2004

Competencies and attitudes of athletic trainers toward disability sport services

Mark T. Fowler
San Jose State University

Follow this and additional works at: https://scholarworks.sjsu.edu/etd_theses

Recommended Citation

Fowler, Mark T., "Competencies and attitudes of athletic trainers toward disability sport services" (2004). *Master's Theses*. 2655.
DOI: <https://doi.org/10.31979/etd.59zr-2gws>
https://scholarworks.sjsu.edu/etd_theses/2655

This Thesis is brought to you for free and open access by the Master's Theses and Graduate Research at SJSU ScholarWorks. It has been accepted for inclusion in Master's Theses by an authorized administrator of SJSU ScholarWorks. For more information, please contact scholarworks@sjsu.edu.

COMPETENCIES AND ATTITUDES OF ATHLETIC TRAINERS TOWARD
DISABILITY SPORT SERVICES

A Thesis

Presented to

The Faculty of the Department of Human Performance

San Jose State University

In Partial Fulfillment

of the requirement for the Degree

Master of Arts

By

Mark T. Fowler

December 2004

UMI Number: 1425457

Copyright 2004 by
Fowler, Mark T.

All rights reserved.

INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

UMI[®]

UMI Microform 1425457

Copyright 2005 by ProQuest Information and Learning Company.

All rights reserved. This microform edition is protected against
unauthorized copying under Title 17, United States Code.

ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346

© 2004
Mark T. Fowler
ALL RIGHTS RESERVED

APPROVED FOR THE DEPARTMENT OF HUMAN PERFORMANCE

Dr. Nancy Megginson (Chairperson)

Dr. Leamor Kahanov

Glen Borgeson, M.S., A.T.C., California State University, Hayward

APPROVED FOR THE UNIVERSITY

ABSTRACT

COMPETENCIES OF ATHLETIC TRAINERS TOWARD DISABILITY SPORT
SERVICES

By Mark T. Fowler

The purpose of this study was to investigate the perceived competencies and attitudes of certified athletic trainers toward disability sport services. A questionnaire was developed and administered to male and female certified athletic trainers from the California Athletic Trainer's Association (CATA). The one-page questionnaire was comprised of demographic information, 17 professional competency concepts, and five attitudinal statements assessing the certified athletic trainer's competencies and attitudes regarding disability sport.

Certified athletic trainers rated their competencies toward disability sport as poor to fair and rated their attitudes toward disability sport concepts as high. A low positive relationship was observed between perceived competencies and attitudes of certified athletic trainers. Therefore, certified athletic trainers who perceived low competence toward disability sport service delivery wanted to learn more about athletic training service for athletes with disability as well as disability sport concepts.

ACKNOWLEDGEMENTS

To Dr. Nancy Megginson for her enthusiasm, knowledge, and patience during this lengthy process. Without her encouragement and words of wisdom I may never have finished this research. I know it took longer than it should have but I can't thank you enough for your hard work.

To my wife, Karrah, for her continued love and support. Her encouragement through this process has allowed me to experience one of my life's goals. Thank you and I love you.

To my parents for providing me with all the opportunities a kid could ask for. I never would have been able to take on a project like this without your encouragement and love. Thank you.

To Dr. Leamor Kahanov for serving as a committee member and always prodding me to finish.

To Glen Borgeson for serving as a committee member and being a mentor. Thanks for teaching me everything you know.

TABLE OF CONTENTS

	<u>Page</u>
List of Tables	viii
Chapter 1. Introduction	1
Purpose of the Study	4
Research Questions	4
Limitations	4
Delimitations	5
Definition of Terms	5
Summary	7
Chapter 2. Review of Literature	9
Development of Professional Competence	9
The Evolution of Disability Sport	11
The History of Athletic Training	13
Incidence of Injury in Disability Sport	15
Summary	20
Chapter 3. Method	23
Subjects	23
Instrument Development	23
Pilot Study Procedures	25

Pilot Study Results	26
Main Study Procedures	27
Data Analysis	27
Summary	28
Chapter 4. Results	29
Primary Study	29
Descriptive Statistics	29
Factor Analysis	30
Observable Patterns	31
Attitudes	31
Relationship	32
Summary	33
Chapter 5. Discussion and Recommendation	35
References	42
Appendix A: Pilot Study Survey	47
Appendix B: Human Subjects Letter	50
Appendix C: Consent Form	52
Appendix D: Main Study Survey	54
Appendix E: Tables	57

List of Tables

Tables

Table 1: Primary Study Factor Matrix and Reliability Estimates	58
Table 2: Mean and Standard Deviation of ATCs' Competence Ratings by Factor	59
Table 3: Descriptive Statistics of Attitude Statements	60
Table 4: Comparison of Descriptive Statistics of Participants' Enrollment in an Adapted Physical Activity Class	61
Table 5: Comparison of Descriptive Statistics of Participants' Experience Working with Disability Sport	62

Chapter 1

Introduction

Today, more than 4,000 athletes from 120 countries participate in the Summer Paralympics, while more than 1,100 athletes from 36 countries compete in the Winter Paralympic Games (United States Paralympics, 2004). An estimated two to three million people participate in disability sport either recreationally or competitively (Ferrara, Buckley, Messner & Benedict, 1992).

As with athletes without disabilities, the probability of injuries to athletes with disability has also increased proportionately and requires much more attention (Birrer, 1984; Bloomquist, 1986; Ferrara & Buckley, 1996; Ferrara, Buckley, Messner et al, 1992). Abrasions, lacerations, blisters, sprains, and strains are very common in disability sport as they are in sport for athletes without disability (Ferrara & Buckley, 1996); however, athletes with disability can also incur various injuries as a result of their disability. For example, wheelchair-using athletes are predisposed to pressure sores (from sitting too long) and environmental conditions due to thermoregulatory dysfunctioning (Bloomquist, 1986; Botvin-Madorsky & Curtis, 1984; Mangus, 1987; Mangus, 1988).

Research has focused on incidence of injury, treatments, and types of injuries occurring in disability sport. Ferrara and Buckley (1996) found that athletes with disability were injured at the same rate as athletes without disability; however, research has suggested that athletes with disability do not readily seek medical evaluation and/or

treatment (Ferrara, Buckley & McCann, et al., 1992). Furthermore, Ferrara, Buckley, McCann, et al. (1992) found that only 18% sought out an athletic trainer for evaluation. Athletes with disabilities would benefit from seeking evaluation from a certified athletic trainer since they are injured at the same rate as athletes without disability. However, are athletic trainers competent to serve athletes with disabilities?

Educational domains of certified athletic trainers include preventing athletic injuries; recognizing athletic injuries; immediate care of athletic injuries; treatment, rehabilitation and reconditioning the athlete; organization and administration; and professional development (Arnheim & Prentice, 1993; National Athletic Trainer's Association 6/7/04); however, most certified athletic trainers do not have experience preventing, treating, evaluation, or rehabilitating injuries experienced by athletes with disabilities (Gayle & Muir, 1992). In the past, athletic training students were required to complete 1500 hours of athletic training clinical work under the direct supervision of a certified athletic trainer before taking the National Athletic Trainer's Association Board of Certification (NATABOC) examination (NATABOC, 11/20/99). Prior to January 2004, the NATA guidelines did not include working with athletes with disabilities or completing adapted physical activity coursework as prerequisites to certification. In addition, adapted physical activity courses were not required at many of the colleges and universities offering a degree in athletic training. Today, the NATA has evolved from internship to an accredited educational program. According to the Commission on

Accreditation of Allied Health Education Programs (CAAHEP), athletic training

students:

shall receive formal instruction in the following expanded subject matter areas in conjunction with the NATA Athletic Training Educational Competencies: Assessment of injury/illness, exercise physiology, first aid and emergency care, general medical conditions and disabilities, health care administration, human anatomy, human physiology, kinesiology/biomechanics, medical ethics and legal issues, nutrition, pathology of injury/illness, pharmacology, professional development and responsibilities, psychosocial intervention and referral, risk management and injury/illness prevention, strength training and reconditioning, statistics and research design, therapeutic exercise and rehabilitative techniques, therapeutic modalities, and weight management and body composition (CAAHEP, 5/21/04).

According to the NATA, the competency areas are: Risk management and injury prevention, pathology of injury and illness, assessment and evaluation, acute care of injury and illness, pharmacology, therapeutic modalities, therapeutic exercise, general medical injuries and disabilities, nutritional aspects of injury and illness, psychosocial intervention and referral, health care administration, and professional development and responsibilities (NATA, 5/21/2004). In addition, CAAHEP requires students to complete a minimum period of two academic years of clinical experience, including “ample opportunity for supervised student coverage of athletic training practices and competitive events both men’s and women’s sports and physical activities including, but not limited to, activities such as football, soccer, hockey, wrestling, basketball, gymnastics, volleyball, lacrosse, and rugby,” under the direct supervision of a certified athletic trainer (CAAHEP, 2001). The language used by the CAAHEP Athletic Training Education

Program remains vague when describing athletic training and its role toward disability sport service delivery.

Athletic trainers may not be competent to evaluate injuries incurred by athletes with disability due to a lack of knowledge, skills, and attitudes. In order for athletes with disability to receive quality healthcare, the athletic trainer must be competent in each of the domains of an athletic trainer as they relate to athletes with disability. Therefore, there is a need to assess the competency and attitude levels of athletic trainers toward select aspects of disability sport as it relates to athletic training services.

Purpose of the Study

The purpose of this study is to investigate the perceived competencies (knowledge and skills) and attitudes of certified athletic trainers (ATC) toward their service delivery and select concepts of disability sport.

Research Questions

1. How will certified athletic trainers perceive their competencies related to disability sport?
2. How will certified athletic trainers perceive their attitudes related to disability sport?
3. Is there a relationship between perceived competencies and attitudes of certified athletic trainers towards disability sport service delivery?

Limitations

1. The sample may not be an adequate representation of the competencies of certified athletic trainers across the country.

2. Subjects may not have responded to the survey items truthfully or may have omitted items.
3. Subjects used were from only one geographical area.
4. The study was limited to a timely return within the guidelines stated.

Delimitations

1. The study was delimited to certified athletic trainers (ATC)
2. The study was delimited to ATCs in the California Athletic Trainer's Association (CATA)
3. The study was delimited to ATCs listed on the National Athletic Trainer's Association address list.

Definition of Terms

1. *Adapted physical activity*: Adapted physical activity is a comprehensive term that incorporates the aspects of adapted physical education, adapted physical recreation and adapted sport programming under one concept (Poretta, Nesbitt, & Lebanowich, 1993). Adapted physical activity: (a) is an interdisciplinary body of knowledge directed toward psychomotor problems throughout the total life span and (b) advocacy of exercise and sport for all persons and (c) should be utilized by hospitals, schools, and communities (Poretta, Nesbitt, & Lebanowich, 1993).

2. *Attitude*: A manner, disposition, feeling, position, etc. with regard to a person or thing; tendency or orientation especially of the mind (Costello, 1992).

3. *Certified Athletic Trainer (ATC)*: An allied health professional who has a bachelor's degree from an accredited college/university, has fulfilled the requirements for certification as established by the National Athletic Trainer's Association Board of Certification (NATABOC) and has passed the certification examination administered by the NATABOC (NATABOC, 11/20/1999). Certified athletic trainers (ATCs) are unique health care providers who specialize in the prevention, assessment, treatment and rehabilitation of injuries and illnesses that occur to athletes and the physically active.

4. *Competencies*: A competency can be viewed as a behavior or quality of a person, having a set of skills or knowledges that an individual selects and implements (Oliver, 1990). To perceive competency means to recognize, discern, or understand one's abilities, skill, or knowledge (Costello, 1992).

5. *Disability Sport*: A continuum of developmental and competitive, mainstreamed and/or disability-specific sport opportunities for individuals with disabilities (DePauw & Gavron, 1995). It refers to a person's participation in formalized disability sports competition at the regional, national, and international levels (Poretta, Nesbitt, & Lebanowich, 1993).

6. *NATA Educational Competencies*: (a) risk management and injury prevention, (b) pathology of injury and illness, (c) assessment and evaluation, (d) acute care of injury and illness, (e) pharmacology, (f) therapeutic modalities, (g) therapeutic exercise, (h) general medical conditions and disabilities, (i) nutritional aspects of injury and illness, (j)

psychosocial intervention and referral, (k) health care administration, (l) professional development and responsibilities (NATA, 5/21/04).

Summary

Certified athletic trainers are highly skilled allied health care professionals with competencies in various areas such as, but not limited to, prevention, assessment, treatment, and rehabilitation of injuries and illnesses that occur to athletes and the physically active. ATCs are required to graduate from an accredited educational program, complete a minimum of two years clinical experience, and pass a three-part certification examination (NATA, 5/21/04). However, CAAHEP Athletic Training Education Programs do not require students to take courses dealing with athletic training service delivery toward athletes with disability. In addition, CAAHEP Athletic Training Education Programs do not require clinical experience directly with athletes with disability. Without formal education or experience certified athletic trainers are not competent to evaluate a majority of disability sport injuries. It should be noted that the research collected from this study does not differentiate CAAHEP Athletic Training Education Programs from past internship based programs.

Research has shown an increasing amount of persons with disabilities participating in disability sport. More than 4,000 athletes countries participate in the Summer Paralympics, while more than 1,100 athletes compete in the Winter Paralympic Games (United States Paralympics, 2004). In addition, research has found that athletes with disability are injured at similar rates to athletes without disability (Ferrara &

Buckley, 1996). However, athletes with disabilities rarely seek evaluation from an athletic trainer. This is due in large part to the fact that athletic trainers are not always involved with disability sport (Ferrara, Buckley, McCann, et al., 1992). The purpose of this study was to measure the perceived competencies and attitudes of ATCs toward select concepts of disability sport. Three research questions were addressed: How will certified athletic trainers perceive their competencies related to disability sport? How will certified athletic trainers perceive their attitudes related to disability sport? Is there a relationship between perceived competencies and attitudes of certified athletic trainers towards disability sport service delivery?

Chapter 2

Review of Literature

The purpose of this study was to investigate the perceived competencies and attitudes of certified athletic trainers toward their service delivery and select concepts of disability sport. For the following review, the literature has been divided into four categories: (a) development of professional competence; (b) literature pertaining to the evolution of disability sport; (c) literature pertaining to the history of athletic training and (d) incidences of injury in disability sport and the role of the athletic trainer.

Development of Professional Competence

Competence is an old concept that cannot be easily defined. Chickering and Claxton (1981) found that individual differences are inevitable when thinking of competence. Those individuals who display competence possess and use proficiently critically required skills, abilities, knowledge, judgments, attitudes, and values. Finally, competence can be viewed as a behavior or quality of a person, having a set of skills or knowledge that an individual selects and implements (Oliver, 1990).

Chickering and Claxton (1981) set forth four basic principles, underlying the expression and development of competence. These four basic principles state: competence is internal and external, situational and personal; competence is limited by a person's perceptions, neurological system, and character; achieving competence requires diverse learning styles; and competence itself is a motivational force. To be fully competent, an individual's abilities must interact with particular situations and contexts. For example, a medical doctor is fully competent when diagnosing disease; however,

these abilities are not transferable to other situations, such as repairing a car or coaching a football team (Chickering & Claxton, 1981).

As stated previously, competence is personal, relying on the individual's perceptions and character. It is well known that no one person is the same, nor has the same perceptions or conceptions as another. This is due in part to vastly different, individualistic physiological internal rhythmic pattern controlling responses (Chickering & Claxton, 1981). That is, everyone is physiologically different and so responses will be inherently different as well. For this reason, individuals depend on perceiving through sight and sound to develop competence, forming outlooks and expectations. This is achieved, but should not be limited, by formal education. Formal education allows an individual the understanding of basic knowledge and expectations; however, to be fully competent, an individual must be confident in his or her abilities. This confidence cannot be gained in any formal education, but rather depends on the individual's life experiences (Chickering & Claxton, 1981). For example, students who show the greatest competency levels may not have received the best grades. They have participated in internships or assistantships, developing an overall competence and ability to adjust to situations in their field.

Developing and maintaining a skill or competence requires different learning styles. Individuals are continually determining which learning abilities they will use in a given situation. According to the experiential learning model, the individual who learns

must have four kinds of abilities: Concrete experiences, reflective observation, abstract conceptualization, and active experience (Kolb, 1980). These four abilities occur in a cycle, where individuals observe concrete experience and reflect upon them to form abstract generalizations (reflective observation). The individual then creates theories about the new experience (abstract conceptualization) and uses these theories to make decisions (active experience). In addition, an individual's competence and learning ability grow in steps. An individual must first acquire basic learning abilities. This leads to a specialization of skills and an emphasis on a certain learning style. Finally, these styles of learning are integrated into life experiences (Kolb, 1980).

The Evolution of Disability Sport

Adapted physical activity can be dated back to ancient China where exercise was used to rehabilitate disorders (DePauw & Sherrill, 1994). It was not until after World War II, when veterans began participating in disability sports, that adapted physical activity began to grow and gain recognition (DePauw & Sherrill, 1994). During this time, disability sport changed roles from a medical need for rehabilitation to a competitive sport participation (Botvin-Madorsky & Curtis, 1984; DePauw & Sherrill, 1994). The early development of competitive disability sport consisted of sanitized, artificial play experience with the purpose to ensure victory during a seemingly tainted experience. During this period, athletes with disabilities were not allowed real-life situations or to experience defeat (Botvin-Madorsky & Curtis, 1984).

Steadward and Walsh (1986) reported the first competitive sporting event for those with disabilities took place with 16 ex-members of the British Forces (14 men, 2 women). By 1952, the Stoke Mandeville Games became the first annual international event when a group of ex-servicemen from Holland traveled to England. In 1960, the first Olympic Games for the Physically Disabled took place in Rome, allowing 400 wheelchair athletes a competitive arena. As of 1984, more than 3000 athletes with disability competed in the Olympic Games at New York. Athletes, participating in sport at these games, expanded from predominantly wheelchair competition to include athletes with blindness, deafness, amputation, and cerebral palsy. In 1996, 3500 athletes competed in the Paralympics in Atlanta (United States Association of Blind Athletes, 1999). Today, more than 4,000 athletes from 120 countries participate in the Summer Paralympics, while more than 1,100 athletes from 36 countries compete in the Winter Paralympic Games (United States Paralympics, 2004). This rise in the number of athletes with disability and the competitive nature of the athletic endeavor promotes a potential increase in sport-specific injuries.

Individuals with disabilities have the opportunity to participate in a growing range of athletic competition at various levels. They have the option to compete at local, national, and international levels in a number of different sports. These sports include: Swimming, tennis, table tennis, basketball, baseball, softball, soccer, quad rugby, volleyball, track and field events, weight lifting, snow skiing, water skiing and many others. Additionally, disability sport has undergone minimal modification from sport for

individuals without disability. For example, wheelchair basketball has few rule changes compared to basketball played without wheelchairs. The three point and free throw lines have not been moved and the baskets are the same height as basketball for athletes without disability (Botvin-Madorsky & Curtis, 1986).

Adapted Physical Activity, including disability sport, has changed drastically since its inception. Physical activity programs today offer choices and provide more individualized activities as well as provide challenges to those with disability [high risk sports such as mountain climbing and sky diving] (DePauw & Sherrill, 1994).

As stated previous, disability sport has grown tremendously since its start, allowing millions of athletes with disability a chance to participate in competitive sport (Ferrara, Buckley, Messner & Benedict, 1992). Disability sport remains similar to sport for athletes without disability: rules and equipment have undergone minimal modifications in comparison to sport for athletes without disability (Botvin-Madorsky & Curtis, 1986).

The History of Athletic Training

Athletic Training can be traced back to ancient Greece and Rome where the duty of the primitive athletic trainer was primarily to perform massage. After the fall of Rome, however, athletics became non-existent, giving way to warfare, physical contests and the Dark Ages.

Athletic Training was revived in the 19th century due to the breakthrough of gymnastics and football. These athletic trainers had minimal education, practiced

through trial and error and, in most cases, were adapted from boxing and horse “trainers”. In 1881, James Robinson was one of the first athletic trainers hired at Harvard University. By the early 1900’s, other universities began to hire athletic trainers.

During the next 40 years, athletic training experienced a major expansion including the development of the present day National Athletic Trainer’s Association (NATA) in 1950 and a certification exam in 1971 (J.L. McLean, personal communication, March 19,1999). Lindsay McLean was instrumental in the implementation of a certification exam that combined a written, practical and written simulation section (McLean, 1968). In 1971, 28 trainers completed the exam. In addition, 33 states today recognize ATC credentialing as the standard for licensing.

The NATA has been considered the governing body of athletic training. The mission statement of the NATA is: To enhance the quality of health care for athletes and those engaged in physical activity, and to advance the profession of athletic training through education and research in the prevention, management and rehabilitation of injuries (NATA, 10/9/99). In addition, the NATA sets forth numerous competencies required in the field. These competencies include: Risk management and injury prevention; pathology of injuries and illnesses; assessment and evaluation; acute care of injury and illness; pharmacology; therapeutic modalities and exercise; general medical conditions and disabilities; nutritional aspects of injury and illness; psychosocial intervention and referral; health care administration; and professional development and responsibilities (NATA, 10/9/99).

The athletic trainer is no longer viewed as a person who gives massage or who carries a bucket and sponge (Legwold, 1984). Today's certified athletic trainer is a health care professional that has completed an undergraduate degree and has passed the NATA Board of Certification exam. The certified athletic trainer is employed in high school, college, and university, professional, and clinical settings.

Incidence of Injury in Disability Sport

Very little information exists on the rate and type of athletic injuries in disability sport. However, the growing number of athletes competing in sports and the effort exerted during activity increase the possibility of injury. Some special considerations must be taken into account when dealing with the athlete with disability (Botvin-Madorsky & Curts, 1984; Bloomquist, 1986).

The athlete with disability experiences injury at the same rate as athletes without disability (Birrner, 1984; Bloomquist, 1986; Ferrara & Buckley, 1996; Ferrara, Buckley, Messner & Benedict, 1992). Ferrara and Buckley (1996) found that athletes with disability were injured at a rate of 9.45 per 1000 experiences, compared to college football (12-15/1000) and basketball (7/1000).

The wheelchair itself presents the athlete with disability numerous obstacles promoting injury (Bloomquist, 1986; Botvin-Madorsky & Curtis, 1984; Birrer, 1984; Curtis & Dillon, 1986; Hoebrigs, Eggen, & Debets, 1990; Mangus, 1988). Curtis and Dillon (1986) found that the majority of injuries among wheelchair athletes were associated with sports such as track, basketball, and road racing. These three sports

accounted for 72% of total injuries reported. There is a very low risk for injury in sports such as pool, bowling, archery, slalom, and table tennis. Blisters and lacerations are common and occur to the hands as a result of contact with the rim or tire during the push of the wheelchair. Abrasions occur when skin comes in contact with brakes, sharp edges or larger tires. Soft tissue injuries such as muscle pulls, tendonitis, bursitis, strains and sprains commonly occur at the elbow, shoulder, wrist and hands. Burnham, Higgins, and Steadward (1994) found that 34 of the 189 injuries reported (18%) were significant injuries resulting in time loss from competition or practice. Of these 34 injuries, 85% affected the shoulder, elbow, and wrist areas. The most predominant injury incurred by the wheelchair athlete is the decubitus ulcer that occurs because of shear forces and pressure primarily over the sacrum area (Bloomquist, 1986; Botvin-Madorsky & Curtis, 1984; Hoebrigs et al., 1990; Mangus, 1987). Carpal tunnel syndrome occurs as a result of improper technique or mechanics and the heel of the hand proving pressure against the tire rims (Bloomquist, 1986; Mangus, 1987). Wheelchair athletes present a range of pre-existing conditions and predisposition for illness and injury such as; bladder infection, autonomic dysreflexia, pressure sores, and intolerance to environmental conditions (Bloomquist, 1986; Hoebrigs et al., 1990, Mangus, 1987). Kegel and Malchow (1994) found that soccer athletes with amputations were most likely to sustain injuries to their knee, ankle, face, and shoulder that were similar to soccer athletes without disability. In addition, 48% (36 of 75) of the soccer players with disabilities reported experiencing at least one injury.

Ferrara, Buckley, Messner, et al. (1992) found that the thigh and knee were most frequently injured in snow skiing which was supported by McCormick (1985). Skiers thumb was also reported as common, caused by a hyperextension when the outrigger poles become buried in the snow during a fall (Ferrara, Buckley, Messner, et al., 1992, McCormick, 1985).

In a study examining incidence of injury in quad rugby athletes, Deivert and Megginson (1995) found that 13 of 94 (14%) athletes reported at least one injury that required medical attention. Of these injuries, seven (54%) were to the upper extremities; four involved the fifth finger. The second most common injuries (34%) were lacerations occurring to the head or face, while lower extremity, neck and thorax injuries occurred less frequently.

Injuries commonly occur during a fall, such as from a wheelchair. Fractures, although uncommon in the injury experience of athletes with disability, occur primarily to the clavicle and arm as a result of a fall during competition (Bloomquist, 1986; Hoebrigs et al., 1990). Second to falls, environmental conditions provide a mechanism to injury for the athlete with disability. Quadriplegic athletes may lack normal autonomic control of body temperature and sweating below the level of the injury that predispose these athletes to various heat-related illnesses. Hypothermia can be difficult to treat in the wheelchair athlete. Lack of muscle mass prevents the athlete from shivering to generate heat so removal of wet clothing and replacing with dry clothing becomes key. Showers are also effective for warming the athlete but care should be taken so that the

skin below the injury is not burned (Bloomquist, 1986; Botvin-Madorsky & Curtis, 1984).

Athletes with Down's Syndrome could have atlantoaxial instability, presenting another risk in athletic participation. Forced neck flexion could result in serious injury, causing the vertebrae to shift that could damage the spinal cord. Athletes with Down's Syndrome are required to receive appropriate physical examinations, including x-ray, before being allowed to participate in some sports. Those athletes who have instability are advised not to participate in sports such as gymnastics, high jump, soccer, and pentathlon as well as any other sport/exercise that may place pressure on the head and neck muscles (Bloomquist, 1986).

Additionally, athletes with disability can be injured as a result of improper technique due to poor training. This can be due to the lack of coaching available or the coach's ignorance toward sport-specific training. Research has found that about one out of three receive no coaching, depending on magazines and advice from other athletes as their source for training information (Liow & Hopkins, 1996; Hedrick, Morse, & Figoni, 1988). On occasion, athletes do not train specific to their sport. Short distance swimmers, requiring short sprints, have been found to train for long distance events while long distance athletes train by sprinting (Hedrick et al., 1988). This lack of adaptation from training to competition can predispose the athlete to muscle strains, fatigue and environmental health problems as a result of lack of transferability (Arnheim & Prentice, 1993).

Athletic trainers, for the most part, are not involved with disability sport. Ferrara, Buckley, McCann, et al. (1992) found that athletic trainers were not involved in immediate evaluation of acute injuries. Athletes with disability receive most of their medical attention from physicians and volunteers from such organizations as Red Cross or fire departments (Mangus, 1988). However, Ferrara and Buckley (1996) found that 15% of athletes with moderate and major injuries did not immediately seek medical attention. Ferrara, Buckley, McCann, et al. (1992) found that 45% of athletes with injuries sought primary medical care from a physician while 18% saw an athletic trainer. A competent athletic trainer on staff can provide immediate care and proper referral to the athlete with disability and thus help athletes stay in competition. Additionally, the athlete with disability, who seeks medical attention from physicians, may not be guaranteed the highest quality of rehabilitation. Physicians are often concerned with rehabilitating for functional returns and do not focus on the demands of sport activity (Mangus, 1988). Athletes that do not seek immediate medical attention often create greater damage to the area and increase healing time. This can be very debilitating, especially for wheelchair athletes with shoulder injuries who depend on their shoulders for everyday locomotion (Ferrara & Buckley, 1996).

The athletic trainer is a highly skilled health care professional. Athletic trainers are skilled in preventing athletic injuries; evaluating athletic injuries; applying first aid and emergency care; and rehabilitating and reconditioning athletic injuries (Arnheim & Prentice, 1993). In comparison to physicians and other health care professionals, athletic

trainers can be more accessible. In addition, athletic trainers understand the competitive nature of athletes and their concern for a quick, quality return to activity.

Prevention of athletic injuries is one of the most important aspects of disability sport. The athletic trainer must realize that the athlete with disability is predisposed to many injurious conditions. This is especially true for wheelchair athletes who are frequently injured because of the dangers provided by their apparatus. It is important to realize that, although rates of injuries are similar between athletes with and without disability, types of injuries are very different and specific to the disability sport (Mangus, 1987; Ferrara, Buckley, McCann, et al., 1992).

Summary

Physical activity for individuals with disability and athletic training first came into contact during World War II when disabled war veterans started competing in sport. Athletic trainers were instrumental in the rehabilitation of these injured soldiers (DePauw & Sherrill, 1994). Competitive disability sport has seen a rapid growth since its original inception. In 1960, the first Olympic Games took place in Rome and saw 400 athletes compete. In 1996, the Paralympic Games experienced an increase of nearly 10 times when 3500 athletes competed in Atlanta (Steadward & Walsh, 1986; United States Association of Blind Athletes, 5/9/99).

An increase in participation of athletes with disability coupled with the competitive nature and effort exerted by these athletes increases the chances of injury. The frequency and rates of injuries of athletes with disability is similar to those of

athletes without disability (Birrer, 1984; Bloomquist, 1986; Ferrara & Buckley, 1996; Ferrara, Buckley, McCann, et al., 1992). However, athletes with disability are often predisposed to certain injuries due to their disability or the use of wheelchairs (Bloomquist, 1986; Mangus, 1987). Athletes with injuries are rarely seen by athletic trainers (Ferrara, Buckley, McCann, et al., 1992). Physicians constitute the primary health care professional sought out but often do not realize the athlete requires rehabilitation specific to their sport (Ferrara & Buckley, 1996; Mangus, 1988).

In addition, it is necessary to educate coaches about various injuries and training methods (Ferrara & Buckley, 1996; Liow & Hopkins, 1996). Improper training results in injury more times than not and can be caused by a lack of coaching available or a coaches lack of knowledge. Coaches can play a huge factor in the treatment of athletic injuries. They are the first contact with the athlete and are the first to consult the athlete who is injured. They can make proper decisions and referrals for the injured athlete, increasing the chances for a faster return while preventing further structural damage. Research has shown that blisters and abrasions are common in disability sport (Mangus, 1988; Botvin-Madorsky & Curtis, 1984; Bloomquist, 1986). Coaches can treat these injuries on site and prevent injuries from requiring medical attention. Ferrara and Buckley (1996) reported that only 15% of athletes with more severe injuries received medical evaluation even when the athlete had a full time coach. The rise of athletes with disability participating in sport constitutes a need for coaches and a need for more research on the competencies of disability sport coaches.

Athletic trainers, as stated previously, are an integral part of the competitive arena. The NATA mission statement, as previously discussed, proposes its purpose is to enhance the quality of health care for athletes and those engaged in physical activity. This included athletes with disability in its broad statement. However, the NATA does not specify disability sport as part of a basic competency expected of an athletic trainer. Athletic trainers are not required to take any courses dealing with disability sport. For this reason, athletic trainers may find preventing, evaluating, and caring for disability sport injuries difficult.

The lack of research available regarding athletes with disability and injuries incurred constitutes a need for more research. Furthermore, research should focus on educating health care providers about disability sport, organizations and common types of injury. This lack of research and education is detrimental to the athlete with disability who depends on health care professionals for guidance and proper injury recognition.

Chapter 3

Method

The purpose of this study was to investigate the perceived competencies and attitudes of certified athletic trainers toward their service delivery and select concepts of disability sport. This chapter will describe the procedures that were used in conducting this study.

Subjects

One thousand four hundred twenty-two subjects were surveyed. Participants names were obtained from the California Athletic Trainer's Association (CATA) address list. The CATA membership directory is available to the public upon request. The study consisted of male and female certified athletic trainers (ATC) with a varying level of experience and education. A 30% return rate of all subjects from the CATA list was determined to be a satisfactory return.

Instrument Development

The survey was intended to ascertain certified athletic trainers' competencies and attitudes toward disability sport participation. The survey used for this study is a modification of an existing survey entitled Disability Sport and its role in Adapted Physical Education (Megginson & Lavay, 1998; Megginson and Lavay, 2001).

A one-page survey (Appendix A) was designed based on modifications to assess the ATC's competence and attitude toward disability sport. The survey contains three sections: (1) Demographic information, including age, sex, education and employment;

(2) rating of competencies and knowledge levels regarding disability sport concepts and (3) rating attitude towards disability sport statements. Specific concepts were designed and included in section two in regards to disability sport. Six disability sport/athletic training statements were developed to assess the ATC's attitudes toward disability sport. A five-point Likert-type scale was designed for section two (1=poor, 5=excellent) and three (1=strongly disagree, 5=strongly agree). The modifications made to this study included eliminating concepts directed toward adapted physical educators and inserting concepts regarding athletic training. For example, Megginson and Lavay's (1998) survey investigated competencies and attitudes of adapted physical activity educators toward incorporating disability sport opportunities for individuals with disabilities. Specific concepts such as "Disability sport skill assessment" and "Event management of disability sporting events" were modified, for the purpose of this study, to "Disability sport injury assessment" and "Organization of the medical team for disability sport events," respectively. "Developing appropriate training programs" was modified to "Developing appropriate training/rehabilitation programs for athletes with disability." Concepts such as "Legislation affecting sport opportunities for individuals with disabilities," "Various disability sport athlete classifications," and "Disability sport organizations and national governing bodies" were left unchanged. In addition, disability sport statements included in section three were altered to incorporate disability sport statements as they would apply to athletic training. For example, "All students with disabilities, regardless of type or severity of condition, should be exposed to disability sports in their physical education

programming” was modified to “Certified athletic training services should be provided for athletes with disability who engage in competitive sport.”

Initially, the survey was analyzed qualitatively. Four experts reviewed the items found within the survey to determine face validity. The “experts” held doctoral degrees (or were doctoral candidates) in the field of athletic training, adapted physical activity, physical therapy, and statistics, respectively. Each expert was asked to place each variable into one of three factors; (1) Foundation knowledge, (2) primary disability sport concepts, and (3) secondary disability sport concepts. Based on the review of the survey in terms of content, structure and level of understanding, revisions were made to the survey prior to dispersing to subjects.

Following the qualitative check, a pilot study took place to quantitatively assess the survey’s structure. The data from the pilot study was analyzed using a factor analysis to examine content validity.

Pilot Study Procedures

Approval from the Human Subjects Committee at San Jose State University was obtained prior to beginning the study (Appendix B). Ten ATCs were asked to complete the survey. These ATCs were selected base upon proximity in the Bay Area and were removed from the respondent pool.

The ATC participants were given a survey packet including a cover letter and one page survey. The cover letter explained the purpose of the study, outlined detailed

instructions about completion, and informed the ATCs of their rights and confidentiality.

Subjects were also asked to report on the structure and content of the survey.

Pilot Study Results

Overall, a mean age of pilot study subjects ($N=10$) was 26 years ($SD=2.9059$), ranging from 23 to 33 years old. There were six male and four female subjects. All 10 subjects reported a bachelor's degree as the highest degree obtained. The majority of subjects reported working in university settings ($n=5$) and reported having 2 to 6 years of athletic training ($n=6$) experience. A factor analysis (Varimax rotation) was performed on the 35 items but yielded no factor structure. Once the pilot study was completed and returned to the researcher, an exploratory Varimax factor analysis was performed on the perceived competency section to identify the basic constructs that underlie its items. However, factor analysis could not be obtained due to the lack of variability in the responses. The lack of variability was due in large part to the low number of subjects ($N=10$) used for the pilot study. The sample size needed to elicit a strong factor structure was determined by the number of items in the survey ($N=36$) multiplied by 10. For example, all subjects ($N=10$) rated their competency levels toward Deaf Sports Federation/USA, Dwarf Athletic Association of America, United States Association for Blind Athletes, United States Cerebral Palsy Association, United States Quad Rugby Association (USQRA) and the National Beep Baseball Association as poor (1/5), with no variance. This lack of variance, due in part to low numbers of pilot study subjects, did not allow a factor analysis. The pilot study was then given to experts in the fields of

adapted physical activity, athletic training, and statistics, respectively. Each expert was asked to place each variable into one of three factors; (1) Foundation knowledge, (2) primary disability sport concepts, and (3) secondary disability sport concepts. Based on the review of the survey in terms of content, structure and level of understanding, revisions were made to the main study survey (Appendix B) prior to dispersing to subjects.

Main Study Procedures

Approval from the Human Subjects Committee at San Jose State University was obtained prior to beginning the study. A survey packet including cover letter (Appendix C), survey (Appendix B), and stamped addressed envelope was sent to each ATC in the CATA. Subjects were instructed to fill out both sides of the survey to the best of their knowledge. Any questions (for clarification) were directed to the researcher.

One mailing was conducted. Subjects had three weeks from the time of the mailing to respond. A 30% return rate was determined by the researcher to be a satisfactory return.

Data Analysis

Perceived competency and attitudes of ATCs was analyzed by descriptive statistics, including means, standard deviations, and frequency distribution. A confirmatory Varimax rotated factor analysis was conducted. Internal consistency of each factor was determined by the coefficient alpha technique. A Spearman Rank-Difference correlation was utilized to determine the relationship between perceived

competency and attitude ratings of subjects toward athletic training service delivery in disability sport.

Summary

The questionnaire is a modification of the instrument used in the Megginson and Lavay (1998, 2001) study on the perceived competencies of adapted physical educators towards disability sport. Subjects were limited to certified athletic trainers in the CATA and were required to fill out a three-part questionnaire. Face validity was determined by allowing four experts to view the study and determine the appropriateness of the concepts included in the instrument. A pilot study was conducted on 10 ATCs located in the Bay Area to ascertain the content validity of the instrument. Based on recommendations provided by the experts and pilot study subjects, revisions were made to the questionnaire. An exploratory factor analysis was used to establish the structure of disability sport constructs. However, factor analysis could not be obtained due to the lack of variability in the responses. This was due in large part to the low number of subjects (N=10) used for the pilot study.

In the main study, data was analyzed using descriptive statistics (means, standard deviations, and frequency distribution), a confirmatory Varimax factor analysis, the coefficient alpha technique and the Spearman Rank-Difference correlation.

Chapter 4

Results

The purpose of this study was to investigate the perceived competencies and attitudes of certified athletic trainers (ATC) toward their service delivery and select concepts of disability sport. This chapter includes a description of the results of the primary study.

Primary Study

Five hundred ninety-two of the 1422 (41.6%) certified athletic trainers (ATC) responded. The sample was drawn from the entire CATA membership list.

Descriptive Statistics

The age range of the ATCs was 22 to 75 years of age with a mean age of 34 (N=589). A majority of the subjects were female (n= 321; 55%). Two hundred sixty five subjects were male (45%) and six did not report their gender. The most common certificate obtained besides athletic training certification was Physical Therapist (23%). Two hundred seventy-seven of the 592 subjects (49%) held at least one additional certificate. Three hundred seven (52%) subjects held a master's degree while 261 held a bachelor's degree (N=588; 44%). The majority of ATCs (n=221; 37%) had worked as an athletic trainer for one to five years, followed by ten plus years (n=168; 28%), six to ten years (n=114; 19%), and less than one year (n=79; 13%), respectively. The most frequent response to place of employment was the clinic (n=165, 27.9%), followed by other (n=115, 19.4%), university (n=114, 19.3%), secondary (n=100, 16.9%), community/junior college (n=74, 12.5%), and professional (n=18, 3%), respectively.

Three hundred thirty-seven ATCs have taken at least one adapted physical activity class (58%), while 250 (42%) had not taken any classes. One hundred twenty-eight ATCs reported taking one class, followed by two (n=82) and three (n=29) classes respectively. One hundred three (17%) ATCs reported some previous involvement with disability sport.

Factor Analysis

A rotated Varimax Factor solution was conducted to reduce 33 of the competence statements into manageable components. Fifty-seven percent of the variance in ratings was addressed into three, definable components, labeled foundation knowledge, primary disability sports, and secondary disability sport concepts.

Twelve items fell into foundation knowledge, three into primary disability sport, and six into secondary disability sport concept factors (Appendix E, Table 1).

The ratings that did not cluster into three primary components included (with M/SD; N): Stabilizing techniques (N=592, M=1.81, SD=1.02); legislation (N=590, M=1.47, SD=0.85); disability sport classifications (N=591, M=1.53, SD=0.85); beep baseball (N=588, M=1.50, SD=0.88); goal ball (N=585, M=1.31, SD=0.79); power soccer (N=581, M=1.35, SD=0.78); sitting volleyball (N=583, M=1.53, SD=0.92); and USCPAA (N=585, M=1.47, SD=0.91).

Observable Patterns

Certified athletic trainers rated their competencies toward select athletic training concepts as poor to fair (1-2 on Likert scale). ATCs felt most comfortable developing rehabilitation programs ($N=592$, $M=2.39$, $SD=1.12$) and assessing injuries incurred by athletes participating in disability sport ($N=588$, $M=2.36$, $SD=1.16$). ATCs were least familiar with legislation ($N=584$, $M=1.47$, $SD=0.85$), disability sport classifications ($N=585$, $M=1.53$, $SD=0.85$) and exercise modifications for athletes with atlanto-axial disorder ($N=590$, $M=1.57$, $SD=0.94$).

ATCs, for the most part, rated their competency toward disability sports as low. Wheelchair basketball ($N=586$, $M=2.38$, $SD=1.25$) was the most widely recognized sport while goal ball ($N=585$, $M=1.3077$, $SD=0.7923$) and power soccer ($N=581$, $M=1.3477$, $SD=0.7832$) were rated low.

Competence levels of athletic trainers toward disability sport organizations (DSO) and national governing bodies were poor. Special Olympics ($N=590$, $M=2.6678$, $SD=1.28$) was the most recognized DSO. Dwarf Athletic Association of America (DAAA; $N=583$, $M=1.1424$, $SD=0.46$) was the poorest rated DSO (Appendix E, Table 2).

Attitudes

Athletic trainers rated their attitudes toward disability sport as high (Appendix E, Table 3). The statement “There is a need for certified athletic trainers to gain more knowledge” was rated highest ($N=588$, $M=4.5442$, $SD=0.7959$), followed closely by

“certified athletic trainers should be employed at major disability sport events (N=591, M=4.5161, SD=0.7429), “certified athletic training services should be provided for athletes with disability who engage in competitive sport (N=590, M=4.4932, SD=0.7202),” and “athletic trainers should be employed by disability sport organizations full-time (N=587, M=4.1158, SD=0.9145).” Athletic trainers did not feel as strong toward the statements “undergraduate curriculum should include course work dealing with disability sport (N=590, M=4.0373, SD=0.9933)” and “athletic trainer's skills should be comparable with respect to caring for athletes with and without disability (N=587, M=3.8228, SD=1.0721).”

Relationship Between Perceived Competence and Attitudes

Is there a relationship between perceived competencies of certified athletic trainers and their attitudes related to disability sport service delivery? This relationship was examined using the Pearson product moment coefficient of correlation. There was a low positive ($r=.29$) relationship between the level of perceived competence and attitudes of ATCs related to disability sport service delivery. Thus, it can be stated that there is a low, positive relationship between perceived competencies of ATCs and their attitudes related to disability sport service delivery. However, the coefficient of determination shows that nine percent of the variance of the dependent variable can be explained by the independent variable while 91% is left unexplained. Other factors may be more influential on perceived competence such as lack of training, experience and administrative support.

Summary

Five hundred ninety-two (41.6%) ATCs completed the survey. Certified athletic trainers rated their perceived competencies toward disability sport low to fair (Appendix E, Table 2). ATCs felt most comfortable developing rehabilitation programs (N=592, M=2.39, SD=1.12) and assessing injuries incurred by athletes participating in disability sport (N=588, M=2.36, SD=1.16). ATCs were least familiar with legislation (N=584, M=1.47, SD=0.85), disability sport classifications (N=585, M=1.53, SD=0.85) and exercise modifications for athletes with atlanto-axial disorder (N=590, M=1.56, SD=0.94).

Athletic trainers rated their attitudes toward disability sport as high (Appendix E, Table 3). The statement “There is a need for certified athletic trainers to gain more knowledge” was rated highest (N=588, M=4.5442, SD=0.7959), followed closely by “certified athletic trainers should be employed at major disability sport events (N=591, M=4.5161, SD=0.7429),” “certified athletic training services should be provided for athletes with disability who engage in competitive sport (N=590, M=4.4932, SD=0.7202),” and “athletic trainers should be employed by disability sport organizations full-time (N=587, M=4.1158, SD=0.9145).” Athletic trainers did not feel as strong toward the statements “undergraduate curriculum should include course work dealing with disability sport (N=590, M=4.0373, SD=0.9933)” and “athletic trainer's skills should be comparable with respect to caring for athletes with and without disability (N=587, M=3.8228, SD=1.0721).”

There was a low positive ($r=.29$) relationship between the level of perceived competence and attitudes of ATCs related to disability sport service delivery. Thus, it can be stated that there is a relationship between perceived competencies of ATCs and their attitudes related to disability sport service delivery. Therefore, certified athletic trainers that do not have the knowledge and experience (rated competencies low) related to disability sport service delivery want to learn more (rated attitudes high) about disability sport concepts and athletic training service delivery towards athletes with disability.

Chapter 5

Discussion & Recommendation

The purpose of this study was to investigate the perceived competencies and attitudes of ATCs toward their service delivery and select concepts of disability sport. The survey instrument used for this research requires further development if utilized for further research. The pilot study utilized only 10 participants that did not yield a factor structure due to a lack of variance. A pilot study that surveyed more participants may have yielded a successful factor analysis because of an increase in variance between concepts. Instead, the survey instrument was further developed through expert review of content, structure, and level of understanding. As a result of the expert review, items were omitted or reworded and presented into three areas: foundation knowledge, primary disability sports concept, and secondary disability sport concepts. However, it is unknown how many weaknesses in the questionnaire could have been resolved with a more effective pilot study.

A Varimax rotated factor analysis of responses from the main study extracted four factors instead of the proposed three. Factor one, Foundation knowledge ($\alpha = .947$), accounted for 26.9% of the total variance and included questions 1, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, and 17. Factor 2, secondary disability sports ($\alpha = .871$), accounted for 20% of the total variance and included questions 20, 25, 26, 27, 33, and 34. Factor 3, primary disability sport concepts ($\alpha = .819$), accounted for 10.1% of the total variance and included questions 21, 29, and 32. The total variance accounted for in this study was 57% and items that did not factor into one of the three main factors were omitted.

This study aimed to answer three research questions asked prior to collecting data. These questions were: 1. How will certified athletic trainers perceive their competencies related to disability sport? 2. How will certified athletic trainers perceive their attitudes related to disability sport? 3. Is there a relationship between perceived competencies and attitudes of certified athletic trainers towards disability sport service delivery? Overall, ATCs rated their competence as poor to fair (1-2 on Likert scale). Such low ratings were expected since most athletic training education programs did not require adapted coursework upon graduation. Fifty seven percent (n=337) of ATCs surveyed noted that they had taken at least one class regarding disability sport or adapted physical activity. How could this be? This statistic certainly does not help the argument that ATCs lack knowledge toward disability sport because they lack formal adapted physical activity education. However, a closer look at the comparison of ATCs who have and have not taken an adapted physical activity class shows that ATCs who have completed at least one class rated their competencies toward disability sport concepts higher across the board than ATCs who have not completed one do (Appendix E, Table 4). For example, ATCs who have taken at least one adapted physical activity class (n=335) rated their competence toward disability sport assessment fair to moderate (M=2.60, SD=1.12) while ATCs who have not taken an adapted physical activity class (n=249) rated their competence fair (M=2.02, SD=1.11). Why do ATCs who have completed at least one adapted physical activity class rate their competencies fair to moderate? Only 17% of ATCs had been involved, by providing athletic training services, during a disability sport

event. Certified athletic trainers that have experience working at least one disability sport event rated their competencies toward all concepts higher than ATCs that have not worked a disability sport event (Appendix E, Table 5). For example, ATCs that have worked with disability sport ($n=102$) rated their competence toward disability sport injury assessment moderate ($M=3.04$, $SD=1.12$) while ATCs that havenot worked with disability sport ($n=486$) rated their competence toward disability sport injury assessment fair ($M=2.22$, $SD=1.12$).

These statistics show that ATCs who have taken at least one class and have experience working at least one disability sport event are more confident with their service delivery toward athletes with disabilities than ATCs that have not. Individuals rely on formal education and experience to gain confidence and competence (Chickering & Claxton, 1981). It can be speculated that ATCs perceived their competencies toward disability sport concepts low because they lack *both* formal adapted physical activity education and disability sport experience.

How will certified athletic trainers perceive their attitudes related to disability sport? Athletic trainers rated their attitudes toward disability sport as high (Appendix E, Table 3). The statement “There is a need for certified athletic trainers to gain more knowledge” was rated highest ($M=4.5442$, $SD=0.7959$), followed closely by “certified athletic trainers should be employed at major disability sport events ($M=4.5161$, $SD=0.7429$),” “certified athletic training services should be provided for athletes with disability who engage in competitive sport ($M=4.4932$, $SD=0.7202$),” and “there is a

need for athletic trainers to be employed by disability sport organizations full time ($M=4.1158$, $SD=.9145$).” Athletic trainers did not feel as strong toward the statements “undergraduate curriculum should include course work dealing with disability sport ($M=4.0373$, $SD=.09933$)” and “athletic trainer's skills should be comparable with respect to caring for athletes with and without disability ($M=3.8228$, $SD=.00721$).” The highly rated attitudes were expected because of the lack of knowledge perceived by ATCs. Certified athletic trainers want to have knowledge and skills necessary to provide athletic training service delivery to athletes with disability. Therefore, it was no surprise that ATCs agreed with the attitude statements such as “there is a need for certified athletic trainers to gain more knowledge,” “certified athletic trainers should be employed at major disability sport events,” “certified athletic training services should be provided for athletes with disability who engage in disability sport,” “athletic trainers should be employed by disability sport organizations full time” and “undergraduate curriculum should include course work dealing with disability sport.” Athletic trainers also noted that adapted physical activity courses should be optional as opposed to required in athletic training curriculum. However, with the NATA undergraduate athletic training curriculum changing from internship to an accredited educational program, it can be speculated that the student does not have many opportunities to enroll in elective classes. The rigid schedule that must be met may deter the student from enrolling in an adapted physical education course. However, it can also be speculated that since ATCs want to learn more about disability sport they would be willing to complete at least one course in

adapted physical activity. The NATA currently requires ATCs to complete 80 continuing education units (CEU) over a three year span, including completion of self-study courses. Human Kinetics Publishers has joined the NATA Research and Education Foundation to create the Professional Achievement Self-Study Program or PASS (Human Kinetics, 2004). Athletic trainers can purchase PASS courses through the Human Kinetics website, study the material received, and take a self-administered examination. The focus of PASS courses is “on active learning with exercises and materials to help you not only learn the material but also apply your knowledge to practice” (Human Kinetics, 2004). The courses offered included: *Management of bloodborne pathogens by athletic trainers, sudden death in sports, disordered eating among athletes, myofascial release in sports medicine, progressive rehabilitation of lower extremity injuries, pharmacology for athletic trainers, assessing and rehabilitating shoulder instability, psychology of sport injury, managing low back problems, and the hand and wrist in sport* (Human Kinetics, 2004). Currently, no PASS courses dealing with athletic training service delivery toward athletes with disability are available. The lack of options available in formal education, via required undergraduate courses and PASS courses, make learning about disability sport difficult. Therefore, ATCs would benefit from the development of a PASS course dealing with athletic training service delivery toward athletes with disability.

Is there a relationship between perceived competencies and attitudes of certified athletic trainers towards disability sport service delivery? This relationship was examined using the Pearson product moment coefficient of correlation. There was a low

positive ($r=.29$) relationship between the level of perceived competence and attitudes of ATCs related to disability sport service delivery. Thus, it can be stated that there is a relationship between perceived competencies of ATCs and their attitudes related to disability sport service delivery. However, the coefficient of determination indicates that nine percent of the variance of the dependent variable can be explained by the independent variable while 91% is left unexplained. Other factors may be more influential on perceived competence such as lack of training, experience and administrative support. The relationship between perceived competencies of certified athletic trainers and their attitudes related to disability sport suggests that ATCs want to learn more about disability sport concepts because they lack knowledge of disability sport concepts. With regards to this study, future research should examine the relationship between perceived competencies and lack of training and experience. Hypothetically, a stronger relationship may be seen between these two characteristics than that which was seen between perceived competencies and attitudes.

Future research should examine why ATCs do not provide services at disability sport events. Hypothetically, ATCs are not confident in their service delivery toward athletes with disability. Certified athletic trainers lack knowledge and skills to provide competent service to athletes with disability and, therefore, are uncomfortable doing so. Future research should continue to examine competence of ATCs toward disability sport service delivery especially with the implementation of CAAHEP Athletic Training Educational Programs. It can be speculated that the change to CAAHEP will promote

adapted physical activity education. Hopefully, the ideas of this research will guide future research aimed at promoting athletic training service delivery to athletes with disability as well as indicating a need for formal adapted physical activity education.

References

- Arnheim, D.D. and Prentice, W.E. (Ed.). (1993). *Principles of athletic training*. (8th ed.). St. Louis: Mosby Year Book.
- Birrer, R.B. (1984). The special olympics: An injury overview. *The Physician and Sportsmedicine*, 12(4), 95-97.
- Bloomquist, L.E. (1986). Injuries to athletes with physical disabilities: Prevention implications. *The Physician and Sportsmedicine*, 14(9), 97-105.
- Botvin-Madorsky, J.G., & Curtis, K.A. (1984). Wheelchair sports medicine. *The American Journal of Sports Medicine*, 12(2), 128-132.
- Burnham, R.S., Higgins, J., & Steadward, R.D. (1994). Wheelchair basketball injuries. *Palaestra, Winter*, 11(2) 43-49.
- Chickering, A.W. & Claxton C. (1981). What is competence? In Nickse, R. & McClure, L. (Eds.), *Competency-Based Education: Beyond Minimum Competency Testing*, (pp 8-21), New York: Teachers College.
- Commision on the Accreditation of Allied Health Education Programs (CAAHEP). (2001). *Accreditation Standards: Athletic Training*. Retrieved May 21, 2004, from, http://www.caahep.org/caahep/accredit.asp?doc=AT_SG_2001
- Costello, R.B. (Ed.). (1992). *Random House Webster's College Dictionary*. New York: Random House.

- Curtis, K.A., & Dillon, D.A. (1986). Survey of wheelchair athletic injuries-common patterns and prevention. In Sherrill, C. (Ed.), *1984 Olympic scientific congress proceedings: Vol. 9. sport and disabled Athletes* (pp. 211-216). Champaign, IL: Human Kinetics.
- DePauw, K.P. and Gavron S.J. (Eds.). (1995). *Disability and sport*. (pp. 142-149). Champaign, IL: Human Kinetics.
- DePauw, K.P. and Sherrill, C. (1994). Adapted physical activity: Present and future. *Physical Education Review*, 17 (1), 6-13.
- Deivert, R.G. and Megginson, N.L. (1995). Injury incidence of quad rugby athletes in national competition. *Palaestra*, 11(3), 8-9.
- Ferrara, M.S., Buckley, W.E., McCann, B.C., Limbird, T.J, Powell, J.W., & Robl, R. (1992). The injury experience of the competitive athlete with a disability: prevention implications. *Medicine and Science in Sports and Science*, 24, 184-188.
- Ferrara, M.S., & Buckley, W.E. (1996). Athletes with disabilities injury registry. *Adapted Physical Activity Quarterly*, 13, 50-60.
- Ferrara, M.S., Buckley, W.E., Messner, D.G., & Benedict, J. (1992). The injury experience and training history of the competitive skier with a disability. *The American Journal of Sports Medicine*, 20(1), 55-60.
- Gayle, G.W. & Muir, J.L. (1992). Roles of sportsmedicine and the spinal cord injured: A multidisciplinary relationship. *Palaestra*, 8(3), 51-56.

- Hedrick, B.H., Morse, M.I. & Figoni, S.F. (1988). Training practices of elite wheelchair road racers. *Adapted Physical Activity Quarterly*, 5, 140-153.
- Hoebrigs, J.H., Eggen, H.B.L., & Debets, P.M.L. (1990). Sports medical experiences from the international flower marathon for disabled wheelers. *The American Journal of Sports Medicine*, 18 (4), 418-421.
- Human Kinetics. (2004). *Distance Education*. Retrieved May 23, 2004 from Human Kinetics web site: <http://www.humankinetics.com/educate/pass.cfm>.
- Kegel, B. & Malchow, D. (1994). Incidence of injury in amputees playing soccer. *Palaestra, Winter*, 50-54.
- Kolb, D.A. (1980). Student learning styles and disciplinary learning environments: diverse pathways for growth. In Chickering, A.W. (Ed.) *The Modern American College*. San Francisco, CA: Jossey-Bass.
- Legwold, G. (1984). 'Pinky' Newell: the man who dropped the bucket and sponge. *Athletic Training*, 19 (4), 250-255.
- Liow, D.K. and Hopkins, W.G. (1996). Training practices of athletes with disabilities. *Adapted Physical Activity Quarterly*, 13, 372-381.
- Mangus, B.C. (1988). Medical care for wheelchair athletes. *Adapted Physical Activity Quarterly*, 5, 90-95.
- Mangus, B.C. (1987). Sports injuries, the disabled athlete, and the athletic trainer. *Athletic Training*, 22(4), 305-310.

- Massengale, J.D. and Swanson, R.A. (Eds.). (1997). *The history of exercise and sport science*. Illinois: Human Kinetics.
- McCormick, D.P. (1985). Injuries in handicapped alpine ski racers. *The Physician and Sportsmedicine*, 13(12), 93-97.
- McLean, J.L., Jr. (1968). Does the National Athletic Trainer's Association need a certification examination? *Journal of the NATA*, 3, 10-12.
- Megginson, N. L. and Lavay, B. (1998, October 3). *Perceived competency levels of adapted physical educators towards disability sport*. Study presented at the National Federation on Adapted Physical Activity, Minneapolis, MN.
- Megginson, N. L. and Lavay, B. (2001). Providing disability sport opportunities in adapted physical education. *Palaestra*, 17(2), 20-26
- National Athletic Trainer's Association (NATA). *National Athletic Trainer's Association: About NATA*. Retrieved October 9, 1999, from, <http://www.nata.org>
- National Athletic Trainer's Association (NATA). Athletic training education overview. Retrieved June 7, 2004, from, <http://www.nata.org/publicinformation/files/educationfactsheet04.pdf>
- National Athletic Trainer's Association (NATA). (2004). *The FACTS about certified athletic trainers*. Retrieved May 21, 2004, from, <http://www.nata.org/publicinformation/files/FactsaboutATCS.pdf>

National Athletic Trainer's Board of Certification (NATABOC). *National Athletic*

Trainer's Association Board of Certification: Certification Standards. Retrieved

November 20, 1999, from, <http://www.nataboc.org/standards.html>

Oliver, B. (1990). Defining competence: The case of teaching. *Journal of Teaching in*

Physical Education, 9, 184-188.

Poretta, D.L., Nesbitt, J. and Labanawich, S. (1993). Terminology usage: A case for

clarity. *Adapted Physical Activity Quarterly*, 10, 87-96.

Steadward, R. and Walsh, C. (1986). Training and fitness programs for disabled

athletes: Past, present and future. In Sherrill, C. (Ed.), *1984 Olympic scientific congress proceedings: Vol. 9. sport and disabled athletes* (pp. 3-17).

Champaign, IL: Human Kinetics.

United States Association of Blind Athletes (USABA). (1999). *Paralympic History*.

Retrieved May 9, 1999 from USABA web site:

<http://www.usaba.org/Pages/paratext.html>

US Paralympics. *About US Paralympics*. Retrieved April 5, 2004 from US Paralympic

web site: <http://www.usparalympics.org/usparalympics.htm>

Appendix A
Pilot Study Survey

Athletic Training and Its Role in Disability Sport Questionnaire

The purpose of this study is to investigate athletic trainers' attitudes and knowledge/competencies toward disability sport and the role of the athletic trainer within disability sport. Further inquiries regarding this study can be directed to Mark Fowler, ATC (510-293-0435; MTFowl@aol.com). Thank you very much for your participation in this investigation.

Please fill-in the following demographic information:

Age _____ Gender: (circle) M F Other Certificates? (PT, CSCS, etc.) _____

Highest Educational Degree Obtained/In what concentration: _____ Total # of YRS employed full-time in Athletic Training (check)

Degree (specify, MA, BS, etc): _____ less than 1
1-5
6-10
10+

Concentration (specify): _____

Current professional employment (check only one; Identify primary assignment)
 ___secondary ___community college ___university ___clinic
 ___other(specify): _____

Rate your professional knowledge/competency level for the following disability sport concepts using the following scale: 1=Poor; 2=Fair; 3=Moderate; 4=Good; 5=Excellent

1. Legislation (e.g. P.L. 95-606 'Amateur Sports Act') affecting sport opportunities for individuals with disabilities	1	2	3	4	5
2. Wheelchairs designed for sport	1	2	3	4	5
3. Properly fitted prosthetics and orthotics for disability sport participation	1	2	3	4	5
4. Disability sport injury assessment	1	2	3	4	5
5. Stabilizing (strapping) techniques for wheelchair athletes.	1	2	3	4	5
6. Taping and bracing for wheelchair athletes	1	2	3	4	5
7. Effects and potential side effects of medication (i.e. pain, anti-seizure, antispasmodic) on sport performance of athletes with disabilities	1	2	3	4	5
8. Medical concerns relative to athletes with spinal cord injuries (i.e. autonomic dysreflexia, thermoregulatory dysfunction, circulatory problems, decubitus ulcers, bladder/bowel issues)	1	2	3	4	5
9. Proper range of motion techniques for athletes with cerebral palsy	1	2	3	4	5
10. Exercise modifications for Atlanto-Axial disorder present in some athletes with disability	1	2	3	4	5
11. Ability to communicate using sign language	1	2	3	4	5
12. Developing appropriate training/rehabilitation programs for athletes with disability	1	2	3	4	5
13. Various disability sport athlete classifications	1	2	3	4	5
14. Organization and set-up of the medical team for disability sport events	1	2	3	4	5
15. Provision of athletic training services to athletes with:					
spinal cord injuries	1	2	3	4	5
amputation	1	2	3	4	5
cerebral palsy	1	2	3	4	5

1=Poor; 2=Fair; 3=Moderate; 4=Good; 5=Excellent

16. Disability-designed sports:

beep baseball	1	2	3	4	5
goal ball	1	2	3	4	5
quad rugby	1	2	3	4	5
wheelchair basketball	1	2	3	4	5
power soccer	1	2	3	4	5
sitting volleyball	1	2	3	4	5
other _____	1	2	3	4	5

17. Disability Sport Organizations and National Governing Bodies:

Deaf Sports Federation/USA	1	2	3	4	5
Dwarf Athletic Association of America	1	2	3	4	5
Disabled Sports/USA (DS/USA)	1	2	3	4	5
Wheelchair Sports/USA (WS/USA)	1	2	3	4	5
Special Olympics	1	2	3	4	5
United States Association for Blind Athletes (USABA)	1	2	3	4	5
United States Cerebral Palsy Association	1	2	3	4	5
National Wheelchair Basketball Association (NWBA)	1	2	3	4	5
United States Quad Rugby Association (USQRA)	1	2	3	4	5
National Beep Baseball Association (NBBA)	1	2	3	4	5
Other: _____	1	2	3	4	5

If you have been involved as an athletic trainer (ATC) for one or more of the above associations, please identify which one(s), what event(s), and your role.

Are you interested in gaining more knowledge/competency on Disability Sport as it relates to your role as an athletic trainer? (circle) Y N

Rate your attitude toward the following disability sport/athletic training statements using this scale:

1=Strongly Disagree; 2=Disagree; 3=Moderate; 4=Agree; 5=Strongly Agree

1. All students with disabilities, regardless of type or severity of condition, should be exposed and have opportunities in disability sport.	1	2	3	4	5
2. Athletes with disabilities should be allowed the highest quality of medical care while participating in their respective sports.	1	2	3	4	5
3. Athletic Training curriculum programs should include course work dealing with disability sport, common injuries/conditions, and treatment of injuries associated with athletes with disability.	1	2	3	4	5
4. Athletic trainers should be instrumental in the prevention, evaluation, and rehabilitation of sports related injuries incurred by athletes with disability.	1	2	3	4	5
5. Athletic trainers should be employed at major disability sport events and by disability sport organization (DSO) teams full time.	1	2	3	4	5

Appendix B
Human Subjects Letter

San José State
UNIVERSITY

**Office of the Academic
Vice President**

**Associate Vice President
Graduate Studies and Research**

One Washington Square
San Jose, CA 95192-0025

Voice: 408-924-2480

Fax: 408-924-2477

E-mail: gstudies@wahoo.sjsu.edu

<http://www.sjsu.edu>

TO: Mark Fowler
1439 West Street
Hayward, CA 94545

51

FROM: Nabil Ibrahim,
AVP, Graduate Studies & Research

DATE: February 29, 2000

The Human Subjects-Institutional Review Board has approved
your request to use human subjects in the study entitled:

“Perceived Competencies and Attitudes of
Certified Athletic Trainers Toward their
Role in Disability Sport”

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Nabil Ibrahim, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at
(408) 924-2480.

Appendix C
Consent Form

Dear Certified Athletic Trainer,

I am in need of your assistance in conducting a study as a part of my masters thesis concerning perceived competencies of athletic trainers toward disability sport. The results of this study will help me better understand certified athletic trainers' competencies/knowledge and attitudes toward select disability sport concepts.

I have enclosed a one page questionnaire (front and back) that will take approximately 15 minutes to complete. All information disclosed:

- 1). Will remain confidential and anonymous.
- 2). Will be viewed only by the researcher and the members of the thesis committee. Thesis committee members include Dr. Nancy Megginson, Dr. Leamor Kahanov, and Glen Borgeson, MS, ATC.
- 3). Will be securely kept at Mark Fowler's address.
- 4). May be published upon the completion of the thesis project. All information will remain anonymous and confidential.
- 5). No risks or benefits are associated with completing the questionnaire.
- 6). Consent to participate in this study is voluntary. You may refuse to participate in or withdraw from this study at any time, without prejudice from SJSU.

I would appreciate it if you could take 15 minutes out of your busy schedule to complete the enclosed survey. **Completion and return of the enclosed questionnaire constitutes consent to participate in this study. Please complete and return the enclosed survey by April 24, 2000.**

Each concept or statement is followed by a five point scale which will be used to rate competencies and attitudes toward select disability sport concepts. In section two, please rate your professional knowledge or competency level toward specific disability sport concepts using the following scale: 1=Poor; 2=Fair; 3=Moderate; 4=Good; 5=Excellent. Only one of the mentioned ratings can be selected. Section three consists of five attitudinal statements using another five point scale: 1=Strongly disagree; 2=Disagree; 3=Moderate; 4=Agree; 5=Strongly disagree. Any questions regarding this survey and subsequent research can be directed to Mark Fowler at (510) 293-0435 (MTFowl@aol.com). Complaints about the research should be presented to Dr. Carol Christenson (Department Chair, Human Performance). For questions or complaints about research, or subject's rights, contact Nabil Ibrahim, Ph.D, Acting Associate Vice President for Graduate Studies and Research, at (408) 924-2480.

If you would like a summary of the results obtained as a result of this study, please feel free to contact me at the number or email address listed above. Thank you for your time and participation in this study.

Professionally,

Mark Fowler, ATC
Graduate Athletic Training Student
San Jose State University

Appendix D
Main Study Survey

Athletic Training and Its Role in Disability Sport Questionnaire

The purpose of this study is to investigate athletic trainers' attitudes and knowledge/competencies toward disability sport and the role of the athletic trainer within disability sport. Further inquiries regarding this study can be directed to Mark Fowler, ATC (510-293-0435; MTFowl@aol.com). Thank you very much for your participation in this investigation.

Please fill-in the following demographic information:

- Age_____ •Gender: (circle) M F •Other Certificates?(PT, CSCS,etc.)_____
- Highest Educational Degree Obtained/In what concentration: _____
 Degree (specify, MA, BS, etc): _____
 Concentration (specify): _____
- Total # of YRS employed full-time in Athletic Training (check)
 _____less than 1
 _____1-5
 _____6-10
 _____10+
- Current professional employment (check only one; Identify primary assignment)
 _____secondary _____community college _____university
 _____clinic _____other(specify): _____

Have you taken any classes regarding disability sport or adapted physical activity? Y N (circle)

If yes, please indicate how many courses and at what level (Undergraduate, Graduate, Other)_____

Rate your professional knowledge/competency level for the following disability sport concepts using the following scale: 1=Poor; 2=Fair; 3=Moderate; 4=Good; 5=Excellent

1. Disability sport injury assessment	1	2	3	4	5
2. Organization of the medical team for disability sport events	1	2	3	4	5
3. Taping and bracing for wheelchair athletes	1	2	3	4	5
5. Stabilizing (strapping) techniques for wheelchair athletes.	1	2	3	4	5
5. Developing appropriate training/rehabilitation programs for athletes with disability	1	2	3	4	5
6. Exercise modifications for Atlanto-Axial disorder present in some athletes with disability	1	2	3	4	5
7. Wheelchairs designed for sport	1	2	3	4	5
8. Properly fitted prosthetics for disability sport participation	1	2	3	4	5
9. Properly fitted orthotics for disability sport participation	1	2	3	4	5
10. Potential side effects of medication (e.g., pain, anti-seizure, antispasmodic) on sport performance of athletes with disabilities	1	2	3	4	5
11. Medical concerns (e.g., autonomic dysreflexia, thermoregulatory dysfunction, circulatory problems, decubitus ulcers, bladder/bowel issues) relative to athletes with spinal cord injuries	1	2	3	4	5
12. Proper range of motion techniques for athletes with cerebral palsy	1	2	3	4	5
13. Legislation (e.g. P.L. 95-606 'Amateur Sports Act') affecting sport opportunities for individuals with disabilities	1	2	3	4	5
14. Various disability sport athlete classifications	1	2	3	4	5
15. Provision of athletic training services (e.g., rehabilitation, care and prevention) to athletes with:					
•spinal cord injuries	1	2	3	4	5
• amputation	1	2	3	4	5
•cerebral palsy	1	2	3	4	5

1=Poor; 2=Fair; 3=Moderate; 4=Good; 5=Excellent

16. Familiarity with disability-designed sports:

•beep baseball	1	2	3	4	5
•goal ball	1	2	3	4	5
•quad rugby	1	2	3	4	5
•wheelchair basketball	1	2	3	4	5
•power soccer	1	2	3	4	5
•sitting volleyball	1	2	3	4	5
•other _____	1	2	3	4	5

17. Familiarity with disability Sport Organizations and National Governing Bodies:

•Deaf Sports Federation/USA	1	2	3	4	5
•Dwarf Athletic Association of America	1	2	3	4	5
•Disabled Sports/USA (DS/USA)	1	2	3	4	5
•Wheelchair Sports/USA (WS/USA)	1	2	3	4	5
•Special Olympics	1	2	3	4	5
•United States Association for Blind Athletes (USABA)	1	2	3	4	5
•United States Cerebral Palsy Association	1	2	3	4	5
•National Wheelchair Basketball Association (NWBA)	1	2	3	4	5
•United States Quad Rugby Association (USQRA)	1	2	3	4	5
•National Beep Baseball Association (NBBA)	1	2	3	4	5
•Other: _____	1	2	3	4	5

Rate your opinion regarding the following disability sport/athletic training statements using this scale:

1=Strongly Disagree; 2=Disagree; 3=Moderate; 4=Agree; 5=Strongly Agree

1. Certified athletic training services should be provided for athletes with disability who engage in competitive sport.	1	2	3	4	5
2. Undergraduate athletic training curriculum programs should include course work dealing with disability sport, common injuries/conditions, and treatment of injuries associated with athletes with disability.	1	2	3	4	5
3. Athletic trainers' skills should be comparable with respect to caring for athletes with and without disability.	1	2	3	4	5
4. Athletic trainers should be employed at major disability sport events.	1	2	3	4	5
5. Athletic trainers should be employed by disability sport organizations full time.	1	2	3	4	5
6. There is a need for athletic trainers to gain more knowledge regarding disability sport.	1	2	3	4	5

If you have been involved as an athletic trainer (ATC) for one or more of the above associations or disability sport organizations (DSO), please identify which one(s), what event(s), and your role.

Are you interested in gaining more knowledge on Disability Sport as it relates to athletic training service delivery? Y N

Appendix E

Tables

Table 1: Primary Study Factor Matrix and Reliability Estimates	58
Table 2: Mean and Standard Deviation of ATCs' Competence Ratings by Factor	59
Table 3: Descriptive Statistics of Attitude Statements	60
Table 4: Comparison of Descriptive Statistics of Participants Enrollment in an Adapted Physical Activity Class	61
Table 5: Comparison of Descriptive Statistics of Participants' experience working with disability sport	62

Table 1Primary Study Factor Matrix and Reliability Estimates (Coefficient Alpha)

Factor	Factor Loading	Alpha
Foundation Knowledge		
Disability sport injury assessment	0.645	
Developing appropriate training/rehabilitation programs	0.718	
Exercise modifications for Atlanto-Axial disorder	0.703	
Wheelchairs designed for sport	0.605	
Properly fitted prosthetics for disability sport participation	0.733	
Properly fitted orthotics for disability sport participation	0.753	
Potential side effects of medication	0.663	
Medical concerns relative to athletes with spinal cord injury	0.759	
Proper range of motion techniques for athletes with CP	0.821	
Athletic training services to athletes with spinal cord injury	0.760	
Athletic training services to athletes with amputation	0.770	
Athletic training services to athletes with cerebral palsy	0.797	0.947
Primary (known) Disability Sports		
Familiarity with wheelchair basketball	0.607	
Familiarity with Special Olympics	0.767	
Familiarity with National Wheelchair Basketball Association	0.707	0.819
Secondary (unknown) Disability Sports		
Familiarity with Quad Rugby	0.553	
Familiarity with Deaf Sports Federation/USA	0.674	
Familiarity with Dwarf Athletic Association of America	0.772	
Familiarity with Disabled Sports/USA	0.687	
Familiarity with United States Quad Rugby Association	0.657	
Familiarity with National Beep Baseball Association	0.747	0.871

Table 2

Mean and Standard Deviation of ATCs' Competence Ratings by Factor

Factor	N	Mean	SD
Foundation Knowledge			
Developing appropriate training/rehabilitation programs	592	2.39	1.12
Disability sport injury assessment	588	2.36	1.16
Proper range of motion techniques for athletes with CP	592	1.97	1.19
Medical concerns relative to athletes with spinal cord injury	591	1.96	1.18
Athletic training services to athletes with spinal cord injury	589	1.94	1.12
Athletic training services to athletes with amputation	543	1.85	1.12
Properly fitted orthotics for disability sport participation	589	1.80	1.03
Wheelchairs designed for sport	591	1.80	1.03
Potential side effects of medication	590	1.79	1.01
Athletic training services to athletes with cerebral palsy	544	1.69	1.03
Properly fitted prosthetics for disability sport participation	592	1.66	0.98
Exercise modifications for Atlanto-Axial disorder	590	1.57	0.94
Primary (known) Disability Sports Concepts			
Familiarity with Special Olympics	590	2.67	1.28
Familiarity with wheelchair basketball	586	2.38	1.25
Familiarity with National Wheelchair Basketball Association	583	1.73	1.05
Secondary (unknown) Disability Sports Concepts			
Familiarity with Quad Rugby	584	1.42	0.89
Familiarity with Disabled Sports/USA	583	1.36	0.77
Familiarity with Deaf Sports Federation/USA	583	1.32	0.73
Familiarity with Quad Rugby	582	1.26	0.69
Familiarity with National Beep Baseball Association	580	1.21	0.87
Familiarity with Dwarf Athletic Association of America	583	1.14	0.46

Table 3Descriptive Statistics of Attitude Statements

Attitude	N	Min	Max	Mean	SD
Attitude 6 Gain Knowledge	588	1	5	4.5442	.7959
Attitude 4 Employed at DSO	591	1	5	4.5161	.7429
Attitude 1 AT Services	590	1	5	4.4932	.7202
Attitude 5 Employed FT	587	1	5	4.1158	.9145
Attitude 2 Curriculum	590	1	5	4.0373	.9933
Attitude 3 Comparable Skills	587	1	5	3.8228	1.0721

Table 4Comparison of Descriptive Statistics of Participants' Enrollment in an Adapted PhysicalActivity Class

Factor	Yes (N)	No (N)	Mean (SD) Yes	Mean (SD) No
Foundation Knowledge				
Disability Sport Injury Assessment	335	248	2.60(1.12)	2.02(1.11)
Developing Rehabilitation Programs	337	250	2.57(1.20)	2.13(1.18)
ROM Techniques for Athletes with CP	337	250	2.17(1.25)	1.70(1.05)
Medical Concerns	336	250	2.13(1.23)	1.72(1.04)
AT Services-SCI	335	249	2.10(1.16)	1.70(1.02)
AT Services-Amputation	305	233	2.05(1.22)	1.58(0.92)
Wheelchairs Designed for Sport	337	249	1.97(1.09)	1.55(0.88)
Properly Fitting Orthotics	334	250	1.95(1.12)	1.58(0.86)
Medicine Side Effects	337	248	1.90(1.09)	1.64(0.89)
AT Services-CP	305	234	1.83(1.11)	1.50(0.89)
Properly Fitted Prosthetics	337	250	1.83(1.07)	1.43(0.80)
Atlanto-Axial Exercise Modifications	335	250	1.69(1.69)	1.37(0.78)
Primary (known) Disability Sports Concepts				
Special Olympics	335	250	2.81(1.29)	2.48(1.25)
Wheelchair Basketball	333	248	2.65(1.25)	2.02(1.14)
National Wheelchair Basketball Association	329	249	1.93(1.16)	1.45(0.80)
Secondary (unkown) Disability Sports Concepts				
Quad Rugby	330	249	1.53(0.99)	1.27(0.69)
Disabled Sports/USA	329	249	1.47(0.88)	1.19(0.53)
Deaf Sports Fed./USA	329	249	1.42(0.84)	1.17(0.52)
US Quad Rugby Association	327	250	1.31(0.74)	1.18(0.59)
National Beep Baseball Association	327	250	1.28(0.68)	1.12(0.39)
Dwarf Athletic Association of America	329	249	1.20(0.56)	1.07(0.27)

Table 5

Comparison of Descriptive Statistics of Participants' experience working with disability sport

Factor	Yes (N)	No (N)	Mean (SD) Yes	Mean (SD) No
Foundation Knowledge				
Disability Sport Injury Assessment	102	486	3.04(1.12)	2.22(1.12)
Developing Rehabilitation Programs	103	489	2.85(1.20)	2.29(1.19)
ROM Techniques for Athletes with CP	103	489	2.35(1.22)	1.89(1.17)
Medical Concerns	103	488	2.34(1.20)	1.89(1.15)
AT Services-SCI	94	486	2.49(1.20)	1.82(1.07)
AT Services-Amputation	94	449	2.47(1.34)	1.72(1.03)
Wheelchairs Designed for Sport	103	488	2.42(1.16)	1.67(0.96)
Properly Fitting Orthotics	102	487	2.28(1.21)	1.69(0.96)
Medicine Side Effects	103	487	2.20(1.21)	1.71(0.95)
AT Services-CP	94	450	2.17(1.16)	1.59(0.97)
Properly Fitted Prosthetics	103	489	2.16(1.18)	1.56(0.91)
Atlanto-Axial Exercise Modifications	103	487	1.84(1.05)	1.51(0.91)
Primary (known) Disability Sports Concepts				
Special Olympics	103	487	3.43(1.22)	2.51(1.24)
Wheelchair Basketball	102	484	2.97(1.25)	2.26(1.21)
National Wheelchair Basketball Association	102	481	2.34(1.22)	1.60(0.96)
Secondary (unkown) Disability Sports Concepts				
Quad Rugby	102	482	1.94(1.34)	1.31(0.72)
Disabled Sports/USA	102	481	1.81(1.12)	1.26(0.64)
Deaf Sports Fed./USA	103	480	1.71(1.05)	1.23(0.61)
US Quad Rugby Association	101	481	1.64(1.13)	1.18(0.54)
National Beep Baseball Association	100	482	1.53(0.85)	1.15(0.48)
Dwarf Athletic Association of America	102	481	1.37(0.76)	1.09(0.35)