

ABSTRACT

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This study looked at the perception of athletic training education by certified athletic trainers (ATCs) who work with disability sports. A questionnaire was used to gather information about how prepared ATCs felt using skills that might be needed if they provided medical coverage for athletes with disabilities. Surveys were sent to ATCs who were identified by the medical director of the United States Olympic Committee (USOC) as having work experience with disability sports. Each survey asked subjects to rate on a scale of 1 to 5, with 1 representing "strongly disagree" and 5 representing "strongly agree", how their educational experience prepared them for thirty different skills that they may need if they were working with athletes with disabilities. Nineteen respondents completed the survey. Overall, the subjects did not feel prepared to work with athletes with disabilities. Overall, ATCs averaged 2.60 on the complete list of skills that they could potentially be asked to perform. In addition, those skills that were universal to all athletes were perceived as being better prepared for than those that were specific to athletes with disabilities. ANOVA was used to determine if demographics was a factor on how ATCs perceived their education. No main effects were found in the results concerning gender, past Paralympic experience, and type of athletic training program and the perception of education. There was a mild correlation between the length of time one was certified as an ATC, and his/her perception of their education. Further investigations on athletic training within disability sports are needed to determine the educational needs for student athletic trainers.

**PERCEPTION OF ATHLETIC TRAINING EDUCATION
BY CERTIFIED ATHLETIC TRAINERS
WHO WORK WITH DISABILITY SPORTS**

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CHAPTER I

INTRODUCTION

Background

Disability sport opportunities have expanded since the end of World War II, when Stoke Mandeville Hospital in England began modifying existing sports and creating new ones to use as rehabilitation for injured veterans (Ferrara & Palutsis, 1999). Disability Sport organizations, such as the Dwarf Athletic Association of America (DAAA) and the United States of America Deaf Sports Foundation (USADSF), have since been formed to meet the increasing needs of athletes with disabilities. With a greater number of participants also came the need for additional coaches, and not so obvious, more athletic trainers.

Little research has been done on athletes with disabilities in comparison to athletes without disabilities. In addition, virtually no research has been done with the certified athletic trainers (ATCs) that work with disability sports. This leaves several questions unanswered, including whether or not these ATCs have specific educational backgrounds to work with athletes who are disabled. Studies have suggested that some athletes with disabilities respond to exercise differently than others, and that these responses are very specific to their disability (Moorcroft, Dodd, & Webb, 1998; Peck & McKeag, 1994). It was, therefore, necessary to investigate the extent of education that ATCs have in regards to athletes with disabilities and the injuries specific to each disability.

In the United States, students in undergraduate athletic training programs are required to complete competencies, which include gaining clinical experiences with athletes. Furthermore, they are required to gain experience with contact sports, such as hockey and football, and also with non-contact sports, such as gymnastics and crew. Thus far, there are no requirements in terms of gaining clinical experience with athletes with disabilities. With the growing number of disability sport opportunities, there will be a greater need for ATCs to serve these athletes. However, with no requirements in this area, it will be difficult to fill these positions with qualified athletic trainers.

This study was necessary because it gives an indication of whether or not the ATCs working with disability sport organizations felt that they were adequately educated to work with this patient population. The information discovered in this study could then be relayed to educational programs and professional organizations, such as the National Athletic Trainers' Association, so that they may consider a need for additional educational competencies for student athletic trainers.

Purpose of the Study

This study had two primary purposes. The first was to examine perceptions of ATCs working with disability sports concerning their educational preparation to work with athletes with disabilities. The other primary purpose of the study was to determine what skills this group of ATCs believe should be included in an undergraduate athletic training curriculum. A secondary purpose was to investigate the educational and clinical background of ATCs working with disability sports.

Hypotheses

Two main hypotheses were examined in this study. The first hypothesis was that, ATCs would not feel that their undergraduate education prepared them for working with athletes with disabilities. Second, it was also hypothesized that the longer someone has been certified as an athletic trainer, the less he/she will have felt prepared by his/her undergraduate education.

Definition of Terms

Certified athletic trainer (ATC) - any individual certified by the National Athletic Trainers' Association (NATA) Board of Certification.

Competencies - "a set of expected outcomes of students who complete a CAAHEP-accredited athletic training program" (NATA Education Council, 1999).

Clinical Proficiencies - common set of skills in which entry level athletic trainers should be knowledgeable (NATA Education Council, 1999).

Disability - "mental retardation, hearing impairments including deafness, speech or language impairments, visual impairments including blindness, serious emotional disturbance, orthopedic impairments, autism, traumatic brain injury, or other health impairments, or specific learning disabilities" (Individuals with Disabilities Education Act [IDEA], PL 101-476, Sec. 1401a).

Disabled Sport Organizations (DSOs) - seven USOC-affiliated organizations, which serve to provide athletic opportunities to individuals with disabilities. The organizations include the American Athletic Association for the Deaf (AAAD), National Wheelchair Athletic Association (NWAA), Disabled Sports of the United States of America

(DSUSA), Dwarf Athletic Association of America (DAAA), U.S. Association for Blind Athletes (USABA), United States Cerebral Palsy Athletic Association (USCPAA), and Special Olympics International (SOI).

Joint Review Committee on Athletic Training (JRC-AT) - "a branch of CAAHEP [Commission on Accreditation of Allied Health Education Programs] that is responsible for establishing the Standards and Guidelines (Standards) for entry-level athletic training education programs" (Starkey, 2001, p. 46).

National Athletic Trainers' Association, Inc. (NATA) - "a member-based trade association that strives to enhance the quality of health care delivered by certified athletic trainers" (Starkey, 2001, p. 46).

National Athletic Trainers' Association Board of Certification, Inc. (NATABOC) - the professional organization which nationally certifies individuals to work as athletic trainers.

Paralympics - the international games for athletes with disabilities, equivalent to the Olympic games. The Paralympics are held every four years in conjunction with the Olympic games.

CHAPTER II
REVIEW OF RELATED LITERATURE

Introduction

The purpose of this section is to describe results of previous studies done with athletes with disabilities. Related literature and background information concerning sport medicine and disability sport organizations is also presented.

Participation in Disability Sports

Since World War II, participation by athletes with disabilities in sport competitions has increased dramatically. Disabled sports began at Stoke Mandeville Hospital in Aylesbury, England as rehabilitation for war veterans injured in battle (Ferrara & Palutsis, 1999). The theory behind using sports as rehabilitation was that it would provide an interesting means to regaining strength and flexibility. For example, weight lifting and archery were two sports used to help strengthen the arm muscles of paraplegic patients, enabling them to gain independence in their activities of daily living (ADLs) (Chawla, 1994).

Since 1944, legislation has allowed for more equality for participation in athletics by those with disabilities. The reauthorization of Section 504 of the Federal Rehabilitation Act of 1973 provided legal means for challenging medical sports participation decisions. This meant that athletes who had been told by a physician that they were not allowed to participate in sports due to a medical condition or disability had the legal right to challenge that decision (Nichols, 1996). In addition, this prevented federally funded

programs from excluding athletes solely based on their disability, instead of considering their qualifications. In 1979, the Committee on Sports for the Disabled was formed as a part of the United States Olympic Committee (USOC) (Ferrara, Buckley, Messner, & Benedict, 1992). The Americans With Disabilities Act (PL 101-336) of 1990 (ADA) further protected persons with disabilities from discrimination in areas such as public accommodations and transportation. The Olympic and Amateur Sports Act of 1998 also directed the USOC to:

encourage and provide assistance to amateur athletic programs and competition for handicapped individuals, including, where feasible, the expansion of opportunities for meaningful participation by handicapped individuals in programs of athletic competition for able-bodied individuals" (Bazylewicz, et. al, 1999).

According to Ferrara and Palutis (1999), the Paralympics, the equivalent of the Olympic games for athletes with physical and sensory disabilities, has increased tenfold since its beginning in 1960. Today, an estimated 2-3 million athletes with physical and mental disabilities are involved annually in competition in the United States (Ferrara, et al., 1992). Consequently, seven DSO's under the jurisdiction of the USOC have been formed for this competitive and training purpose. These DSOs include DSUSA, DAAA, USABA, USCPAA, WSUSA, SOI, and AAAD.

Injuries to Athletes with Disabilities

A few studies have shown that, in general, athletes with disabilities have similar injury patterns to athletes without disabilities (Ferrara, Buckley, & Peterson, 1997; Ferrara & Palutis, 1999). However, it is important to note that research with this population has been limited by poor injury definition, short reporting time periods, and samples of

convenience (Ferrara, Palutis, Snouse, & Davis, 2000). The Athletes with Disabilities Injury Report (ADIR) conducted by Dr. Michael Ferrara found that over a three-year period, athletes with disabilities reported 9.45 injuries per 1000 athletic exposures. Fifty-two percent of those injuries were minor (0-7 days time loss), 29% were moderate (8-21 days time loss), and 19% were major (22 or more days time loss) (Ferrara & Palutis, 1999; Ferrara, et al., 1997). In comparison, during the 1988 Paralympics, 60% of athletes with cerebral palsy reported an injury, while 75% of the Olympic athletes reported injuries that same year (Peck & McKeag, 1994). In another study conducted by Ferrara, et al. (1991), 32% of athletes participating at the national games for the National Wheelchair Athletic Association (NWAA), USABA, and USCPAA reported one or more injuries during the study period. Of the three organizations, the USABA reported the most injuries per athlete. It has also been shown that although injury patterns were similar between disabled and non-disabled athletic populations, time loss from activity was greater for those athletes with a disability (Ferrara, et al., 1997).

Injuries Specific to Athletes with Disabilities

As with any sport, there are certain injuries that are more common in certain disability sports, and to certain athletes. Wheelchair athletes, in general, experience similar injuries due to their ambulatory restrictions. For example, those athletes in wheelchairs are more prone to abrasions and blisters on their hands because of the nature of their sport. In addition, overuse injuries, such as carpal tunnel syndrome and rotator cuff tendonitis are common because of the repetitive motion used in wheelchair propulsion. This repetitive motion may also cause a loss of flexibility to the anterior shoulder musculature (Ferrara,

et al., 1991). Pressure sores and hip flexion contractions are often seen in those athletes who sit in their wheelchairs for a prolonged period of time. Some athletes who have multiple sclerosis or spinal cord injuries are unable to control their core body temperature due to lack of thermoregulatory control, and are unable to tolerate temperature extremes (Peck & McKeag, 1994; Ferrara & Palutsis, 1999). This same group of athletes may also experience a neurogenic bladder, where the bladder does not empty completely or properly. This ultimately leads to increased chance of bladder infections (Curtis, 1997). Autonomic dysreflexia is a potentially life-threatening condition, which may affect wheelchair athletes. Symptoms include sweating, goosebumps, headaches, and it is generally characterized by high blood pressure and low heart rate. This is contradictory to the usual high heart rate that is seen in wheelchair athletes due to less venous return from the lower extremities. Autonomic dysreflexia is generally caused by a distended colon or bladder. In some cases, elite athletes may induce this condition to maximize their blood circulation (Sherrill, 1993). Autonomic dysreflexia is a life-threatening condition, and the medical staff that works with these athletes needs to be aware of and able to recognize the symptoms as such.

Although polio has not been commonly seen in recent years, those athletes who once had polio have a higher risk of developing post polio syndrome due to muscle overuse (Jacob & Hutzler, 1998). This becomes a concern in sports such as rowing, running, and softball, where overuse injuries are common.

Athletes with visual impairments stand a greater risk of lower extremity injuries than injuries to the upper extremity. This is caused by the greater lack of visual cues to avoid

potentially harmful situations. As a result, sprains, contusions, and abrasions to the feet, ankles, and knees are commonly seen. In addition to acute injuries, athletes with visual impairments may expend more energy than other athletes when performing the same tasks. This could lead to increased fatigue, which has been found to be a factor in chronic injuries (Ferrara, et al., 1997). Finally, those with visual impairments caused by albinism are more apt to sunburn, and therefore, require additional protection from the sun (Ferrara & Palutsis, 1999).

Special Olympics is an organization designed for competitions between athletes with mental retardation and Down syndrome. It is important to realize that 50% of individuals with Down syndrome have congenital heart defects. In addition, this population frequently experiences joint laxity and atlanto-axial subluxation, in which the first cervical vertebrae slips forward onto the second vertebrae (Ferrara & Palutsis, 1999). According to Stopka (1996), Robson reported that in the 1989 Special Olympic games in the United Kingdom, 7.1% of the competitors demonstrated atlanto-axial instability. Special consideration should be taken with those athletes who participate in activities like gymnastics and wrestling. Special Olympics athletes are also prone to subluxations and dislocations of the patellae, and may have increased incidence of pes planus, hallux valgus, metatarsus primus varus, and thoracolumbar scoliosis.

Athletes with amputations also have common injuries specific to their disability. Swelling of the residual limb can occur from increased use. Abrasions and blistering to the residual limb are also commonly seen (Ferrara & Palutsis, 1999). Special prostheses may be recommended for athletic participation.

Disability Sports and Athletic Training

Athletes with disabilities are more susceptible to certain injuries because of the demand of their sports in addition to their ADLs. In addition, there are fewer choices available for alternative exercises for athletes with disabilities while they are undergoing rehabilitation for an injury. The skills of an athletic trainer include prevention, treatment, and rehabilitation of athletic-related injuries. In a study done by Ferrara, et al., (1997) 15% of the moderate and major injuries were not evaluated medically, which raises the issue of access to appropriate medical care for sport-related injuries. In a separate study done by Ferrara, et al. (1992), 18.8% of the athletes with disabilities reported their sports-related injuries to an athletic trainer, while 6.8% of the injuries were reported to a physical therapist, and 45.5% to a physician. Limited information is available on the relationship between ATCs and their involvement in disability sports.

The JRC-AT published a handbook of Athletic Training Educational Competencies in 1999. Students preparing for the National Athletic Trainers' Association Board of Certification (NATABOC) examination are supposed to be knowledgeable in these educational competencies. These skills are based on role delineation studies done with current certified athletic trainers, and are aimed to prepare the entry-level ATC for current practices. In the list of hundreds of clinical proficiencies, approximately sixteen of them deal with disability sport issues, most of them indirectly. Only one competency mentions the word "disability" directly. It states that athletic trainers should be able to, "[Describe] congenital or acquired abnormalities, physical disabilities, and diseases" (p. 51). The other 15 proficiencies describe particular conditions, such as diabetes, seizures,

asthma, and "conditions that affect bones and joints" (p. 52), but none of them discusses specific disabilities that are part of the DSOs. In other words, the JRC-AT has not required preparation of their students in working with athletes with disabilities, even though the number of these athletes is constantly increasing.

It is also within the realm of an athletic trainer's duties to be aware of the types of protective equipment available to athletes with disabilities. Athletes in wheelchairs, especially, should be equipped with workout gloves with proper padding, helmets, and spoke/finger protectors. As an athletic trainer should know how to properly fit football helmets and shoulder pads, they should also be knowledgeable on the protective equipment for disability sports.

Pharmacology is, in fact, one of the competency areas for the accredited athletic training programs. It is very possible that athletes may be taking medications for control of their disability or medical condition. It is within the realm of the athletic trainer to know what is banned versus legal for athletic participation. In addition, drug interactions may be an issue in disability sports. For example, some drugs may cause dizziness, vomiting, or fatigue, and the ATC should be aware of common drugs and their side effects.

Rankin (1989) found that the average rate of injury without a full-time ATC was 50%, compared to an injury rate of 29% with a full-time ATC. These figures suggest that the presence of a full-time athletic trainer might help reduce the number of injuries experienced by the athletes. Although this study was conducted with athletes without disabilities, it is possible that the same is true for those individuals with disabilities.

Summary

Although very little to no research exists that is concerned with the education of athletic trainers who work with athletes with disabilities, research does exist that confirms that some athletes, even if only a small percentage, are reporting their injuries to ATCs. Many similarities between injury patterns of disabled and able-bodied athletes exist; however, it is important to remember the differences in their ADLs. With the increase in disability sports comes an increase in participants requiring medical care. In many instances, the ATC could be the first to respond to that need, but only with the proper education.

CHAPTER III

METHODS AND PROCEDURES

Introduction

Every four years, the United States Olympic Committee (USOC) recruits individuals to volunteer at the Paralympics immediately following the Olympic Games. It is unclear, however, how much education and experience these individuals, including ATCs, have working with athletes with disabilities and how prepared their education has made them. In order to determine the extent of education that certified athletic trainers have and their perception on preparedness in working with disability sports, a survey was distributed to a group of subjects who work with athletes with disabilities.

Pilot Study

A pilot study was conducted with a group of ATCs from a local sports medicine clinic who did not necessarily work with athletes with disabilities. The purpose of this pilot was to test wording and comprehension of the questions contained in the survey. Only minor changes were made before the survey was distributed to the subjects.

Subject Selection

Efforts were made to recruit subjects from both the NATA and the DSOs; however neither of these organizations had lists of ATCs who worked with disability sports. Therefore, subjects were only chosen from a list of ATCs provided by the USOC. Only athletic trainers who are certified by the National Athletic Trainers' Association Board of Certification (NATABOC) were invited to participate in the study. Packets

containing questionnaires (see Appendix A) were mailed directly to the USOC, who then distributed them to the ATCs. Forty-four subjects were chosen to participate in the research; however only forty received the questionnaires because of concerns with forwarding addresses.

Instrumentation

A questionnaire was developed focusing on the individual's educational and clinical backgrounds in disabilities. In addition, the subjects were asked a series of questions to determine how they felt their education prepared them for dealing with situations that could occur in disability sports. The final section of the survey contained open-ended questions, which asked ATCs to explain situations in which they felt unprepared. It also asked subjects to comment on areas in which athletic training educational programs could be improved.

Questionnaire Administration

Questionnaires were mailed to each subjects along with a cover letter (see Appendix B) and a self-addressed stamped envelope via the USOC. A response time of two weeks was requested for completion of the survey. Assumption of informed consent was taken with the completion and return of each survey. After three weeks, a follow-up e-mail message was sent by the medical director of the USOC reminding individuals to return their surveys and providing information to obtain a second survey packet. Two weeks after the reminder, the analysis on the data was commenced.

Statistical Treatment

Once the data were collected, it was analyzed using the SPSS statistical program to find relationships between the way the certified athletic trainers feel about their education and the number of years they have been working with disability sports. In addition, mean scores were determined on individual items among the entire group, and for each individual's separate surveys. These scores were used to determine areas of athletic training for which the subjects felt better preparation were needed.

CHAPTER IV

RESULTS AND DISCUSSION

Subjects

Forty-four surveys were sent out by the Medical Director at the USOC. Of those, four were returned to the sender with no forwarding address. Nineteen of forty questionnaires that were received by the subjects were returned for a response rate of 47.5%. Eleven females (58%) and eight males (42%) represented the nineteen responses. The mean age of the subjects was 38.0 +/- 5.9 years.

Forty-two percent of subjects (n = 8) received their athletic training education through an internship program, while 58% (n = 11) matriculated through a curriculum educational program. Thirteen of the nineteen respondents had additional credentials to their athletic training certification. Four of these thirteen were physical therapists. A majority of the subjects (n = 16) had advanced degrees, and five of these were in athletic training, physical therapy, or sports medicine related areas.

Most respondents (n = 14) had 11 or more years of experience as an athletic trainer, while five had between 1 and 10 years of experience as an ATC. A majority (n = 11) of the subjects had five years or less experience working as ATCs with disability sports. Six (32%) of the subjects had less than one year of experience with this population. While eleven (58%) of the ATCs worked as volunteers with disability sports, eight were employed part-time, and five of those eight were employed by the USOC. All

of the subjects (100%) worked five hours or less per week with athletes with disabilities. Almost 79% of the subjects ($n = 15$) had volunteered with the Paralympics in the past.

Survey Results

Disability-specific skills and Perception of Education

The results of this study showed that on a scale of 1 through 5, with 1 representing "strongly disagree" and 5 representing "strongly agree," subjects averaged a score of 2.60, indicating how well their education prepared them to work with athletes with disabilities. More specifically, ATCs scored an average of 2.01 on skills that are disability-specific, while scoring 3.68 on skills that are used with both disabled and non-disabled athletes. An example of a disability-specific skill would be treating autonomic dysreflexia, which is particular to athletes who use wheelchairs, while a more universal skill would be recognizing and treating rotator cuff tendonitis, which is common in both athletes with and without disabilities. Figure 1 depicts the average score on each disability-specific item, while Figure 2 shows the results for the skill areas that are not limited to those who work with athletes with disabilities. A paired sample t-test was used to compare the overall average between Figure 1 and Figure 2. Results showed that there was a significant difference ($p > .05$) between the skills specific to disabilities in comparison to those skills that are not specific to disabilities.

Perception of Education and Demographics

The subjects were asked a series of questions in which they rated on a Likert-type scale of 1 to 5 (1 being least prepared) of how prepared they felt to perform skills that

My educational experience prepared me:	Mean	S.D.
To prevent and recognize autonomic dysreflexia	1.29	0.47
To recognize and understand the use of protective equipment for disability sports	2.24	1.25
To prevent muscular injuries in athletes with spasticity and/or athetoid tendencies	1.94	1.14
To understand and take precautions for an athlete with atlantoaxial subluxations	1.76	0.9
To understand and take precautions for an athlete with cerebral palsy	1.94	1.09
To understand and take precautions for an athlete with multiple sclerosis	1.94	1.2
To understand and take precautions for an athlete with muscular dystrophy	1.88	1.22
To understand and take precautions for an athlete with mental retardation	1.94	1.09
To understand and take precautions for an athlete with spinal cord injuries	2.29	1.45
To treat heat related illnesses in athletes who do not have functional thermoregulatory mechanisms	2.71	1.31
To recognize and treat hip flexion contractures in wheelchair athletes	2.18	1.29
To recognize signs and symptoms of urinary tract infections	2.24	1.65
To recognize signs and symptoms of postpolio syndrome	1.65	1.06
To properly treat pressure sores	2.29	1.49
To recognize and treat swelling of the stump in an athlete with an amputation	1.71	1.05
To treat wheelchair athletes with shoulder pain so that they can continue to carry out their activities of daily living	2.53	1.33
To prescribe a training program for athletes in wheelchairs to prevent and treat orthostatic hypotension	1.41	0.51
To communicate effectively to athletes who use sign language	1.47	0.8
To properly transfer wheelchair athletes from their chair to an examining table	2.18	1.19

Figure 1. Descriptive statistics for disability- specific skills

<u>My educational experience prepared me:</u>	<u>Mean</u>	<u>S.D.</u>
To understand indications and contraindications to exercise for an athlete with arthritis	2.29	1.16
To understand indications and contraindications to exercise for an athlete with seizures	2.53	1.46
To understand indications and contraindications to exercise for an athlete with diabetes	3.59	1.18
To understand indications and contraindications to exercise for an athlete with cardiovascular disease	2.71	1.16
To properly treat an athlete who is having a seizure	4.00	0.94
To recognize and properly treat an athlete that is in diabetic shock	4.00	0.79
To recognize and properly treat an athlete that is hypoglycemic	4.06	0.66
To recognize and properly treat carpal tunnel syndrome	3.88	0.93
To recognize and properly treat rotator cuff injuries	4.47	0.51
To recognize and properly treat epicondylitis	4.47	0.51
To use PNF stretching to prevent injuries	4.47	0.51

Figure 2. Descriptive statistics for non-disability- specific skills

would be necessary if working with athletes with disabilities. The scores for each subject were averaged, and those averages were all combined to find a group mean of how prepared they felt. A three-way Analysis of Variance (ANOVA) was used to determine the differences between the mean scores for perception of athletic training education based on the subject's gender, previous Paralympic experience, or type of athletic training programs they completed. Results from the first main effect in the ANOVA test revealed no significant difference ($p > .05$) between males and females in their mean scores. Likewise, there was not a significant difference ($p > .05$) in the subject's perception of his/her education based on their previous volunteer Paralympic experience. Paralympic experience was defined by whether or not the ATC had ever worked as a volunteer at the Paralympic level, even if only one time. Finally, no significant difference ($p > .05$) was found between those who completed internship programs and those who completed curriculum programs.

Perception of Education and Years of Certification

A Spearman Rho correlation test was conducted to determine if years of certification as an athletic trainer was related to the subject's perception of his/her education. Results showed a mild relationship ($r = .52$) between the number of years that an individual had been certified as an ATC and how prepared each felt working with athletes with disabilities. Table 1 indicates the results of the distribution of perception scores over the years of certification.

Table 1. Distribution for the Years of Certification as an ATC and the Mean Score for Perception of Preparedness

Years of Certification	Frequency	Mean Score
1-5 years	1	1.83
6-10 years	4	2.60
11-15 years	8	2.75
16-20 years	4	2.37
21-25 years	2	2.75

Discussion

Athletic training within disability sports is an area that has the potential to grow in the next several years. It is important to have competent and educated ATCs working with athletes with disabilities. The results of this study investigated the perception of ATCs education with regard to disabilities.

Disability-specific Skills

Results showed that athletic trainers felt more prepared to do skills that were not specifically related to disabilities than they were to do skills that would only be needed when working with athletes with disabilities. For example, subjects scored much higher on skills such as treating rotator cuff tendonitis and epicondylitis than they did on skills such as treating swelling in the residual limb of an amputee or dealing with thermoregulatory issues. This makes sense since all of the subjects work less than five

hours a week with athletes with disabilities. Interestingly, many subjects reported feeling more prepared to work with common issues such as diabetes; however, when asked in the open-ended questions about nutritional issues for which they have felt unprepared, several responded with some concern about working with athletes with diabetes. Even an issue such as diabetes, which is mentioned specifically in the NATA competencies, is still a concern with ATCs who have been out in the field for a year or more.

Type of Athletic Training Educational Program

The results suggested that there was no significant difference between the type of educational program the subjects graduated from and their level of preparedness. This suggests that neither the curriculum nor internship programs are better at preparing athletic trainers to work with athletes with disabilities. Even though the internship program allows more field experience than classroom work, it is very possible that none of this fieldwork involves working with athletes with disabilities. In fact, the responses to the open-ended question, "Are there other areas concerning athletes with disabilities that you feel could be better covered in undergraduate athletic training educational programs?" suggest that many ATCs felt as though disability sports was not covered at all, regardless of the type of program they went through. Many subjects recommended increased exposure to disability sports while in college, such as working Special Olympic events, or covering community disability sport events. In addition, course work in the area of disabilities could increase the understanding of how to deal with such issues.

Paralympic Experience

Whether or not an ATC had volunteered with the Paralympics in the past had no influence on his/her perception of how their education prepared them to work with disabilities. This suggests that the ATCs who are covering events for athletes with disabilities do not feel prepared, at least by their undergraduate education, to deal with the issues surrounding these disabilities. A comment made by one subject implied that the medical coverage at the Paralympics was done by a "multispecialty medical staff rather than only assigning ATCs," partly for this reason. Although the Paralympics is fortunate enough to have that option, local and community events most likely do not have the opportunity to have several people on their medical staff, thus making it important to educate athletic training students so that they may feel prepared in this area.

Years of Certification

A mild relationship was found between the number of years the subject was certified as an ATC and his/her perception of their athletic training education. It was predicted that the longer an individual had been certified, the less prepared they would have felt working with athletes with disabilities. The reason for this hypothesis was that since the competency areas were new, the ATCs who had been out of school the longest would not have been required to learn these competencies. The opposite was found in this study; that is, the more years an ATC had been certified, the more prepared they felt by their education to work with this population. This suggests that either the material was being taught when they were in school, or they have learned from the experience of their clinical work and are attributing it to their education. Since the athletic trainers who have

been out of school the least amount of time scored the lowest on feeling prepared, it suggests that educational programs may not have had time to respond to the new competencies and are still adjusting to these changes.

Treatment for Athletes with Disabilities

On average, subjects felt unprepared to treat injuries or illnesses among athletes with disabilities. In an open-ended question concerning treatment, most subjects reported that they felt there was a difference in the treatment for athletes with disabilities. Concerns included the sensory losses when using heat or cold, central nervous system problems such as spasticity and seizure disorders, and cervical problems in athletes with Down syndrome. Even communication with the athletes was a concern for one ATC. Although a few subjects reported that treatment is the same between athletes with and without disabilities, others reported that the treatments are the same, but under different parameters. For example, ice is still ice, but because of the added stresses to the body of an athlete with a disability, ice may be used differently with them. More considerations need to be taken for the ADLs that need to be done regardless of injury or disability. A wheelchair athlete with rotator cuff tendonitis will not be able to take as much rest as someone who does not need to use his/her arms for ambulation. While some treatments may be similar, it is important to recognize the differences in athletes with disabilities and treat accordingly.

Continuing Education for Those who Work with Disabilities

When asked about the opportunity to attend sports medicine workshops and seminars pertaining to athletes with disabilities as part of their continuing education, most subjects

reported that they have not had that opportunity because of unavailability of such workshops in their areas. Several of those who have attended workshops and seminars on this topic have also been involved with teaching them. These results suggest that there are not enough opportunities for continuing education in the area of disability sports. Little interest or few resources may be factors that contribute to the lack of this education.

Conclusion

In conclusion, athletic trainers who work with disability sports do not feel that their undergraduate athletic training education prepared them to work with disabilities. This study reveals that ATCs feel significantly more prepared to perform skills that are universal rather than those that are specific to athletes with disabilities. In addition, there are very few continuing education opportunities for ATCs to improve upon these skills.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to examine the perception that ATCs have of their athletic training education and how it prepared them to work with athletes with disabilities.

Nineteen ATCs, who were among those on a list compiled by the medical director at the USOC, completed the survey. Survey questions included demographics, perception of athletic training education, and open-ended questions.

Results indicated that ATCs who work with disability sports do not feel as though their athletic training education prepared them to work with persons with disabilities. Subjects reported feeling significantly more prepared for skills that are universal versus those that are strictly used with athletes with disabilities. In addition, perception of preparedness was not influenced by gender, length of time certified as an athletic trainer, or past Paralympic experience. Responses to the open-ended questions suggested that ATCs feel as though more education in the area of disabilities, as well as more continuing education opportunities are warranted.

Conclusions

Although there were no significant differences between the perceptions of athletic training education and the type of program the subjects graduated from, their gender, or their past Paralympic experience, there were significant differences in the skills that

ATCs may have to demonstrate. Subjects viewed themselves as being significantly less prepared for those skills that are specific to disability sports than for the skills that are universal to all types of athletes. In addition, subjects disagreed that their education prepared them to work with this population. As a result, the hypothesis that ATCs do not feel that their undergraduate athletic training education prepared them for working with athletes with disabilities was accepted.

In addition, results also showed that the length of time an ATC had been certified was mildly correlated with how prepared they felt to work with disabilities. Thus, the hypothesis that the longer someone has been working as an ATC with disability sports, the less he/she will have felt prepared by the undergraduate education, was rejected.

Recommendations

Several recommendations can be made from the results of this study.

1. A follow-up study should be conducted with all certified athletic trainers to determine their perception on their education and how prepared they would feel to work with disabilities. Since the number of subjects for this study was limited, and most work very little with athletes with disabilities, it would be reasonable to survey all ATCs, regardless of their experience with disabilities. In this follow-up, larger and randomly chosen sample groups should be used. A follow-up study could also be completed with new graduates of athletic training programs to determine if institutions are currently putting the new competency areas into practice.

2. The JRC-AT should reconsider their competency area on medical considerations and disabilities to make sure they are truly covering disabilities, and not just medical

conditions. In addition, they should also consider adding more competencies in the area of disabilities to better service the three million athletes in this population. It is important to teach athletic training students about disabilities for three reasons. First, there are an ever-increasing number of disability sports and teams forming which may someday require fulltime medical coverage. Secondly, laws such as the Americans with Disabilities Act are making it possible for individuals with disabilities to partake in regular athletics. It is unlawful to prevent someone from playing a sport due to his/her disability. Finally, even if athletic trainers are working in a non-disabled setting, there is always the possibility of athletes acquiring a disability, such as a spinal cord injury, and ATCs should be prepared to help them.

3. Institutions should consider incorporating clinical experiences with athletes with disabilities into their educational programs. These experiences can be gained through volunteering for local events, such as working with the Special Olympics, or through clinics and hospitals.

Due to the low number of surveys sent out and the response rate, the conclusions and recommendations from this survey are limited to the athletic trainers who have worked for the USOC. However, further research in this area may indicate similar perceptions of athletic training education amongst the larger population. It is highly recommended that additional studies be conducted.

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APPENDIX A
QUESTIONNAIRE

2000-2001

Perception of Educational Training

By

Athletic Trainers Working with Disability Sports

**Mindy Kearney, ATC
University of Wisconsin- La Crosse**

Adapted Physical Education Program

GENERAL DIRECTIONS

Please complete this survey by following the directions provided at the beginning of each section.

Continue to the next page



SECTION I- DEMOGRAPHICS

In the following section, please use an "X", when appropriate, to mark the answer which best describes your response to each question.

1. What is your age? _____
2. What is your gender? _____ Male _____ Female
3. Of which NATA district are you a member?
- _____ District 1
 - _____ District 2
 - _____ District 3
 - _____ District 4
 - _____ District 5
 - _____ District 6
 - _____ District 7
 - _____ District 8
 - _____ District 9
 - _____ District 10
4. From which type of athletic training program did you graduate?
- _____ Curriculum
 - _____ Internship
5. Do you have additional credentials aside from ATC?
- _____ PTA
 - _____ PT
 - _____ EMT
 - _____ MD
 - _____ OT
 - _____ PA
 - _____ Other (please specify) _____
6. Do you hold advanced degrees?
- _____ No advanced degrees
 - _____ Master's degree in (area) _____
 - _____ PhD in (area) _____
 - _____ Other _____

7. How many years have you been certified as an athletic trainer?

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- 26-30 years
- More than 30 years

8. How many years have you been working as an athletic trainer with disability sports?

- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21-25 years
- 26-30 years
- More than 30 years

9. How would you classify your work with disability sports?

- Full time
- Part time
- Volunteer

10. Which best describes your primary work setting?

- Clinic/Hospital
- College/University
- High School
- Clinic/High School
- Professional sport team
- Junior College
- Industrial
- Other (please specify) _____

11. On average, how many hours per week do you work with athletes with disabilities?

- Less than 5
 5-10
 11-15
 16-20
 21-25
 26-30
 31-35
 36-40
 More than 40

12. With which of the following disabilities do you commonly work? (Check all that apply.)

- Multiple sclerosis
 Cerebral palsy
 Spinal cord injuries
 Amputations
 Blind/visually impaired
 Deaf/ Hearing impaired
 Mental retardation
 Dwarfism
 Other (please specify)_____

13. Do you work with any of the following Disability Sport Organizations? (Check all that apply.)

- Disability Sports USA (DSUSA)
 Dwarf Athletic Association of America (DAAA)
 U.S. Association of Blind Athletes (USABA)
 U.S. Cerebral Palsy Athletic Association (USCPAA)
 Wheelchair Sports USA (WSUSA)
 Special Olympics (SO)
 American Athletic Association for the Deaf (AAAD)
 Other_____

14. Have you ever worked as a volunteer at the Paralympic level?

- Yes No

SECTION II- PERCEPTION OF UNDERGRADUATE EDUCATION
--

In the following section, please rate how you feel your education prepared you for the skill listed using the scale below:

- 1- strongly disagree
- 2- disagree
- 3- no difference
- 4- agree
- 5- strongly agree

My educational experience prepared me:

A. To prevent and recognize autonomic dysreflexia.

1 2 3 4 5

B. To recognize and understand the use of protective equipment for disability sports.

1 2 3 4 5

C. To prevent muscular injuries in athletes with spasticity and/or athetoid tendencies.

1 2 3 4 5

D. To understand and take precautions for an athlete with atlantoaxial subluxations.

1 2 3 4 5

E. To understand indications and contraindications of exercise for an athlete with cerebral palsy.

1 2 3 4 5

F. To understand indications and contraindications to exercise for an athlete with multiple sclerosis.

1 2 3 4 5

G. To understand indications and contraindications to exercise for an athlete with muscular dystrophy.

1 2 3 4 5

H. To understand indications and contraindications to exercise for an athlete with mental retardation.

1 2 3 4 5

I. To understand indications and contraindications to exercise for an athlete with arthritis.

1 2 3 4 5

J. To understand indications and contraindications to exercise for an athlete with seizures.

1 2 3 4 5

K. To understand indications and contraindications to exercise for an athlete with spinal cord injuries.

1 2 3 4 5

L. To understand indications and contraindications to exercise for an athlete with diabetes.

1 2 3 4 5

M. To understand indications and contraindications to exercise for an athlete with cardiovascular disease.

1 2 3 4 5

N. To treat heat related illnesses in athletes who do not have functional thermoregulatory mechanisms.

1 2 3 4 5

O. To recognize and treat hip flexion contractures in wheelchair athletes.

1 2 3 4 5

P. To recognize signs and symptoms of urinary tract infections.

1 2 3 4 5

Q. To recognize the signs and symptoms of postpolio syndrome.

1 2 3 4 5

R. To properly treat an athlete who is having a seizure.

1 2 3 4 5

S. To recognize and properly treat an athlete that is in diabetic shock.

1 2 3 4 5

T. To recognize and properly treat an athlete that is hypoglycemic.

1 2 3 4 5

U. To properly treat pressure sores.

1 2 3 4 5

V. To recognize and treat swelling of the stump in an athlete with an amputation.

1 2 3 4 5

W. To treat wheelchair athletes with shoulder pain so that they can continue to carry out their activities of daily living.

1 2 3 4 5

X. To prescribe a training program for athletes in wheelchairs to prevent and treat orthostatic hypotension.

1 2 3 4 5

Y. To recognize and properly treat carpal tunnel syndrome.

1 2 3 4 5

Z. To recognize and properly treat rotator cuff injuries.

1 2 3 4 5

AA. To recognize and properly treat epicondylitis.

1 2 3 4 5

BB. To use PNF stretching to prevent injuries.

1 2 3 4 5

CC. To communicate effectively to athletes who use sign language.

1 2 3 4 5

DD. To properly transfer wheelchair athletes from their chair to an examining table.

1 2 3 4 5

4. Have you had the opportunity to attend sports medicine workshops and seminars pertaining to athletes with disabilities as part of your continuing education? If no, why not?

5. Are there any other areas concerning athletes with disabilities that you feel could be better covered in undergraduate athletic training educational programs? Please explain.

APPENDIX B
COVER LETTER

16 Wittich Hall
UW-La Crosse
La Crosse, WI 54601

January 25, 2001

Dear Certified Athletic Trainer,

My name is Mindy Kearney, and I am a certified athletic trainer finishing my graduate work at the University of Wisconsin- La Crosse in the Adapted Physical Education program. I am currently conducting my thesis regarding how ATC's who work with athletes with disabilities perceive their athletic training education. Based on your involvement as an ATC with disability sports, I would like to ask for your feedback on how you think your education prepared you to work with athletes with disabilities. This study is a survey that will take approximately 10-15 minutes to complete.

This survey has been forwarded to you from another member of the disability sport organization for which you work. This individual has been asked to assign the numbers on the survey to each of you for response purposes. However, neither I nor my committee members know which number survey has been assigned to you. While there may be some questions in the demographics that may identify individuals, the surveys will be kept completely confidential. Any quantitative data will be analyzed and published as group data only. Some of the qualitative information may be used as direct quotes, but no identifying information will be provided. As such, there are no inherent risks in participating in the study.

Enclosed please find a five-page survey. Please complete and return the survey, within the next two weeks, in the self-addressed stamped envelope that is provided. You will also find a postcard enclosed. If you would like the results of this study mailed to you, please complete the mailing information and return the postcard separately from the survey.

Participation in this survey is completely voluntary. Should you feel that you cannot participate in the study at this time, please disregard this information. Your return of the survey signifies your consent to participate in the study.

I appreciate your time and cooperation in completing this survey, as your experience and perspective are invaluable in making this research successful. If you have any questions about the study, please feel free to contact me. Please let me know if there is any way that I can be of assistance to you in the future.

Sincerely,
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