

THE ROLE AND AWARENESS OF SPORTS DIETITIANS IN THE UNITED
STATES

A THESIS

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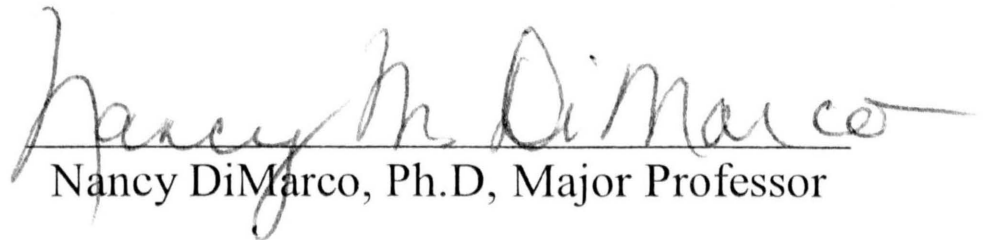
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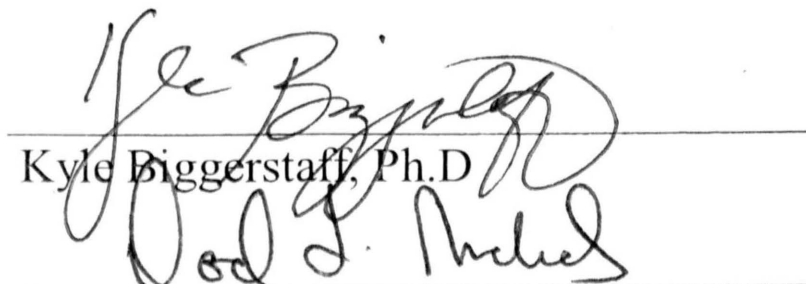
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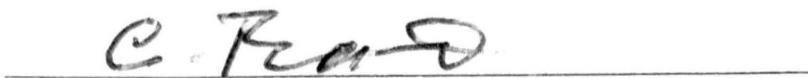
I am submitting herewith a thesis written by Nakia Westbrook entitled "The Role and Awareness of Sports Dietitians in the United States." I have examined this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of M.S. with a major in Exercise and Sports Nutrition.


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ABSTRACT

NAKIA WESTBROOK

THE ROLE AND AWARENESS OF SPORTS DIETITIANS IN THE UNITED STATES

MAY 2011

The purpose of this study was to assess sports nutrition knowledge, opinions, and practice as well as determine awareness of the Certified Specialist in Sports Dietetics (CSSD) credential among attendees of the 2010 American College of Sports Medicine (ACSM) National Conference in Baltimore, MD. Forty-five participants who visited the Sports, Cardiovascular, and Wellness Nutrition booth in the exhibit hall of the conference completed an optional sports nutrition questionnaire. Data were analyzed using descriptive statistics. Percentages were used to determine frequency of answers. The results of this study showed that sports dietitians/CSSDs were utilized less than 50% of the time in sports nutrition settings, and 19% of participants were aware of the CSSD credential. It is imperative that athletes and other athletic professionals recognize and utilize sports dietitians to provide safe and effective nutrition guidance, and counseling for health and performance for athletes.

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CHAPTER I

INTRODUCTION

Background

Registered dietitians are food and nutrition experts who have met all academic and professional requirements to qualify for the credential “registered dietitian” (American Dietetic Association (ADA), 2011). Registered dietitians work in the treatment and prevention of disease by implementing the nutrition care process (ADA, 2011). In order to become a registered dietitian, a bachelor’s degree from a college or university with coursework approved by the Commission on Accreditation for Dietetics Education (CADE) of the American Dietetic Association is required (ADA, 2011). Once a bachelor’s degree is obtained, a supervised practice program approved by CADE must be completed (ADA, 2011). Following completion of supervised practice, a national examination administered by the Commission on Dietetic Registration (CDR) must be passed, and continuing professional education is required to maintain registration (ADA, 2011). Registered dietitians work in a variety of settings. Sports nutrition is an area where registered dietitians are becoming more prevalent; therefore, the sports dietitian is considered an expert in the field of sports nutrition and provides individual and group counseling and education to enhance the performance of competitive and recreational athletes (Sports, Cardiovascular, and Wellness Nutrition [SCAN], 2010).

Sports dietitians work with athletes both at on-site locations as well as during travel (SCAN, 2010). Sports dietitians are identified as experts in the field of sports nutrition by obtaining a specialty certification through the Commission on Dietetic Registration (CDR) (SCAN, 2010).

The Board Certified Specialist in Sports Dietetics (CSSD) credential was created by the Commission on Dietetic Registration, the credentialing agency of the American Dietetic Association (ADA) in the fall of 2005 (CDR, 2010). The Sports Dietetics Specialty Analysis Practice Workgroup (SPAW), composed of SCAN members and appointed by CDR, assisted CDR in developing a definition of sports dietitian, eligibility criteria for the specialty certification, a content outline and a list of references for the specialty examination (SCAN, 2010). The first CSSD specialty examination was conducted in June 2006 (SCAN, 2010). The CSSD examination tests knowledge in the following competencies:

- Energy metabolism and weight management
- Macronutrients and micronutrients of active individuals
- Nutrition assessment
- Training, competition, and recovery
- Disordered eating and body image
- Nutrition for special populations

The CSSD is considered the premier professional sports nutrition credential in the United States (SCAN, 2010). The CSSD specialty certification was created to differentiate sports dietitians from those who are less qualified to provide sports nutrition services (SCAN, 2010). Since 2006, almost 500 registered dietitians have successfully passed the examination to become a CSSD to set them apart as experts in the field of sports nutrition (CDR, 2010).

The applicant for the CSSD exam must be a current registered dietitian (RD) who has maintained RD status for 2 years (CDR, 2010). The applicant must also document 1,500 hours of specialty sports nutrition practice for eligibility to take the certification exam (CDR, 2010). After each five year period, the applicant must retake the certification examination to maintain the CSSD credential as well as earn 75 hours of continuing education and 1,000 hours of specialty sports nutrition practice (CDR, 2010).

Purpose/Significance of the Thesis

The nutritional needs of competitive athletes differ from the general population and are dependent upon numerous factors, including type of sport and length of training. The rising popularity of the health and nutrition industry has created growing interest in sports-related nutrition. As interest continues to rise, athletes and members of athletic staffs sometimes turn to unreliable sources of sports nutrition information. This creates confusion regarding the expertise and qualifications of those dispensing sports nutrition information (Eberle, 2005). Subsequently, athletes tend to view coaches and other

members of the athletic staff as nutrition professionals from whom they may acquire a majority of their nutrition information and advice. This can diminish the credibility of the board certified sports dietitian, or CSSD, as the premier professional in sports nutrition in the United States. Furthermore, sports nutrition is currently an unregulated profession, allowing unethical practitioners and individuals without the necessary skills and qualifications to practice, which may result in many athletes obtaining information from less reliable sources, which may also include the media and supplement companies (Gilbert, 2008). However, the CSSD credential conveys a strict and concrete standard comparable to that of other health professionals such as physicians, nurses, and physical therapists (Eberle, 2005). A sports dietitian should, therefore, be a core member of the sports science and/or medical support team, with regular opportunities to discuss nutrition for performance with athletes and coaches and to provide informed decisions about individual, team, or club nutrition strategies (Gilbert, 2008). The skills of the nutrition practitioner in sport can be important in determining the performance of all elite performers from youth development through world class talent (Gilbert, 2008). It is imperative that athletes and other athletic professionals recognize and utilize sports dietitians to provide safe, effective, evidence-based nutrition assessment, guidance, and counseling for health and performance for athletes, sports organizations, and physically active individuals and groups (American Dietetic Association (ADA), Dietitians of Canada [DOC], and the American College of Sports Medicine [ACSM], 2009). Sports dietitians and CSSDs can be marketed as the premier sports nutrition professionals in the

United States because they provide comprehensive, evidenced-based nutritional services to the athlete as well as the athletic staff. The purpose of this study was to determine sports nutrition knowledge, opinions, and practice as well as determine awareness of the Certified Specialist in Sports Dietetics (CSSD) credential among attendees of the 2010 American College of Sports Medicine National Conference.

Definition of Terms

Registered dietitian: a food and nutrition expert who has met the minimum academic and professional requirements to qualify for the credential, registered dietitian (ADA, 2010).

Sports Dietetics Practitioner: experienced registered dietitians who apply evidenced-based nutrition knowledge in exercise and sports. They assess, educate, and counsel athletes and active individuals. They design, implement, and manage safe and effective nutrition strategies that enhance lifelong health, fitness, and optimal performance (CDR, 2010).

Sports, Cardiovascular, and Wellness Nutrition: a dietetic practice group of the American Dietetic Association whose almost 6,000 members are experts in nutrition for athletic performance, fitness and weight management, cardiovascular health, wellness, and the prevention and treatment of disordered eating and eating disorders (SCAN, 2010).

Commission on Dietetic Registration: the credentialing agency for the American Dietetic Association (ADA, 2010)

Assumptions/Limitations

The following assumptions were made:

- The participants fully understood the directions and purpose of the survey prior to completion.
- Each participant answered the questions truthfully and to the best of their knowledge.

Because this data was collected at an annual meeting of the American College of Sports Medicine, a professional society providing basic and applied exercise science conferences, meetings and workshops, the results may not generalize to the general population.

CHAPTER II

REVIEW OF LITERATURE

Statement of the Problem

The practice of utilizing sports dietitians is not nationally widespread and athletes frequently identify coaches, athletic trainers, physicians, teammates, and popular media as primary sources of nutrition information (Rockwell, Nickols-Richardson, &Thye, 2001). A recent study examining nutrition practices included all coaching and athletic training staff from 21 Division I institutions in the United States (Rockwell et al., 2001). The participants were administered a three-section questionnaire used to determine nutrition knowledge, nutrition opinions and practices, and demographic information (Rockwell et al., 2001). Participants tended to use these nutrition sources (in order from greatest usage to least usage): magazines, other sources (unspecified), physicians, books, scientific journals, dietitians, and videos (Rockwell et al., 2001). This illustrates that the sports dietitian is not the most frequent source of nutrition information among athletes.

The certified athletic trainer is an integral part of the sports medicine team, who, in large university sports settings, such as Division I schools, is accessible on a daily basis (Burns, Schiller, Merrick, & Wolf, 2004). According to Burns et al in 2004, athletes tend to use athletic trainers as their most frequent source of nutrition information, and were perceived by athletes to have good knowledge of nutrition, even though dietitians

were available in approximately half of the athletic departments included in the study (Burns et al., 2004). Nearly 40% of athletes identified athletic trainers as their primary source of nutrition information whereas only 14.4% identified a registered dietitian as their primary source of information (Burns et al., 2004). Not all athletic trainers and coaches have formal training in nutrition; therefore, athlete use of practitioners other than qualified dietitians could indicate that athletes may be ill-informed or simply lack the opportunity or funding to seek advice from sports dietitians (Gilbert, 2008). Because sports nutrition is such a vital component to athletic performance, a sports dietitian should be consulted to train coaches, athletic trainers, and other staff members in instances where a sports dietitian is not readily available to an athletic department (Rockwell et al., 2001). If athletes are not provided with ample nutrition resources, such as access to a sports dietitian, they may continue to depend on their coaches and athletic trainers for information and guidance (Rockwell et al., 2001).

Recent interest in sports nutrition has prompted countless organizations to develop sports nutrition certification programs. None of these organizations, however, carry the clout of the American Dietetic Association (Kalman & Campbell, 2004). Moreover, none of these organizations are able to obtain recognition for their certifications by state governments or the Department of Education (Kalman & Campbell, 2004). The Texas Dietetics and Nutrition Practice Act, which took effect September 1, 2009, regulates the licensing and practice of nutrition care services provided in Texas (Davis, 2009). This Act states that unless the person holds an

appropriate license or registration issued by the Commission on Dietetic Registration (CDR), a person may not engage in any of the following activities:

- Use the title or represent or imply that the person has the title “dietitian”, “licensed dietitian (LD)”, licensed dietitian and nutritionist (LDN)”, “nutritionist”, “nutrition therapist (LNT)”, “licensed nutritionist (LN)”, or “provisional licensed dietitian (PLD)”
- Use the letters “LD”, “LDN”, “LNT”, “LN”, or “PLD”
- Use a facsimile of those titles to indicate or imply that the person is a dietitian, licensed dietitian, licensed dietitian and nutritionist, nutritionist, nutrition therapist, licensed nutritionist, or provisional licensed dietitian
- Engage in the practice of dietetics and nutrition care service (medical nutrition therapy) for compensation

Registered dietitians are credentialed through the CDR, which is fully accredited by the National Commission for Certifying Agencies (NCCA), the accrediting arm of the Institute for Credentialing Excellence based in Washington, D.C. (CDR, 2010). Once credentialing is obtained, the CDR believes it is in the best interest of the profession and the public it serves to have a code of ethics in place that provides guidance to dietetics practitioners in their professional practice and conduct (ADA, 2009). Therefore, dietetic practitioners have voluntarily adopted a Code of Ethics to reflect the values and ethical principles guiding the dietetic profession and to set forth commitments and obligations of

the dietetic practitioner to the public, clients, the profession, colleagues, and other professionals (ADA, 2009). The Code of Ethics is approved by the American Dietetic Association Board of Directors, House of Delegates, and the Commission on Dietetic Registration (ADA, 2009).

Core competencies in nutrient metabolism (biochemistry and metabolism), exercise physiology, and psychology are the initial parameters for a successful career in sports nutrition (Kalman & Campbell, 2004). In contrast, most nutrition certifications require only a high school diploma or equivalent and few require formal education in nutrition. The scope of practice for a sports nutritionist versus a sports dietitian differs drastically. A sports nutritionist can legally dispense nutrition information and provide education pertaining to physical performance and body composition (International Society of Sports Nutrition, 2010). However, registered dietitians implement the nutrition care process (NCP), established by the American Dietetic Association (ADA 2003). The NCP is a systematic problem-solving method that dietetic professionals use to critically think and make decisions to address nutrition-related problems and provide safe, effective, high quality nutrition care (ADA, 2003). The adoption of the NCP has the potential to standardize sports nutrition practice by serving as a structure and framework for providing nutrition services (Rosenbloom, 2005). The four steps are nutrition assessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation (ADA, 2003). The four steps of the NCP are described using the International Dietetics and Nutrition Terminology (IDNT), which is the standardized language or controlled

vocabulary used to describe unique functions of dietetics (ADA, 2008). The intent of the NCP is to describe accurately the spectrum of nutrition care that can be provided by dietetic professionals only, who are uniquely qualified by virtue of academic and supervised practice training and appropriate certification and/or licensure to provide a comprehensive array of professional services relating to the prevention or treatment of nutrition-related illness (ADA, 2003). Furthermore, adoption of the NCP has the potential to standardize sports nutrition practice by serving as a structure and framework for providing nutrition services (Rosenbloom, 2005). The NCP supports and promotes individualized care, using critical thinking to creatively arrive at a solution that works best for the athlete or the team (Rosenbloom, 2005). Also, only registered dietitians are legally allowed to provide medical nutrition therapy, which is an essential component of comprehensive health care (ADA, 2010). Sports medical nutrition therapy involves the ongoing assessment of the nutritional risk status and nutrition intervention (s) for individuals with a condition, illness, or injury that puts them at risk (SCAN, 2009). This includes review and analysis of medical and diet history, laboratory values, and anthropometric measurements (SCAN, 2009). According to SCAN, based on the assessment and nutrition problem, nutrition strategies most appropriate to manage the condition or treat the illness or injury, while factoring in performance needs, are chosen and include:

- Diet modification and behavioral intervention leading to the development of a personal diet plan to achieve nutritional goals and desired outcomes for health, fitness, and athletic performance
- Specialized nutrition therapy counseling for conditions or special needs, such as: bone mineral disturbance, cardiovascular conditions, diabetes, disabled athletes, disordered eating, female athlete triad, food allergies, gastrointestinal disorders, high blood pressure, iron depletion, and iron-deficiency anemia

Obtaining sports nutrition advice or counseling from an individual who is not nationally accredited bypasses the entire NCP, and may yield unreliable information and undesirable outcomes.

Due to the lack of reliable data for athletes on energy, macronutrient and micronutrient requirements, supplementation, hydration, and other sports nutrition-related topics, nutritional practices of athletes tend to be insufficient to meet their needs (Burns et al, 2004). Sports dietitians could influence athlete's food habits by making available programs on topics of interest such as nutrition for peak performance, weight management, tips on eating out, cooking demonstrations and meal preparation, travel, and grocery store tours (Burns et al. 2004). Sports dietitians are also a vital component of athlete performance and rehabilitation as well as a source of sound advice about food choices and the benefits of good nutrition in their daily lives (Burns et al., 2004). In the opinion of the Collegiate and Professional Sports Dietitian Association (CPSPA), athletes

perform better and are better protected [from unreliable information] with a full-time sports dietitian on staff (CPSPA, 2010). There has yet to be a full-time sports dietitian employed at every university with NCAA teams, and only three dozen full-time sports dietitian positions exist at the Olympic, professional, and military ranks combined (CPSPA, 2010). Therefore, it is crucial that sports dietitians as well as other members of the athletic staff raise awareness on the role, availability, credentialing, and importance of utilizing sports dietitians in the athletic setting.

Roles and Responsibilities of the Certified Specialist in Sports Dietetics

The sports dietitian delivers nutrition information specific to various sports or activities and has a thorough understanding of how energy and nutrient needs change during the various phases of sports and competition (Steinmuller et al., 2009). As nutrition information advances in both quantity and complexity, athletes and active individuals are presented with a myriad of choices and decisions about appropriate and effective nutrition strategies for activity and performance (ADA, DC, ACSM, 2009). Therefore, the ability of the sports dietitian to effectively educate athletes, coaches, athletic trainers, and others regarding compliance with rules and regulation of sports organizations (eg, National Collegiate Athletic Association [NCAA], Major League Baseball [MLB], National Basketball Association [NBA], National Football League [NFL], etc) specific to sports foods, drinks, and dietary supplements is essential (Steinmuller et al., 2009). To integrate nutrition effectively into the athlete's annual

training and competition plan, the sports dietitian works closely with coaches, exercise physiologists, and other members of the multidisciplinary team to assess nutrient needs and develop a plan for the patient or client to meet those nutritional goals with appropriate quantity, quality, and timing of food, fluid, and intake of dietary supplements when appropriate (Steinmuller et al., 2009). The daily schedule demands, environmental factors, and cultural influences should be considered by the sports dietitian (Steinmuller et al., 2009).

According to the “Position Stand on Nutrition and Athletic Performance” by the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine (2009), sports dietitians have several roles and responsibilities in providing effective nutrition care to athletes and active individuals, which include but are not limited to the following:

- Providing education in food selection, purchasing, and preparation
- Provision of medical nutrition therapy
- Identification and treatment of nutritional issues that influence health and performance of athletes and active individuals
- Addressing energy balance and weight management issues
- Addressing nutritional challenges to performance (gastrointestinal disturbances, iron depletion, eating disorders, female athlete triad, food allergies, and supplement use)

- Tracking and documenting measurable outcomes of nutrition services
- Promotion of wound and injury healing
- Oversight of menu planning and design, including pre- and post event and travel
- Development and oversight of nutrition policies and procedures, and
- Evaluation of the scientific literature and provision of evidenced-based assessments and applications

Responsibilities that appear suitable for registered dietitians or CSSDs staffed by athletic departments include individual athlete counseling regarding meal planning, nutrient needs, eating behaviors/concerns, weight loss/gain, diet and body composition analysis, and staff and athlete education about nutrition supplements and other nutrition-related topics (Rockwell et al., 2001). The sports dietitian can also provide assistance in meal planning for training, competition, and on-campus meals (Rockwell et al., 2001). According to the “Position Stand on Nutrition and Athletic Performance” by the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine (2009), additional responsibilities for the qualified sports dietitian include, but are not limited to the following:

- Apply sports nutrition science to fueling fitness and performance
- Develop personalized nutrition and hydration strategies
- Advise on dietary supplements, ergogenic aids, meal and fluid replacement products, sports drinks, bars, and gels

- Evaluate dietary supplements and sports foods for legality, safety, and efficacy
- Provide nutrition strategies to delay fatigue during exercise and speed recovery from training
- Help enhance athletic training capacity and performance
- Participate in identifying and treating disordered eating patterns
- Provide nutrition strategies to reduce risk of illness/injury and facilitate recovery
- Promote career longevity for collegiate and professional athletes and all active individuals
- Recruit and retain clients and athletes in practice
- Provide sports nutrition as a member of multidisciplinary/medical/health care teams
- Provide reimbursable services (diabetes medical nutrition therapy)
- Design and conduct sports team education
- Serve as a mentor for developing sports dietetics professionals, and
- Maintain credential(s) by actively engaging in profession-specific continuing education activities

The sports dietitian must also adhere to standards of practice (SOP) and standards of professional performance (SOPP) for registered dietitians in sports dietetics established by the American Dietetic Association (Steinmuller et al., 2009). Together, the CSSD certification, the sports dietitian job description, and the SOP and SOPP for RDs in sports

dietetics are components of a system that assists sports dietitians in gauging their level of practice and providing a pathway for advancement by defining sports dietetics practices, documenting skill levels, and establishing benchmarks (Steinmuller et al., 2009). The sports dietitian uses the ADA SOP and SOPP to achieve the following:

- Identify competencies needed to provide sports dietetics care
- Self-assess whether they have the appropriate skill and knowledge base to provide safe and effective sports dietetics care for their level of practice
- Identify the areas in which additional knowledge and skills are needed to practice at the generalist, specialty, or advanced level of sports dietetics practice
- Provide a foundation for public and professional accountability in sports dietetics care
- Assist management in the planning of sports dietetics services and resources
- Enhance professional identity and communicate the nature of sports dietetics
- Guide the development of sports dietetics-related education programs, job descriptions, and career pathways, and
- Assist preceptors in teaching students and interns the competencies and skills needed to work in sports dietetics and the understanding of the full scope of this profession

Standards of Practice and Standards of Professional Performance for Sports

Dietitians

The SOP and SOPP for sports dietitians are based on ADA's NCP Model and address the four steps of the NCP and activities related to patient/client care during the NCP (Steinmuller & DiMarco, 2011). Only registered dietitians can implement the nutrition care process (NCP) and perform medical nutrition therapy (ADA, 2010). The NCP is a standardized process for provision of nutrition care and includes four steps:

1. Assessment of nutritional status
2. Identification of nutrition diagnosis (problem)
3. Implementation of relevant interventions
4. Monitoring and evaluation of the nutrition care outcomes

The SOP promote the provision of safe, effective, and efficient food and nutrition services and facilitate evidence-based practice (Steinmuller & DiMarco, 2011).

Additionally, the SOP serve as an evaluation resource, guiding RDs to assess their current level of practice in meeting the standards and determining the requirements for advancement to a higher level of practice (Steinmuller & DiMarco, 2011).

There are different levels of proficiency in sports dietetics practice, which are indicated by the Dreyfus Model (Steinmuller et al., 2009). This model is helpful in understanding the levels of practice described in the SOP and SOPP in sports dietetics;

these stages are represented as generalist, specialty, and advanced practice levels (Steinmuller et al., 2009).

All RDs, even those with significant experience in other practice areas, begin at the novice (generalist) level when practicing in a new setting (Steinmuller et al., 2009). At the novice (generalist) level, the RD in sports dietetics is learning the principles that underpin the practice and is developing skills for effective sports dietetics practice (Steinmuller et al., 2009). At the proficiency (specialty) stage, the RD has developed a deeper understanding of sports dietetics and is much better equipped to apply evidenced-based guidelines and best practices (Steinmuller et al., 2009). The RD is also able to modify practice according to unique situations, such as determining environmental factors such as heat, cold, and altitude in the evaluation of an athlete's energy, fluid, and nutrient needs (Steinmuller et al., 2009). At the expert (advanced) practice level, the RD thinks critically about sports dietetics, demonstrates a more intuitive understanding of sports dietetics care and practice, and displays a range of highly developed clinical and technical skills (which may include but is not limited to performing sports-directed nutrition assessment) and formulates judgments acquired through a combination of experience and education (Steinmuller et al., 2009).

Areas of Practice in Sports Dietetics

Sports dietitians have traditionally worked with elite and recreational athletes who are members of collegiate, club, and professional sports teams, and in settings such as health

clubs, corporate wellness centers, and Olympic training centers (Steinmuller et al, 2009). Employment of registered dietitians as collegiate sports RDs has greatly expanded over 20 years (Steinmuller & DiMarco, 2011). There are more than 20 NCAA Division I institutions that employ at least one full-time sports dietitian and many more colleges and universities employ a sports RD either on a part-time or consultant basis in Division I, II, and III athletic institutions (Steinmuller & DiMarco, 2011). The roles of collegiate RDs typically include functioning as a clinical dietitian, nutrition educator, administrator, and often as a teacher/academician (Steinmuller & DiMarco, 2011).

Progress has been made in sports RD employment by the U.S Olympic Committee (USOC) at its training centers in Colorado Springs, Colorado, and Chula Vista, California (Steinmuller & DiMarco, 2011). Currently, the USOC employs a team of four full-time CSSDs, four consultants, and an Army officer as a fellow (Steinmuller & DiMarco, 2011).

Sports dietitians are also being recruited to work with military, military affiliates, and with occupational groups such as police and fire fighters where human performance as well as physical fitness is required (Steinmuller et al, 2009). Registered dietitians also work in the United States Air Force with airmen in the health and wellness centers (Steinmuller & DiMarco, 2010). Eighteen active duty Army dietitians and two reserve dietitians hold the CSSD credential (Steinmuller & DiMarco, 2011). Although active duty dietitians primarily serve in clinical dietetics and food service positions, they use the

CSSD credential in various ways, from basic sports and nutrition education about supplements to designing individualized programs for soldiers, including competitive athletes, while at their home station and while deployed (Steinmuller & DiMarco, 2011). There are approximately 30 active duty dietitians in the Navy, about 20% of which hold the CSSD certification (Steinmuller & DiMarco, 2011). Navy CSSDs do everything from basic sports and nutrition education about supplements to designing individualized programs for sailors and Marines and their families, as well as retirees, including competitive athletes, while at their home station and while forward deployed (Steinmuller & DiMarco, 2011). The Navy also has four civilian dietitians with the CSSD credential who work with Midshipmen at the Naval Academy special operations units such as Navy SEALs, Explosive Ordnance Disposal units, Individual Augmentees, and the Marine Corps' Performance and Resiliency Program, which focuses on human performance and encompassing physical, mental, and spiritual aspects of healthcare (Steinmuller & DiMarco, 2011). Also, CSSDs in the Navy serve on nutrition and supplement-related committees that address Department of Defense policies, plan and develop nutrition programs and policies affecting the entire Navy, and speak at various fitness-related workshops and seminars (Steinmuller & DiMarco, 2011).

Demand is growing for sports dietitians to be employed in a number of areas, such as private companies specializing in sports performance, by parents for their children's health or sports performance, and to work with athletes who have disabilities and other special needs (Steinmuller et al., 2009). Sports dietitians are also hired as consultants by

researchers to assist in selecting appropriate assessment methods such as dietary intake, nutritional status, energy expenditure, and body composition (Steinmuller et al., 2009).

Sports dietitians are employed in numerous settings where they provide nutrition counseling, assessment, and education to staff members as well as athletes. Other areas of practice in sports dietetics include:

- Athletic performance corporations, sport training and rehab organizations
- Food industry
- Healthcare organizations (hospitals, clinics, eating disorder treatment)
- Media
- Online nutrition coaching
- Police and fire departments
- Professional sports organizations (National Football League, National Basketball Association, Major League Baseball, National Hockey League, etc.)
- Private practice
- Wellness organizations
- Corporate fitness (Steinmuller & DiMarco, 2011)

CHAPTER III

METHODS

Participants

Participants were attendees at the 2010 annual American College of Sports Medicine Conference in Baltimore, MD, who visited the Sports, Cardiovascular, and Wellness Nutrition (SCAN) dietetic practice group booth in the exhibit hall in Baltimore, MD. The number of individuals who visited the SCAN booth is unknown. Participants were asked to fill out a sports nutrition survey. Participation in the survey was optional for attendees and they could choose to decline. Forty-five participants filled out the survey. Informed consent was implied by their decision to participate. Demographic information was not collected from participants. All surveys were completed anonymously. The approximate time to complete the survey was 5 minutes. The Institutional Review Board of Texas Woman's University approved this study (Appendix A)

Survey

The survey consisted of 10 questions, which included queries on understanding of sports nutrition, prevalence and knowledge of referrals to a sports dietitian, understanding of NCAA guidelines regarding sports foods and supplements, sources of nutrition

information, perceived importance of nutrition to performance enhancement, areas of interest among athletes, facility access to a sports dietitian, familiarity with the CSSD credential, and participant occupation. Questions asking participants to rate understanding or perception were based on a 4-point Likert scale model. Descriptive statistics, including frequencies and percentages, were used in the analysis of questions on the survey. A copy of the survey used is included in Appendix B.

CHAPTER IV

RESULTS

The purpose of this study was to determine sports nutrition knowledge, opinions, and practice among the 4,846 attendees of the 2010 American College of Sports Medicine (ACSM) National Conference. This information portrays the results of the 45 surveys collected by the participants. Of the 4,846 attendees, an unknown number of attendees visited the SCAN booth in the exhibit hall of the conference, and 45 visitors consented to fill out the survey. This information could help portray the level of awareness of the sports dietitian and show how often sports dietitians are being used in sports nutrition settings. Descriptive statistics, including frequencies and percentages, were used in the analysis of questions on the survey. The age of the participants was unknown, with participants from a variety of backgrounds and occupations, the majority of which were in exercise-related professions.

In question #1, participants were asked to rate how well they understand sports nutrition. Most participants revealed that their understanding of sports nutrition was good, with 42% of participants choosing this answer. Coming in second, 38% of participants revealed that they had adequate knowledge of sports nutrition. A representation of this data is shown in Figure 1 below.

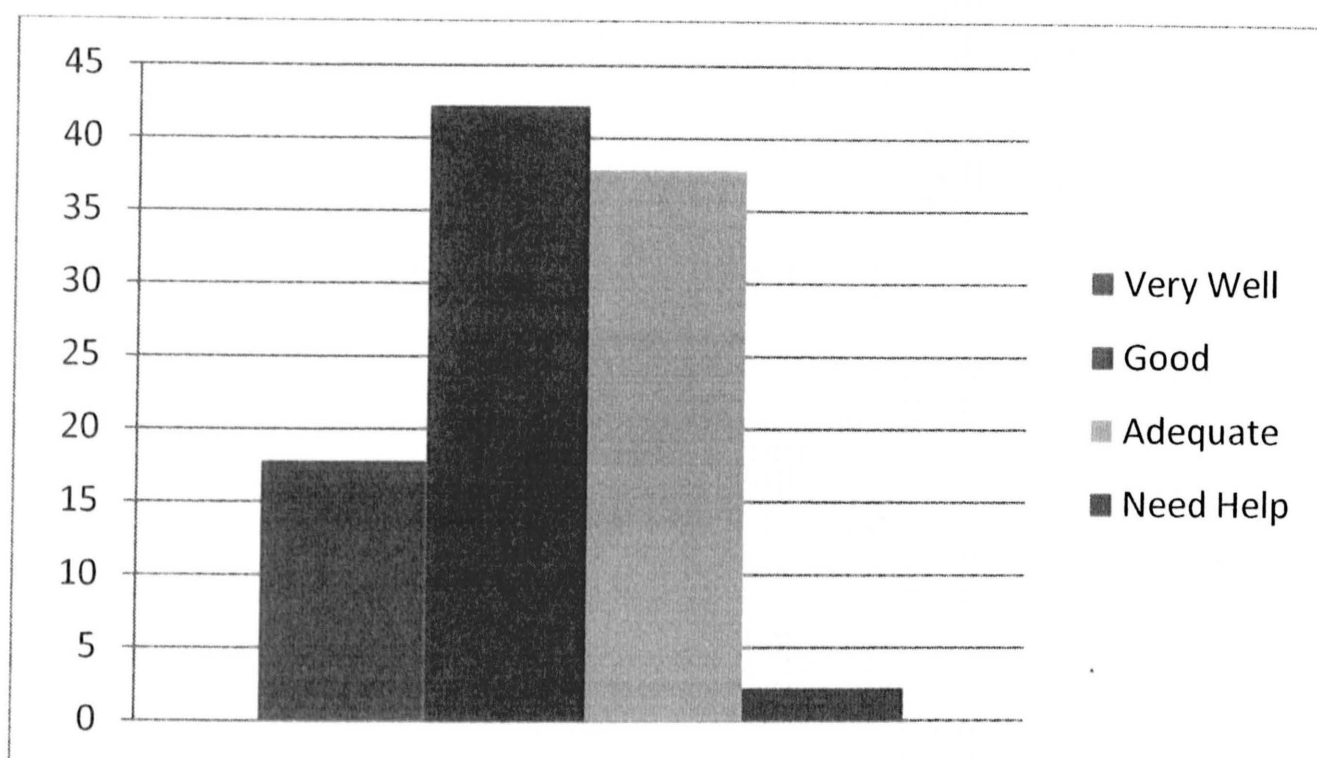


Figure 1: Level of nutrition knowledge among participants

In question #2, participants were asked to rate how often they refer athletes they work with to a sports dietitian for nutrition counseling and to enhance athletic performance. Most people had yet to refer athletes in which they work to a sports dietitian, with this answer occurring 38% of the time. However, it is unknown how many participants work with athletes or are in a position to work with athletes. Participants referred athletes to a sports dietitian very often, 11% of the time, occasionally, 27% of the time, and 16% of participants seldom referred athletes to a sports dietitian. However, in question #3, 53% of participants stated they knew when it was appropriate and how to make a referral to a sports dietitian. Only 9% of participants said that they did not know when it was appropriate or how to make a referral to a sports dietitian, and 33% of participants revealed that they were not sure. Additionally, 4% of participants determined

this answer to be not applicable to them by writing “not applicable” next to the question.

An overview of this data is shown in Figure 2 below.

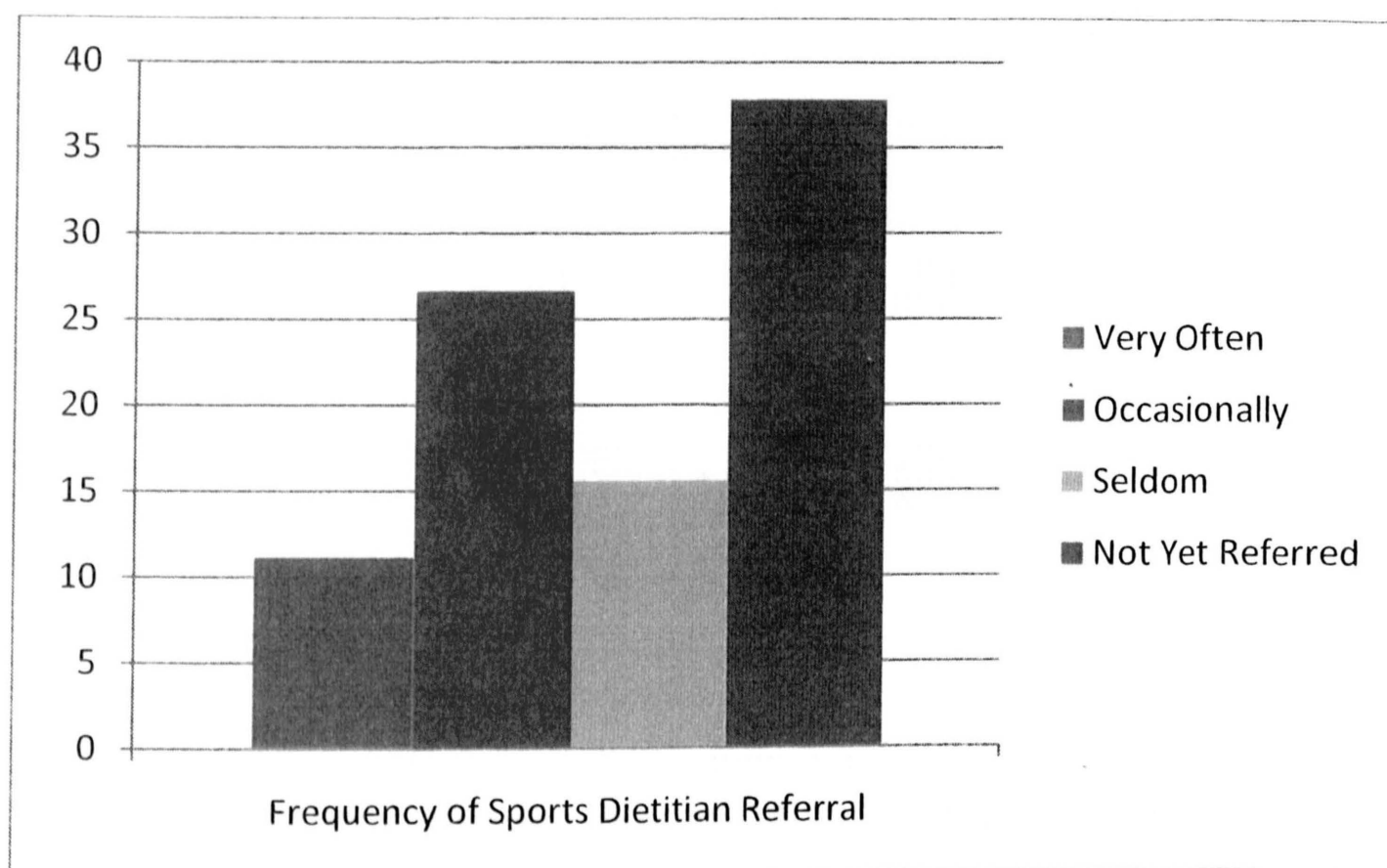


Figure 2: Frequency of sports dietitian referral

In question #4, participants who worked in the college/university setting were asked to rate their understanding of NCAA guidelines regarding sports foods and nutrition supplements. Only 9% of participants felt they had a very good understanding, with 20% having a good understanding, and 18% having an adequate understanding. However, the majority of participants stated that they needed help with their understanding of this subject. This question was not applicable to 9% of the participants surveyed. A representation of this data is shown in Figure 3 below.

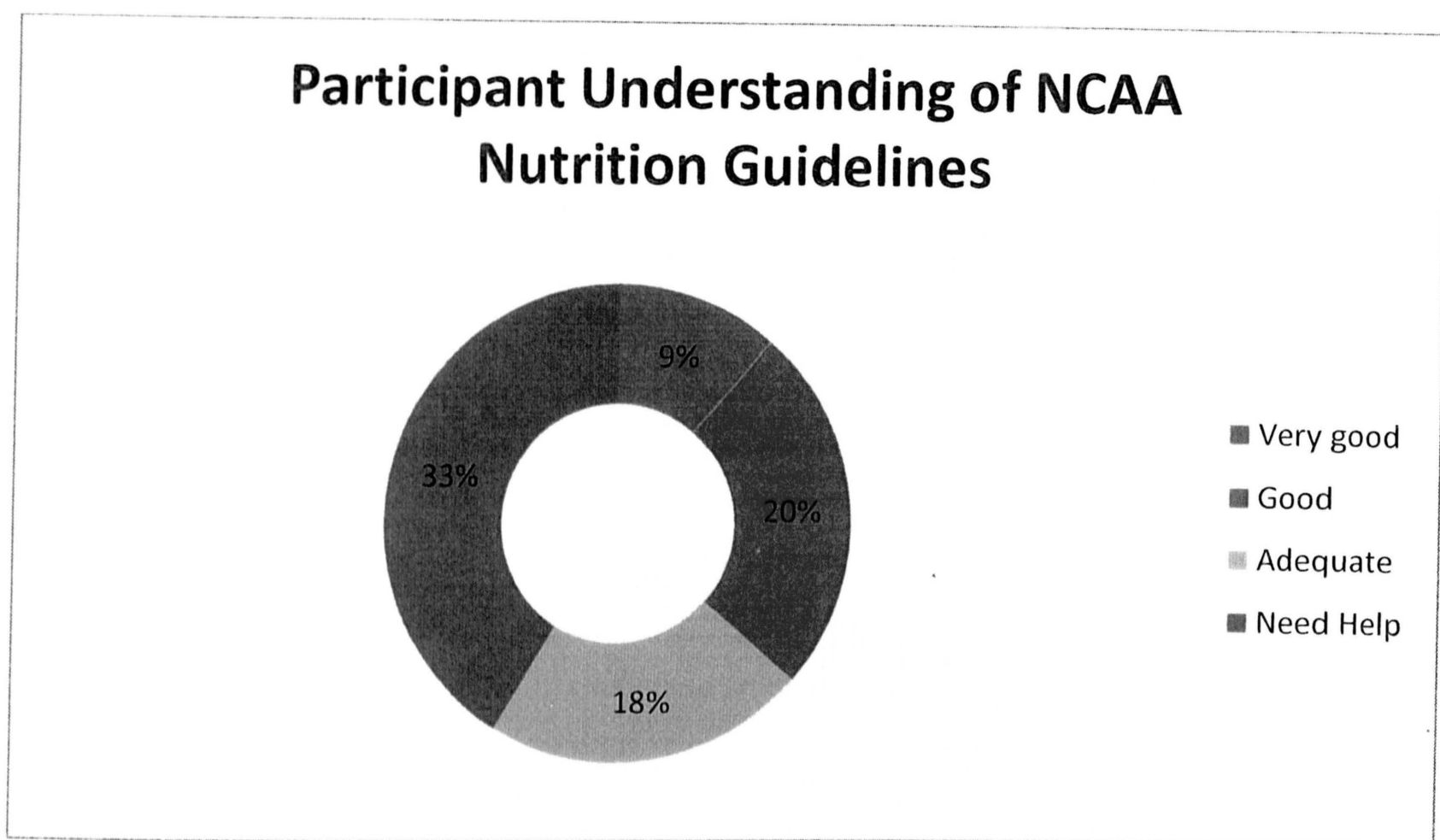


Figure 3: Participant understanding of NCAA nutrition guidelines

Question #5 asked participants to reveal their sources of sports nutrition information. Journal articles were reported as the source most often used to obtain nutrition information, with this source being chosen 60% of the time. Books were reported as a nutrition source 49% of the time, followed closely by sports dietitians who were utilized 47% of the time. Both the internet and workshops/continuing education were used 31% of the time as a nutrition source. Coaches were reported as a nutrition source 4% of the time, making this group the least often used as a source of nutrition information. Athletes, newspapers, and health food stores were each reported as nutrition sources 7% of the time, with athletic trainers being referred to more often at 10% of the time. Magazines were used 24% of the time and physicians 22% of the time. ACSM's

Health and Fitness Summit and Exposition was chosen as a source of nutrition information 13% of the time, and SCAN's website or conference was chosen 11% of the time as a source of nutrition information. A detailed overview of this data is presented in Figure 4 below.

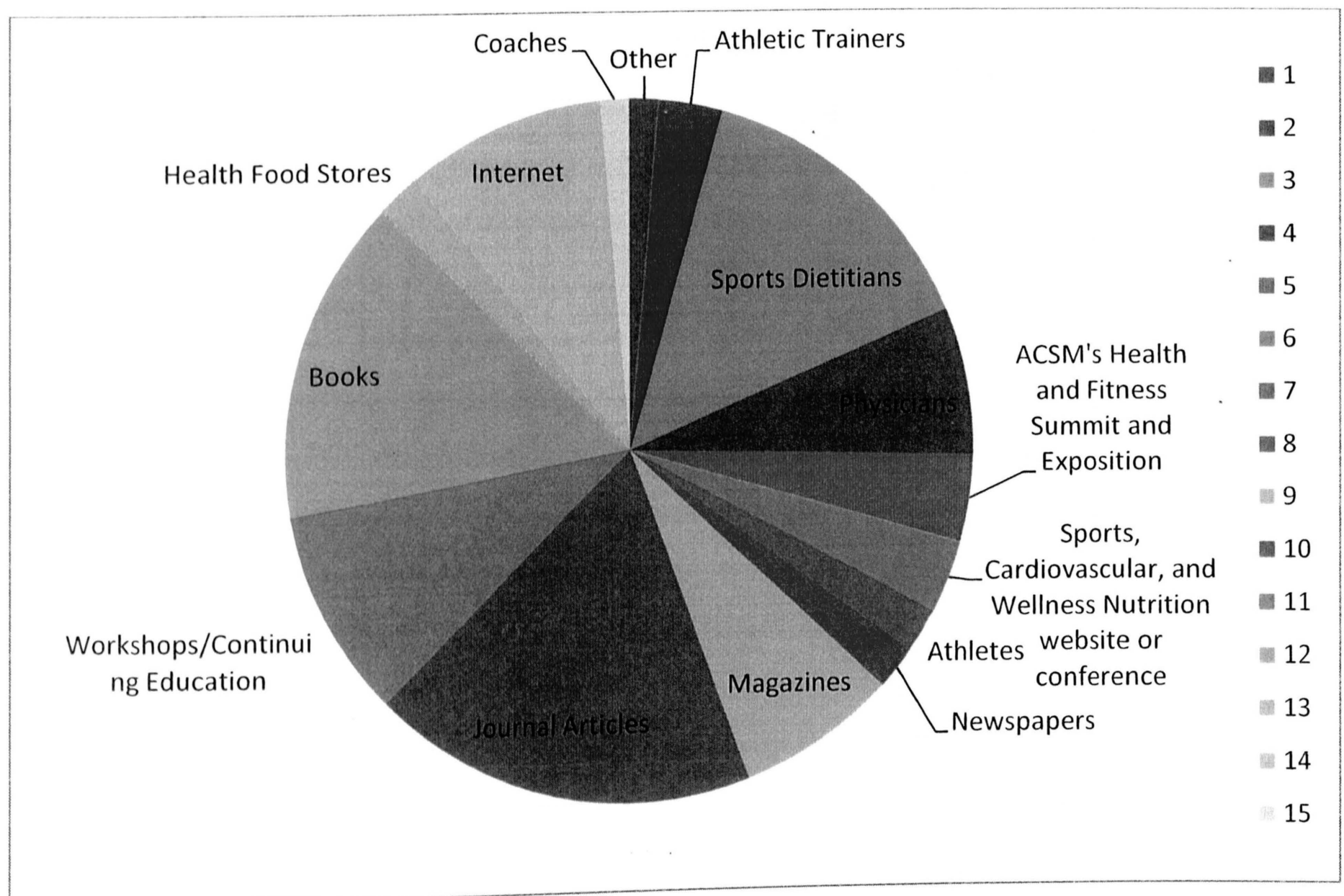


Figure 4: Sources of Sports Nutrition Information

When asked to rate the importance of nutrition to performance enhancement, 84% of participants felt as though nutrition was very important to performance enhancement, whereas only 16% felt as though it was slightly important. No participants felt as though sports nutrition was unimportant to performance enhancement.

The areas in which participants felt athletes wanted to know more about are illustrated in Table 1 below. Pre-exercise nutrition, chosen 64% of the time, was the most frequently chosen topic participants felt athletes wanted to know more about.

Table 1

Topics of Interest Among Athletes

Calorie requirements	47%
Macronutrients (carbohydrates, protein, fat)	27%
Vitamins/Minerals	40%
Pre-exercise nutrition	64%
Nutrition during exercise	42%
Recovery nutrition	44%
Eating during travel	16%
Fluid needs	27%
Sports drinks	38%
Sweat rate calculation	11%
Eating on a budget	24%
Body composition	27%
Weight loss	38%
Weight gain	27%
Disordered eating	20%
Sports snacks and nutritional supplements	38%
Evaluate sports supplements	22%
Quick cooking tips	9%
Meal/snack choices	16%
Food choices	24%
Supermarket shopping	18%
Other	4%

Thirty-seven percent of participants had access to a registered dietitian who specializes in sports nutrition at the facility where they work, whereas 44% of participants did not have access to a registered dietitian who specializes in sports at their place of work. Sixteen percent of participants were unsure whether or not a sports dietitian was available at their place of work, and this question did not apply to 2% of participants. Finally, only 19% of participants were familiar with the Certified Specialist in Sports Dietetics credential, whereas 81% of participants were unfamiliar with this credential.

CHAPTER V

DISCUSSION

The results of this study revealed the sports nutrition knowledge, opinions, and practices among attendees of the 2010 American College of Sports Medicine (ACSM) National Conference. Participants were from a variety of backgrounds and occupations. The age of the participants was unknown and participants were from a variety of exercise-related professions. This data provided better insight into people's perception of sports dietitians as the expert in the field of sports nutrition.

Sports Nutrition and Sports Dietitian Knowledge, Opinions, and Practices

Only 18% of participants felt as though they understood sports nutrition “very well”, yet only referred athletes with whom they work to a sports dietitian for nutrition counsel to enhance athletic performance 11% of the time. Furthermore, over half of participants reported that they knew how to make a referral to a sports dietitian. This data illustrates how the practice of utilizing sports dietitians is not common practice in athletics. CSSDs can be marketed as the premier sports nutrition professionals in the United States because sports dietitians to provide safe, effective, evidence-based nutrition assessment, guidance, and counseling for health and performance for athletes, sports organizations, and physically active individuals and groups (American Dietetic Association [ADA], Dietitians of Canada [DOC], and the American College of Sports

Medicine [ACSM], 2009). However, they are not recognized as so perhaps due to the lack of availability of sports dietitians to athletes or the lack of funding to employ sports dietitians in sports settings. Every CSSD in the United States has yet to be employed full-time in organizational athletic settings such as the NCAA. Of the 1091 NCAA schools, approximately 20 employ a full-time sports dietitian, all of which are at the Division I level (Steinmuller and DiMarco, 2011). Approximately three dozen sports dietitian positions exist at the Olympic, professional, and military ranks combined (CPSPA, 2010). Hence, it is crucial that sports dietitians and CSSDs as well as other members of athletic staffs raise awareness on the role, availability, credentialing, and importance of utilizing sports dietitians in the athletic setting.

The college/university setting is an area where sports dietitians are under-utilized, which was shown in a study in 2001 by Rockwell et al., and again in 2004 by Burns et al. Participants in this study who work in the college/university setting were asked to rate their understanding of the NCAA guidelines regarding sports foods and nutritional supplements. Only 9% of respondents felt as though they understood this topic “very well”, with the majority of participants responding that they “need help”. When asked for sources in which participants obtained sports nutrition information, sports dietitians were utilized most often, with participants referring to sports dietitians 47% of the time. In 2001, Rockwell et al. performed a similar study in which intercollegiate athletes were asked to report their primary sources of nutrition information. However, Rockwell et al. found that magazines were the primary nutrition source among coaches and athletic

trainers at Division I institutions. According to a study performed by Burns et al., athletes tended to use athletic trainers as their primary source of nutrition information, even though dietitians were available in about half of the athletic departments. Eighty-four percent of participants in this study indicated that sports nutrition was very important to performance enhancement, which may signify the increase in the use of sports dietitians as a primary nutrition source. Greater awareness of sports dietitians and CSSD credentials and qualifications could lead to a perception of the dietitian as the premier provider of nutrition service and increased utilization of CSSDs in athletic settings.

The sports dietitian is a vital component of the athletes' performance as well as a source of sound advice about food choices and the benefit of nutrition in their daily lives (Burns et al., 2004). Proper nutrition for athletes is critical not only to athletic success, but to growth, development, and overall health, and the CSSD can facilitate success in all of these areas.

Sports Dietitian Awareness

Of the participants surveyed, 19% of participants were aware of the Certified Specialist in Sports Dietetics (CSSD) credential. This shows that participants in this study are not aware of the the CSSD credential and qualification in sports nutrition. This could be due to the fact that ACSM does not primarily attract people in nutrition-related professions who work directly with athletes. Increasing the awareness of the CSSD will increase sports dietitian awareness and utilization, which in turn may increase CSSD

utilization and the number of athletes who are provided with evidence-based nutrition care. In the opinion of the CPSDA, athletes perform better and are better protected with a full-time sports dietitian on staff. It is important to increase awareness of sports dietitians because they deliver nutrition information specific to various sports or activities and have a thorough understanding of how energy and nutrient needs change during the various phases of sports and competition (Steinmuller et al., 2009). If athletes are not provided with ample reliable nutrition resources, they may continue to refer to sources other than the sports dietitian.

Summary

Based on previous research and the current data, it can be concluded that:

1. Sports dietitians are the most frequently utilized nutrition source among attendees of the 2010 ACSM National Conference.
2. Only 19% of attendees are aware of the Certified Specialist in Sports Dietetics credential.
3. Sports dietitians and CSSDs should continue to market themselves as the premier professional in sports nutrition to increase awareness and utilization.

Limitations/Suggestions for Future Research

It is recommended that more research on sports dietitians in the United States be conducted to promote awareness and increase utilization in all areas of sports nutrition. There is little research in the United States providing information on CSSDs and their

importance and role in athletics. Although this study explored this topic, there were some limitations. Because this data was collected at an annual ACSM conference, this study may not generalize to the general population. ACSM members are typically not in nutrition-related professions and most do not work directly with athletes. Perhaps an organization to consider surveying in the future would be the National Athletic Trainer's Association because of their direct relationship to athletes. Also, demographic information on participants was unknown. Because there is so little research performed on this topic, there is a limited amount of data in which to compare this research. The majority of the information in this study came from the American Dietetic Association and the Sports, Cardiovascular, and Wellness Nutrition dietetic practice group. Therefore, there is a potential for this information to be biased.

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APPENDIX A
INSTITUTIONAL REVIEW BOARD APPROVAL



Institutional Review Board

Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
e-mail: IRB@twu.edu

December 9, 2010

Ms. Nakia Westbrook
3575 Quail Creek Dr. #3302
Denton, TX 76208

Dear Ms. Westbrook:

Re: The Awareness and Role of Sports Dietitians in the United States (Protocol #: 16337)

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and was determined to be exempt from further review.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. Because a signed consent form is not required for exempt studies, the filing of signatures of participants with the TWU IRB is not necessary.

Any modifications to this study must be submitted for review to the IRB using the Modification Request Form. Additionally, the IRB must be notified immediately of any unanticipated incidents. If you have any questions, please contact the TWU IRB.

Sincerely,

Dr. Kathy DeOrnellas, Chair
Institutional Review Board - Denton

cc. Dr. Chandan Prasad, Department of Nutrition & Food Sciences
Dr. Nancy DiMarco, Department of Nutrition & Food Sciences
Graduate School

APPENDIX B
PARTICIPANT SURVEY

Sports Nutrition Survey – ACSM Annual Meeting June 1-5, 2010

*Check the answer that best represents you.
The return of your completed questionnaire constitutes your informed consent to act as a
participant in this research*

1. Rate how well you understand sports nutrition.

☐ Very well ☐ Good ☐ Adequate ☐ Need help

2. Rate how often you refer athletes with whom you work to a sports dietitian for nutrition counsel to enhance athletic performance.

☐ Very often ☐ Occasionally ☐ Seldom ☐ Not yet referred

3. Do you know when it is appropriate and how to make a referral to a sports dietitian?

☐ Yes ☐ No ☐ Not sure

4. For those of you working in the college/university setting, rate your understanding of the NCAA guidelines regarding sports foods and nutritional supplements.

☐ Very good ☐ Good ☐ Adequate ☐ Need help

5. Where do you obtain sports nutrition information? Check all that apply.

<input type="checkbox"/> Coaches	<input type="checkbox"/> Athletes	<input type="checkbox"/> Internet
<input type="checkbox"/> Athletic Trainers	<input type="checkbox"/> Newspapers	<input type="checkbox"/> Books
<input type="checkbox"/> Sports Dietitians	<input type="checkbox"/> Magazines	<input type="checkbox"/> Health food stores
<input type="checkbox"/> Physicians	<input type="checkbox"/> Journal articles	<input type="checkbox"/> Workshops / Continuing

Education

☐ ACSM's Health & Fitness Summit & Exposition ☐ Other (specify): _____

☐ Sports, Cardiovascular and Wellness Nutrition (SCAN) website or conference

6. Rate the importance of nutrition to performance enhancement.

☐ Very important ☐ Somewhat important ☐ Slightly important ☐ Not important

7. In what areas of sports nutrition do athletes with whom you work want to know more? Check all that apply.

<input type="checkbox"/> Calorie Requirements	<input type="checkbox"/> Body composition
<input type="checkbox"/> Macronutrients (protein, carbs, fat)	<input type="checkbox"/> Weight loss
<input type="checkbox"/> Vitamins/minerals	<input type="checkbox"/> Weight gain
<input type="checkbox"/> Pre-exercise nutrition	<input type="checkbox"/> Disordered eating (signs, prevention, treatment)
<input type="checkbox"/> Nutrition during exercise	<input type="checkbox"/> Sports snacks and nutritional

supplements

<input type="checkbox"/> Recovery nutrition	<input type="checkbox"/> Evaluate sports supplements
<input type="checkbox"/> Eating while traveling	<input type="checkbox"/> Quick cooking tips
<input type="checkbox"/> Fluid needs	<input type="checkbox"/> Meal/snack choices
<input type="checkbox"/> Sports drinks	<input type="checkbox"/> Food choices (dorm, fast foods, grocery store, restaurants)
<input type="checkbox"/> Sweat rate calculation	<input type="checkbox"/> Supermarket Shopping
<input type="checkbox"/> Eating on a budget	

____ Other (specify) _____

8. Do you and the facility where you work have access to a Registered Dietitian who specializes in sports?

____ Yes ____ No ____ Not Sure

9. Are you familiar with the Board Certified Specialist in Sports Dietetics (CSSD) credential? ____ Yes

____ No

10. What Is your occupation? _____

Thank you for participating in this survey.