 2

“Athletic trainers, regardless of division, will report not having sufficient preparation in their graduate education about nutrition and nutritional supplements such as creatine, protein, and Vitamin D.”

Figure 12 reports the findings about the quality of graduate education regarding nutrition counselling. As opposed to the other questions, the data was far more spread out, with a bimodal distribution surrounding the “somewhat agree” and the “disagree” categories. This could be an artifact of where they enrolled for graduate education, but this data was not included in the survey to ensure the anonymity of the participant. There was no significant difference between divisions ($p = 0.6630$). Compared to the rest of the questions included in the survey, there was the largest percentage of trainer’s who strongly disagreed with the statement “my graduate education included courses on performance/sports nutrition that have been useful in a career setting.”

Similarly, Figure 13 also had data that had a large spread. Figure 13 had the smallest percentage of athletic trainers who strongly agreed with the given statement. Like Figure 12, the data was slightly bimodal surrounding the “disagree” and “somewhat agree” categories. From this information, it can be said that athletic trainers overall feel that their graduate education somewhat did not prepare them to counsel athletes about sports/performance nutrition in a career setting. There was no significant difference between divisions ($p = 0.6317$).

Hypothesis 3

“Despite lack in preparation, they will have acquired knowledge about nutrition and nutritional supplements such as Vitamin D, creatine and protein throughout their careers, across all of the divisions.”

Creatine

As seen in Figure 8, athletic trainers reported having confidence in the reasons an athlete may take creatine. While there was no significant difference between division ($p = 0.1209$), it should be noted that there was a higher confidence percentage of Division 2 athletic trainers than in either of the other divisions. As the middle ground in funding and support, this makes sense because Division 2 schools often have the size and scope of Division 1 schools, however, have a more similar funding amount to Division 3 universities. Thus, division 2 trainers need to rapidly fill their gaps in knowledge to accommodate the many athletes that they give care to, without the support financially, or from a registered nutritionist on their staff.

As for knowledge of the risks associated with taking creatine, Figure 9 shows a similar pattern, with the majority of the responses around the somewhat agree and agree categories. Like Figure 8, there was a higher confidence percentage of Division 2 athletic trainers than the other two divisions, but without significance ($p = 0.1719$). However, Figures 8 and 9 show that athletic trainers have confidence in their abilities to counsel athletes about when and why they should take creatine supplements as well as the risks associated with them, supporting the hypothesis.

Protein

Figures 6 and 7 demonstrate the confidence percentage by division for an athletic trainer's overall knowledge of when and why an athlete may take protein supplements and the risks associated with taking them. Both the overall understanding and the risk follow a similar

data trend as creatine, where most of the results are centred around the “Somewhat Agree” and “Agree” categories. There was not much variation by division, however, it should be noted that Division two had a higher percentage of trainers who agreed with both statements at a larger level. That being said, there was no significant difference between division ($p = 0.1754$, $p = 0.0536$), which supports the hypothesis.

When predicting the results of the survey, it would have made sense that protein had the highest percentage of confidence in comparison with creatine and Vitamin D. This is because protein is the most used supplement in the NCAA (see Literature Review for more information). Additionally, protein is the most biologically simple dietary supplement of the three studied in this survey. However, Vitamin D (discussed below) was the supplement with the highest confidence percentage of athletic trainers. Regardless, Figure 6 and Figure 7 both support the hypothesis.

Vitamin D

Vitamin D was the final dietary supplement questioned in this survey. Figure 10 had the highest percentage of athletic trainers who strongly agreed with the statement presented about the use of Vitamin D. There was a significant difference between divisions ($p = 0.0000209$), and thus, the appropriate post-hoc tests were run, which revealed that the difference between Division 1 and Division 2 schools regarding the use of Vitamin D was significant ($p = 0.04381$). There was also a clear understanding of the risks associated with taking Vitamin D supplements, shown in Figure 11. There was also a significant difference between divisions in this category as well ($p = 0.0356$). Post-hoc testing revealed that there was a significant difference between Division 1 and Division 2 as well ($p = 0.01624$). This rejects the part of the hypothesis that states that there will be no significant difference between division. However, the data does support the

statement that athletic trainers have acquired knowledge about Vitamin D supplements, despite a lack in graduate education.

Vitamin D is a hormone which is primarily attained through sun exposure (see Literature Review for more information), and so its use likely varies geographically. Thus, a further research application to explore could be the differences by region for confidence in Vitamin D supplementation. Additionally, because Vitamin D is a hormone, it is often taught in undergraduate anatomy education, which could explain the higher percentage of confident responses. The research behind Vitamin D states that 50% of student athletes have LVD, which further supports the research findings in Figure 10, where athletic trainers are more confident in their knowledge about when and why athletes take Vitamin D supplements.

Hypothesis 4

“Across divisions, trainers will overwhelmingly desire more training and information about nutrition despite already having knowledge acquired outside their original graduate education and other sources.”

Athletic trainers reported in Figure 14 that they desired additional education about nutrition counselling in a sports setting, given that they had the support of the institution that they work for. There was a significant difference between divisions ($p = 0.0377$), and thus, appropriate post-hoc tests were run to determine where the significance lay. The post-hoc testing revealed that there was a significant difference between Division 1 and Division 2 ($p = 0.0245$). That being said, the majority of athletic trainer’s supported the hypothesis that they desired more training and information about nutrition despite having already acquired knowledge outside their graduate education.

Summary

The purpose of this thesis was to discover how athletic trainers in college sports settings navigate their role in providing nutrition counselling to athletes about overall nutritional wellbeing as well as dietary supplementation with creatine, Vitamin D and protein, and how further education may better support them in their roles. The hypotheses were supported, and there was very little difference in responses by division. Vitamin D supplementation had the highest confidence percentage, followed by creatine and protein, which had little difference from each other. Trainers in Divisions 2 and 3 reported not having the support of a registered nutritionist or dietitian on staff. The differences between Division 1 and Division 2 observed in some portions of the survey could be driven by resource availability to the athletic training staff, or more generally, funding. Additionally, the majority of all three divisions reported not having a designated nutritionist for the sport that they most often work. From this information, it can be concluded that athletic trainers are often one of the only resources that student athletes have to talk to about their health and nutrition.

This research had a larger percentage of division one and division three schools that responded to the survey. Further research could help to even out this uneven distribution by recruiting more participants from division two schools, as that group has the smallest percentage of responses. There are many opportunities for further research using these data, however, they fall beyond the scope of this thesis. Further research may delve into statistical differences based on region, years of experience, presence of a staff nutritionist, etc. I would be particularly interested in studying the differences in knowledge based on sport or studying the relationship between years of experience and confidence in nutrition counselling.

Dietary supplementation is growing to be a larger part of college athletics, and even more broadly being popularised within the general population. As three very common supplements, Vitamin D, creatine and protein use have also increased in use and popularity. By being educated about them, athletic trainers can better advise athletes about when or if they should take these supplements, as well as the risks associated with the three of them. In general, athletic trainers reported having a general understanding of these supplements, which makes sense for these well-rounded clinicians who have gone above their duty as an athletic trainer, to ensure that athletes are getting the care they need.

Conclusion

Athletic training and nutrition are two intertwining fields, and understanding the importance that each field has is essential to ensure that student athletes are receiving the best quality care that they can receive. This thesis first examined athletic training and nutrition separately and then explored their interconnectedness in college athletics.

The literature review established the importance of recognising nutritional deficiencies an athlete may have, using Relative Energy Deficiency in Sport as an example of the dangers involved with poor nutritional health. It was established that not all nutritional deficiencies stem from disordered eating; Some athletes may require supplements to meet their nutritional needs. However, there are risks associated with taking supplements, as they are not tailored to the individual athlete. The literature review communicated that sports nutrition is an incredibly complex topic and presents a large body of knowledge that clinicians must add to their repertoire to ensure that an athlete is getting the best care that they need. Without the presence of a certified nutritionist/dietitian, this role then falls on the athletic training staff.

To determine if there was sufficient knowledge and preparation in the realm of nutrition amongst athletic trainers, a survey was created and sent out to athletic trainers from a multitude of different universities across the United States (Appendix A). Research through a survey revealed a confidence in athletic trainer's knowledge of nutrition counselling and nutritional supplements. That being said the results of the survey were compiled, and it was determined that Athletic Trainers have gained knowledge about nutrition throughout their careers, however, would seek out further education if given the opportunity.

Sports at a college level are demanding of all student athletes. They consistently push their bodies to the limit to increase performance on the field, while also pursuing a college

degree. Their nutrition fuels them on and off the field, and it is important that athletic trainers have a full understanding of how best to support their patients. It is crucial for institutions to support their athletic training staff by giving them not only the resources they need to give well-rounded care to athletes but also help them further their knowledge in sports medicine to encompass nutrition.

Appendix A

Alphabetical List of Schools Within Email List

Abilene Christian University	Arkansas State University	Bemidji State University
Adrian College	Asbury University	Benedict College
Agnes Scott College	Auburn University	Benedictine University
Alabama A&M University	Augsburg University	Bentley University
Alabama State University	Augustana College – Illinois	Berea College
Albertus Magnus College	Aurora University	Berry College
Albion College	Austin College	Bethany College – West Virginia
Albright College	Austin Peay State University	Bethany Lutheran College
Alcorn State University	Averett University	Bethel University – Minnesota
Alfred State College	Azusa Pacific University	Bethune-Cookman University
Alfred University	Babson College	Biola University
Allegheny College	Baldwin Wallace University	Black Hills State University
Alma College	Ball State University	Bloomfield College
Alvernia University	Bard College	Bloomsburg University of Pennsylvania
American University	Barton University	Bluefield State University
Amherst College	Bates College	Bluffton University
Anderson University – Indiana	Baylor University	Boise State University
Anna Maria College	Belhaven University	Boston College
Appalachian State University	Bellarmino University	
Arcadia University	Belmont Abbey College	
Arizona State University	Belmont University	
	Beloit College	

Boston University	California Polytechnic State	California State University –
Bowdoin College	University –San Luis Obispo	San Bernardino
Bowie State	California State Polytechnic	California State University –
Bowling Green State	University – Pomona	San Marcos
University	California State University -	California State University –
Bradley University	Chico	Stanislaus
Bridgewater College	California State University –	California University of
Bridgewater State University	Bakersfield	Pennsylvania
Brigham Young University	California State University –	Calvin University
Brown University	Dominguez Hills	Cameron University
Bryant University	California State University –	Campbell University
Bryn Athyn College	East Bay	Canisius College
Bryn Mawr College	California State University –	Capital University
Bucknell University	Fresno	Carleton College
Buena Vista University	California State University –	Carlow University
Buffalo State College	Fullerton	Carnegie Mellon University
Bushnell University	California State University –	Carroll University
Butler University	Long Beach	Carson-Newman University
Cairn University	California State University –	Carthage College
Cal Poly Humboldt	Los Angeles	Case Western Reserve
Caldwell University	California State University –	University
California Baptist University	Monterey Bay	Catawba College
California Institute of	California State University –	Catholic University
Technology	Northridge	Cedar Crest College
California Lutheran	California State University –	Cedarville University
University	Sacramento	

Centenary College of Louisiana	Clarion University of Pennsylvania	Columbus State University
Centenary University – New Jersey	Clark Atlanta University	Concord University
Central College	Clark University	Concordia College – Minnesota
Central Connecticut State University	Clarkson University	Concordia University – Chicago
Central Michigan University	Clemson University	Concordia University – Texas
Central Washington University	Cleveland State University	Concordia University Wisconsin
Centre College	Coastal Carolina University	Concordia University, St. Paul – Minnesota
Chadron State College	Coe College	Connecticut College
Chaminade University of Honolulu	Coker University	Converse University
Chapman University	Colby College	Coppin State University
Charleston Southern University	Colby-Sawyer College	Cornell College
Chestnut Hill College	Colgate University	Cornell University
Chicago State University	College of Charleston	Covenant College
Chowan University	College of Saint Benedict	Creighton University
Christopher Newport University	College of the Holy Cross	Crown College
Claflin University	College of Wooster	Curry College
Claremont-Mudd-Scripps Colleges	Colorado Christian University	D'Youville University
	Colorado College	Daemen University
	Colorado Mesa University	Dallas Baptist University
	Colorado School of Mines	Dartmouth College
	Colorado State University	Davenport University
	Colorado State University – Pueblo	
	Columbia University	

Davidson College	East Stroudsburg University	Elmira College
Davis & Elkins College	of Pennsylvania	Elms College
Dean College	East Tennessee State	Elon University
Delaware State University	University	Embry-Riddle Aeronautical
Delaware Valley University	East Texas Baptist University	University
Delta State University	Eastern Connecticut State	Emerson College
Denison University	University	Emmanuel College – Georgia
DePaul University	Eastern Illinois University	Emmanuel College –
DePauw University	Eastern Kentucky University	Massachusetts
DeSales University	Eastern Mennonite	Emory & Henry College
Dickinson College	University	Emory University
Dominican University –	Eastern Michigan University	Emporia State University
Illinois	Eastern Nazarene College	Endicott College
Dominican University – New	Eastern New Mexico	Fairfield University
York	University	Fairleigh Dickinson
Dominican University of	Eastern University	University
California	Eastern Washington	Fairleigh Dickinson
Drake University	University	University – Florham
Drew University	Eckerd College	Fairmont State University
Drexel University	Edgewood College	Farmingdale State College
Drury University	Edinboro University	Fayetteville State University
Duke University	Edward Waters University	Felician University
Duquesne University	Elizabeth City State	Ferris State University
Earlham College	University	Ferrum College
East Carolina University	Elizabethtown College	Fitchburg State University
East Central University	Elmhurst University	

Flagler College – St.	Gannon University	Greenville University
Augustine	Gardner-Webb University	Grinnell College
Florida A&M University	Geneva College	Grove City College
Florida Atlantic University	George Fox University	Guilford College
Florida Gulf Coast University	George Mason University	Gustavus Adolphus College
Florida International	George Washington	Gwynedd Mercy University
University	University	Hamilton College
Florida Southern College	Georgetown University	Hamline University
Florida State University	Georgia College & State	Hampden-Sydney College
Florida Tech	University	Hampton University
Fontbonne University	Georgia Southern University	Hanover College
Fordham University	Georgia Southwestern State	Hardin-Simmons University
Fort Hays State University	University	Harding University
Fort Lewis College	Georgia State University	Hartwick College
Fort Valley State University	Georgia Tech	Harvard University
Framingham State University	Georgian Court University	Haverford College
Francis Marion University	Gettysburg College	Hawaii Pacific University
Franciscan University of	Glenville State University	Heidelberg University
Steubenville	Goldey-Beacom College	Henderson State University
Franklin & Marshall College	Gonzaga University	Hendrix College
Franklin College	Gordon College	High Point University
Franklin Pierce University	Grambling State University	Hilbert College
Fresno Pacific University	Grand Canyon University	Hillsdale College
Frostburg State University	Grand Valley State	Hiram College
Furman University	University	Hobart & William Smith
Gallaudet University	Greensboro College	College

Hofstra University	Ithaca College	Kutztown University of
Hollins University	Jackson State University	Pennsylvania
Holy Family University	Jacksonville State University	La Roche University
Hood College	Jacksonville University	La Salle University
Hope College	James Madison University	Lafayette College
Houghton University	John Carroll University	LaGrange College
Houston Christian University	Johns Hopkins University	Lake Erie College
Howard Payne University	Johnson & Wales University	Lake Forest College
Howard University	– Providence	Lake Superior State
Huntingdon College	Johnson C. Smith University	University
Husson University	Juniata College	Lakeland University
Idaho State University	Kalamazoo College	Lamar University
Illinois College	Kean University	Lancaster Bible College
Illinois Institute of	Keene State College	Lander University
Technology	Kennesaw State University	Lane College
Illinois State University	Kent State University	Lasell University
Illinois Wesleyan University	Kentucky State University	Lawrence University
Immaculata University	Kentucky Wesleyan College	Le Moyne College
Indiana State University	Kenyon College	Le Moyne College
Indiana University	Keuka College	Lebanon Valley College
Indiana University –	Keystone College	Lee University
Indianapolis	King University – Tennessee	Lees-McRae College
Indiana University of	King's College –	Lehigh University
Pennsylvania	Pennsylvania	LeMoyne-Owen College
Iona University	Knox College	Lenoir-Rhyne University
Iowa State University		Lesley University

LeTourneau University	Macalester College	Massachusetts Maritime
Lewis & Clark College	Maine Maritime Academy	Academy
Lewis University	Malone University	McDaniel College
Liberty University	Manchester University	McKendree University
Limestone University	Manhattan University	McMurry University
Lincoln Memorial University	Manhattanville University	McNeese State University
Lincoln University	Mansfield University of	Mercer University
Lindenwood University	Pennsylvania	Mercy College
Linfield University	Marian University –	Mercyhurst University
Lipscomb University	Wisconsin	Meredith College
Lock Haven University	Marietta College	Merrimack College
Long Island University	Marist College	Messiah University
Longwood University	Marquette University	Methodist University
Loras College	Mars Hill University	Metropolitan State University
Louisiana State University	Marshall University	of Denver
(LSU)	Martin Luther College	Miami University
Louisiana Tech University	Mary Baldwin University	Michigan State University
Loyola Marymount	Marymount University –	Michigan Technological
University	Virginia	University
Loyola University Chicago	Maryville University	Middle Tennessee State
Loyola University Maryland	Marywood University	University
Lubbock Christian University	Massachusetts College of	Middlebury College
Luther College	Liberal Arts	Midwestern State University
Lycoming College	Massachusetts Institute of	Miles College
Lynn University	Technology – MIT	Millersville University of
Lyon College		Pennsylvania

Millikin University	Montana State University –	Newberry College
Millsaps College	Billings	Newman University
Milwaukee School of	Montclair State University	Niagara University
Engineering	Moravian University	Nicholls State University
Minnesota State University –	Morehead State University	Nichols College
Mankato	Morehouse College	Norfolk State University
Minnesota State University –	Morgan State University	North Carolina A&T State
Moorhead	Mount Aloysius College	University
Minot State University	Mount Holyoke College	North Carolina Central
Misericordia University	Mount Saint Mary College –	University
Mississippi College	New York	North Carolina State
Mississippi State University	Mount St. Joseph University	University
Mississippi University for	Mount St. Mary's University	North Carolina Wesleyan
Women	Muhlenberg College	University
Missouri Southern State	Murray State University	North Central College
University	Muskingum University	North Central University
Missouri State University	Nazareth University	North Dakota State
Missouri University of	Neumann University	University
Science & Technology	New England College	North Greenville University
Missouri Western State	New Jersey City University	North Park University
University	New Jersey Institute of	Northeastern State University
Mitchell College	Technology	Northeastern University
Molloy University	New Mexico Highlands	Northern Arizona University
Monmouth College	University	Northern Illinois University
Monmouth University	New Mexico State University	Northern Kentucky
Montana State University	New York University	University

Northern Michigan University	Ohio Northern University	Pepperdine University
Northern State University	Ohio University	Pfeiffer University
Northland College	Ohio Wesleyan University	Piedmont University
Northwest Missouri State University	Oklahoma Baptist University	Pittsburg State University
Northwest Nazarene University	Oklahoma Christian University	Plymouth State University
Northwestern Oklahoma State University	Oklahoma State University	Point Loma Nazarene University
Northwestern State University of Louisiana	Old Dominion University	Pomona-Pitzer Colleges
Northwestern University	Oral Roberts University	Portland State University
Northwood University – Michigan	Oregon State University	Post University
Norwich University	Otterbein University	Prairie View A&M University
Notre Dame College	Ouachita Baptist University	Pratt Institute
Notre Dame of Maryland University	Pace University	Presbyterian College
Nova Southeastern University	Pacific Lutheran University	Princeton University
Oakland University	Pacific University	Principia College
Oberlin College	Palm Beach Atlantic University	Providence College
Occidental College	Penn State	Purdue University
Oglethorpe University	Penn State Abington	Purdue University – Fort Wayne
Ohio Dominican University	Penn State Altoona	Purdue University – Northwest
	Penn State Berks	Queens University of Charlotte
	Penn State Brandywine	Quincy University
	Penn State Erie – The Behrend College	Quinnipiac University
	Pennsylvania College of Technology	

Radford University	Rose-Hulman Institute of	Saint Mary's University of
Ramapo College of New	Technology	Minnesota
Jersey	Rosemont College	Saint Michael's College
Randolph College	Rowan University	Saint Peter's University
Randolph-Macon College	Russell Sage College	Saint Vincent College –
Regis College	Rutgers University	Pennsylvania
Regis University	Rutgers University – Camden	Salem College
Rensselaer Polytechnic	Rutgers University – Newark	Salem State University
Institute – RPI	Sacred Heart University	Salem University
Rhode Island College	Saginaw Valley State	Salisbury University
Rhodes College	University	Salve Regina University
Rice University	Saint Anselm College	Sam Houston State
Rider University	Saint Elizabeth University	University
Ripon College	Saint Francis University	Samford University
Rivier University	Saint John's University –	San Diego State University
Roanoke College	Minnesota	San Francisco State
Robert Morris University –	Saint Joseph's College of	University
Pennsylvania	Maine	San Jose State University
Roberts Wesleyan University	Saint Joseph's University	Santa Clara University
Rochester Institute of	Saint Leo University	Sarah Lawrence College
Technology	Saint Louis University	Savannah State University
Rockford University	Saint Martin's University	Schreiner University
Rockhurst University	Saint Mary's College –	Seattle Pacific University
Roger Williams University	Indiana	Seattle University
Rogers State University	Saint Mary's College of	Seton Hall University
Rollins College	California	Seton Hill University

Sewanee – The University of the South	Southern Connecticut State University	Springfield College
Shaw University	Southern Illinois University	St. Bonaventure University
Shenandoah University	Carbondale	St. Catherine University
Shepherd University	Southern Illinois University	St. Cloud State University
Shorter University	Edwardsville	St. Edward's University
Siena College	Southern Methodist	St. John Fisher College
Simmons University	University – SMU	St. John's University – New York
Simpson College	Southern Nazarene	St. Joseph's University, New York L.I.
Skidmore College	University	St. Lawrence University
Slippery Rock University	Southern New Hampshire	St. Mary's College of Maryland
Smith College	University	St. Mary's University – Texas
Sonoma State University	Southern University & A&M	St. Norbert College
South Carolina State	College	St. Olaf College
University	Southern Utah University	St. Thomas Aquinas College
South Dakota Mines	Southern Virginia University	Stanford University
South Dakota State	Southern Wesleyan	Stephen F Austin State
University	University	University
Southeast Missouri State	Southwest Baptist University	Stetson University
University	Southwest Minnesota State	Stevens Institute of Technology
Southeastern Louisiana	University	Stevenson University
University	Southwestern Oklahoma	Stockton University
Southeastern Oklahoma State	State University	Stonehill College
University	Southwestern University	
Southern Arkansas	Spalding University	
University	Spring Hill College	

Stony Brook University	Sweet Briar College	The University of Virginia's
Suffolk University	Syracuse University	College at Wise
Sul Ross State University	Tarleton State University	Thiel College
SUNY Canton	Temple University	Thomas College
SUNY College at Brockport	Tennessee State University	Thomas Jefferson University
SUNY College at Old Westbury	Tennessee Technological University	Thomas More University
SUNY College at Oneonta	Texas A&M International University	Tiffin University
SUNY College of Agriculture & Technology at Cobleskill	Texas A&M University	Towson University
SUNY Cortland	Texas A&M University – Commerce	Transylvania University
SUNY Delhi	Texas A&M University – Corpus Christi	Trevecca Nazarene University
SUNY Fredonia	Texas Christian University	Trine University
SUNY Geneseo	Texas Lutheran University	Trinity College – Connecticut
SUNY Maritime College	Texas Southern University	Trinity University – Texas
SUNY Morrisville	Texas State University	Trinity Washington University
SUNY New Paltz	Texas Tech University	Troy University
SUNY Oswego	Texas Woman's University	Truman State University
SUNY Plattsburgh	The Citadel	Tufts University
SUNY Polytechnic Institute	The College of New Jersey	Tulane University
SUNY Potsdam	The College of Saint Rose	Tusculum University
SUNY Purchase College	The College of St. Scholastica	Tuskegee University
SUNY University at Buffalo	The Ohio State University	U.S. Air Force Academy
Susquehanna University		U.S. Military Academy
Swarthmore College		U.S. Naval Academy
		Union College – New York

Union University	University of California –	University of Colorado –
United States Coast Guard	Berkeley	Boulder
Academy	University of California –	University of Colorado –
United States Merchant	Davis	Colorado Springs
Marine Academy	University of California –	University of Connecticut
University at Albany	Irvine	University of Dallas
University of Alabama	University of California –	University of Dayton
University of Alabama –	Los Angeles	University of Delaware
Birmingham	University of California –	University of Denver
University of Alabama –	Riverside	University of Detroit Mercy
Huntsville	University of California –	University of Dubuque
University of Alaska –	San Diego	University of Evansville
Anchorage	University of California –	University of Findlay
University of Alaska –	Santa Barbara	University of Florida
Fairbanks	University of California –	University of Georgia
University of Arizona	Santa Cruz	University of Hartford
University of Arkansas	University of Central	University of Hawaii at Hilo
University of Arkansas – Fort	Arkansas	University of Hawaii at
Smith	University of Central Florida	Manoa
University of Arkansas at	University of Central	University of Houston
Little Rock	Missouri	University of Idaho
University of Arkansas at	University of Central	University of Illinois
Monticello	Oklahoma	University of Illinois at
University of Arkansas at	University of Charleston	Chicago
Pine Bluff	University of Chicago	University of Illinois at
University of Bridgeport	University of Cincinnati	Springfield

University of Indianapolis	University of Massachusetts	University of Mount Union
University of Iowa	– Amherst	University of Nebraska
University of Kansas	University of Massachusetts	University of Nebraska at
University of Kentucky	– Boston	Kearney
University of La Verne	University of Massachusetts	University of Nebraska at
University of Louisiana –	– Dartmouth	Omaha
Monroe	University of Massachusetts	University of Nevada – Las
University of Louisiana at	– Lowell	Vegas
Lafayette	University of Memphis	University of Nevada – Reno
University of Louisville	University of Minnesota	University of New England
University of Lynchburg	University of Minnesota –	University of New
University of Maine	Crookston	Hampshire
University of Maine at	University of Minnesota –	University of New Haven
Farmington	Duluth	University of New Mexico
University of Maine at	University of Minnesota –	University of New Orleans
Presque Isle	Morris	University of North Alabama
University of Mary	University of Mississippi	University of North Carolina
University of Mary Hardin-	University of Missouri	– Greensboro
Baylor	University of Missouri –	University of North Carolina
University of Mary	Kansas City	– Wilmington
Washington	University of Missouri – St.	University of North Carolina
University of Maryland	Louis	Asheville
University of Maryland –	University of Montana	University of North Carolina
Baltimore County	University of Montevallo	at Chapel Hill
University of Maryland	University of Mount Saint	University of North Carolina
Eastern Shore	Vincent	at Charlotte

University of North Carolina at Pembroke	University of Redlands	University of St. Thomas – Minnesota
University of North Dakota	University of Rhode Island	University of St. Thomas – Texas
University of North Florida	University of Richmond	University of Tampa
University of North Georgia	University of Rochester	University of Tennessee
University of North Texas	University of Saint Joseph	University of Tennessee – Chattanooga
University of Northern Colorado	University of San Diego	University of Tennessee – Martin
University of Northern Iowa	University of San Francisco	University of Texas – Arlington
University of Northwestern – St. Paul	University of Scranton	University of Texas – Austin
University of Notre Dame	University of Sioux Falls	University of Texas – El Paso
University of Oklahoma	University of South Alabama	University of Texas – Permian Basin
University of Olivet	University of South Carolina	University of Texas – Rio Grande Valley
University of Oregon	University of South Carolina – Beaufort	University of Texas – San Antonio
University of Pennsylvania – Penn	University of South Carolina – Upstate	University of Texas – Tyler
University of Pittsburgh	University of South Dakota	University of Texas at Dallas
University of Pittsburgh – Bradford	University of South Florida	University of the District of Columbia
University of Pittsburgh – Greensburg	University of Southern California	University of the Incarnate Word
University of Pittsburgh – Johnstown	University of Southern Indiana	
University of Portland	University of Southern Maine	
University of Puget Sound	University of Southern Mississippi	

University of the Ozarks	University of Wisconsin –	Vermont State University –
University of the Pacific	Platteville	Johnson
University of Toledo	University of Wisconsin –	Villanova University
University of Tulsa	River Falls	Virginia Commonwealth
University of Utah	University of Wisconsin –	University
University of Valley Forge	Stevens Point	Virginia Military Institute –
University of Vermont	University of Wisconsin –	VMI
University of Virginia	Stout	Virginia State University
University of Washington	University of Wisconsin –	Virginia Tech
University of West Alabama	Superior	Virginia Union University
University of West Florida	University of Wisconsin –	Virginia Wesleyan University
University of West Georgia	Whitewater	Wabash College
University of West Georgia	University of Wyoming	Wagner College
University of Wisconsin	Upper Iowa University	Wake Forest University
University of Wisconsin –	Ursinus College	Walsh University
Eau Claire	Ursuline College	Warren Wilson College
University of Wisconsin –	Utah State University	Wartburg College
Green Bay	Utah Tech University	Washburn University
University of Wisconsin – La	Utah Valley University	Washington & Jefferson
Crosse	Utica University	College
University of Wisconsin –	Valdosta State University	Washington & Lee
Milwaukee	Valparaiso University	University
University of Wisconsin –	Vanderbilt University	Washington College
Oshkosh	Vassar College	Washington State University
University of Wisconsin –	Vermont State University –	Washington University in St.
Parkside	Castleton	Louis

Wayne State College	Western New Mexico	William Paterson University
Wayne State University	University	of New Jersey
Waynesburg University	Western Oregon University	William Peace University
Weber State University	Western Washington	Williams College
Wellesley College	University	Wilmington College
Wentworth Institute of	Westfield State University	Wilmington University
Technology	Westminster College –	Wilson College
Wesleyan College	Missouri	Wingate University
West Chester University of	Westminster College –	Winthrop University
Pennsylvania	Pennsylvania	Wisconsin Lutheran College
West Liberty University	Westminster College – Utah	Wittenberg University
West Texas A&M University	Westmont College	Wofford College
West Virginia State	Wheaton College – Illinois	Worcester Polytechnic
University	Wheaton College –	Institute
West Virginia University	Massachusetts	Worcester State University
West Virginia Wesleyan	Wheeling University	Wright State University
College	Whitman College	Xavier University
Western Carolina University	Whittier College	Yale University
Western Colorado University	Whitworth University	Yeshiva University
Western Connecticut State	Wichita State University	York College of
University	Widener University	Pennsylvania
Western Illinois University	Wilkes University	Youngstown State University
Western Kentucky University	Willamette University	
Western Michigan University	William & Mary	
Western New England	William Jessup University	
University	William Jewell College	

Appendix B

Consent Statement

Study Title: The intersection of athletic training and nutrition counselling in regards to dietary supplements.

IRB: An Institutional Review Board (“IRB”) is overseeing this research. An IRB is a group of people who perform independent review of research studies to ensure the rights and welfare of participants are protected. UO Research Compliance Services is the office that supports the IRB. If you have questions about your rights or wish to speak with someone other than the research team, you may contact the University of Oregon Research researchcompliance@uoregon.edu

Purpose of Study: You are invited to participate in a research study that will examine the role that athletic trainer’s play in nutrition counselling. You must be at least 18 years of age, a certified athletic trainer, and work for an NCAA school.

Procedure: If you choose to participate, you will be answering some questions about your duties as an athletic trainer, including the sport you primarily work with. You will rank your confidence in topics surrounding nutrition. The survey is expected to take approximately 10 minutes.

Potential Risks and Benefits: It is unlikely that there will be any risks or discomfort while participating in this survey beyond everyday life. There are no specific benefits while participating.

Confidentiality: The data collected in this research is completely anonymous. No personally identifiable information will be collected, and the information you may choose to provide in this study cannot be connected back to you. Results from this study may be published or presented, and the anonymous data may be shared with other researchers.

Voluntary: Your participation in this study is completely voluntary and you may choose to participate or end your participation without penalty.

Questions or Concerns: Should you have any questions, comments or concerns about this study please feel welcome to contact the researcher: Audrey Pedersen (714) 656-6428 apeders3@uoregon.edu

Consent: I have read and understand the above consent form. I certify that I am 18 years old or older. By clicking the “Next” button to enter the survey, I indicate my willingness to voluntarily take part in this study.

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