

What are Stated Gaps in Injury Prevention and Treatment Available on College Campuses for
Dancers?

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Abstract

This essay is dedicated to looking at the availability of medical assistance to dancers in the collegiate setting. Dance is a physically demanding activity with prolonged training timelines, however, there has been little dedication to the treatment and prevention of injuries in dance. The apparent lack of dedicated medical assistance dancers receive is what inspired this research. The objective was to better understand this lack and how it can be improved. It is important that dancers have resources available to help treat and prevent potential injuries, which will allow for longer and more fulfilling careers that do less chronic harm to their bodies. Based on a literature review contextualized further with first-person interviews, there are some opportunities that should be made accessible to collegiate dancers to help close this gap between the medical field and the dance industry. Recommendations include creating dance medicine facilities, providing cross training opportunities, creating experiences for athletic training or physical therapy students to learn about dancers as athletes, and prioritizing screenings for dancers. By creating resources that dancers can utilize and a comfortable environment where dancers can get help to treat and prevent injuries, this gap can be closed and could result in healthier dancers.

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Acknowledgements

Through my experience as a dancer who has sustained a few injuries, I have seen first-hand how helpful it can be to have a medical professional who understands dance and how rare it can be to find someone like that. I was specifically exposed to this field by Chris Rieger and Amanda Donohue. These two women have inspired me to choose a career path in which I can eventually become a healthcare professional who specializes in the treatment of dancers.

This research and essay would not have been possible without the help of my thesis director, Stevie Oakes, who guided me through this process and helped me develop this project which I have become very proud of. My parents, Linda and John Andrade have also been extremely supportive of my academic journey and path as a dancer.

Introduction

This research is dedicated to examining at the availability of specific and dedicated medical assistance to the dance community in the collegiate setting. In an article written by Jatin Ambegaonkar and Shane Caswell, they state that dance is a very physically demanding activity with prolonged training timelines and “despite the physical demands and rigor involved with dance, relatively little attention has been devoted to the unique health care needs of dancers” (J. Ambegaonkar & Caswell, 2009). This statement represents the lack of medical assistance dancers receive, which is what inspired me to do this research. I wanted to better understand this lack and how it can be improved. The dance population referenced in this writing has been narrowed to collegiate dancers who are studying predominantly concert Europeanist forms, such as ballet, modern, and jazz rather than generalizing to all dance. The reason this essay has narrowed its focus to these concert and Europeanist forms is two-fold: most scholarship in dance medicine and science focuses on these forms and the majority of university settings have continued to prioritize this “Western” training. In an article written by J. Bouey, it is mentioned that many BFA or MFA dance programs in this country require students to take forms such as ballet, modern, and contemporary in order to graduate with their degree. Other forms of dance that originated from cultures representing people of color such as hip hop, tap, and belly dancing are often offered as electives (J. Bouey, 2020). Making these forms that are predominately based in Western cultures a requirement demonstrates the emphasis collegiate dance programs place on concert dance. This is not to say that these forms of dance represent all dance or that other forms of dance are not equally as important. The purpose, aesthetic, and physical demand of dance forms depend on the genre and one or a few do not represent all dance forms that exist. So, because of the limited literature written about dance injuries and the fact that most of the

literature that does exist is written in reference to concert and Europeanist styles of dance, this essay has also narrowed its focus to only reference these styles at the collegiate levels.

This essay makes comparisons to collegiate athletic programs and the medical attention that is common for more traditional athletes playing at a university. By examining resources available to a similar age demographic and physical activity, the hope is to draw parallels while illustrating the distinguishing features and needs of each population. Dance has an aesthetic aspect that is not common in other sports; additionally, its training traditions and versatility differs from the training of other athletes. For example, when an athlete plays a specific sport, they train within the context of that sport. Dancers train within the context of different styles, which requires a variety of classes and instruction on learning the different techniques of each style. The purpose of comparing these two ideas is to highlight the differences in available medical treatment for dancers versus more traditional athletes. It seems commonplace for most athletes to have athletic training facilities, an athletic trainer who has studied the movement demands of that sport, and sometimes a physician or physical therapist available to the athletes at a university. By contrast, this is not something that is always made available for dance students, even at elite performing arts institutions and programs. According to the National Athletic Trainers' Association (NATA) website, every division of the National Collegiate Athletics Association (NCAA) employs athletic trainers. This makes the university setting one of the largest areas of employment for athletic trainers. Not only are they employed for NCAA sports teams, but also for "intramural, club and junior college athletic programs" (*College /University*, 2015). That essentially provides almost all collegiate athletes with some sort of dedicated medical resource. The same cannot be said for collegiate dancers. The statistics are drastically lower for dancers (J. Ambegaonkar & Caswell, 2009), and the impact will be discussed further

throughout the research. This is not to say that other athletes are not deserving of these resources. The comparison is simply used to make one question why it is not common for dancers to have access to these kinds of resources. Since all are considered athletes, why is their physical and mental health not given the same treatment opportunities as those who play a more traditional sport?

Because the majority of injury concern highlighted in dance medicine literature is orthopedic in nature, it is important for the medical resources available to both populations be tailored and specific. The roles of physical therapists and athletic trainers can seem very similar, but there are a few differences in their roles of treating athletes. The biggest difference between the two is that athletic trainers are trained in acute care and treat injuries the moment they occur, while physical therapists generally focus on rehabilitation over a longer period of recovery time. An athletic trainer is someone who majored in athletic training at a CAATE accredited university and passed the Board of Certification exam (Susan Wielgosz, 2020). Physical therapists currently need to graduate with a bachelor's degree from a university and a doctorate in physical therapy from a CAPTE accredited university. The job setting for an athletic trainer is typically in an athletic department, ranging from high school level athletics to professional athletic organizations, but can also include sports medicine facilities, performing arts companies, and industrial settings (Susan Wielgosz, 2020). The job setting for a physical therapist is much broader. They can work in an inpatient or outpatient setting and there are many specializations such as sports medicine, performing arts medicine, pediatrics, geriatrics, and cardiovascular.

This essay specifically looks at the treatment of dancers. Performing arts medicine involves the medical care of musicians and dancers (*Performing Arts Medicine Association | About*, n.d.). A dance medicine specialist is someone who specializes in the treatment of dancers.

Having a medical professional who specializes in the field in which an athlete is training in is beneficial because they can incorporate knowledge about the physical demands of the sport into their practices. Since dance is a unique form of physical activity that requires specific movement qualities and demands, it seems as though it would be useful to have someone who understands these differences offering medical assistance.

Statistics of Injury in Dance

Dance is an athletic art form that requires similar dedication and training that other traditional sports require. Due to the high training volume, lack of predictability of the season, and lack of periodization when it comes to training, dancers have the potential to injure themselves. The most commonly injured area for dancers is the lower extremities, especially in Western concert dance forms like ballet, modern, and contemporary. In a study performed by Emily Junck and associates, 164 dancers representing 210 injuries were evaluated to determine the level at which dancers were able to return post-injury. Some of the more common injuries that they saw were knee cartilage injuries, patellar tendon injuries, anterior hip pain, anterior cruciate ligament injuries, and ankle sprains. The injuries recorded in this study refer to any musculoskeletal complaints made by the dancers that led to a referral for physical therapy by a physician (Junck et al., 2017).

Dancers can also incur upper body injuries, such as shoulder joint and rotator cuff injuries, but the lower body tends to have the most demand placed on it in the dance setting, which makes it more susceptible to injury. In a study performed in the Netherlands in 2008 at the Medical Center for Dancers and Musicians, they found that the rate at which dancers sustain injuries is 50-97%. Most dancers retire due to physical declines by the time they are 30 years old (Mary Elizabeth Air, 2013). This study does not define injury within the context of their

research. This is something that seems necessary for this study and going forward when discussing injuries among dancers in other contexts. In an article published by the International Association for Dance Medicine and Science (IADMS), they define injury as an “anatomic tissue-level impairment as diagnosed by a licensed health care practitioner that results in full time loss from activity for one or more days beyond the day of onset.” They define the term “activity” within this definition as well saying that it is referring to “participation in a class, rehearsal, or performance” (W. M. Liederbach et al., n.d.). This seems like a comprehensive definition that could be used to define injury in contexts discussing the injuries sustained by dancers.

Overuse injuries are typical of dancers due to their extended rehearsal and class schedules and lack of recovery periods. Repetitive motions over these longer time periods can cause dancers to become fatigued. This fatigue may cause proper body alignment and efficiency of movement to become compromised which can eventually lead to chronic and insidious onset of injuries. Fatigue and exhaustion can also be a symptom of burnout. Burnout can result in fatigue, higher levels of exertion during class, inability to maintain execution of skills, feelings of depression, loss in appetite, and being more prone to injury (Yiannis Koutedakis, 2014). The root cause of overuse injuries and burnout is fatigue from lack of recovery periods after long duration physical activity.

Contributions to Injury Prevalence

Cultural

There are certain risk factors that can contribute to injuries in dancers. One of these risk factors is a lack of recovery. The sports world has a huge following and is widely popular among

the culture in the United States. In an article written by Dennis R. Howard and John L. Crompton, they state that in 2001, 123 franchises within the four major leagues in the United States and Canada had a market value of \$30 billion (Howard & Crompton, 2002). This value is sure to have gone up since 2001 because these leagues, along with new leagues, have since expanded. This large financial worth of the major league sports teams in the United States demonstrates the popularity and importance of sports to the culture of United States. Dance and other visual art forms do not receive the same level of cultural appreciation. Despite this, dancers are extremely dedicated to creating and perfecting their art. This dedication motivates them to consume their time and energy with practicing and rehearsing their craft. Unlike most traditional athletes, dancers aren't given an off season in which they can take time away from their training and recover. Fewer recovery periods can result in fatigue, which can be a risk factor for injuries. Students at universities studying dance are especially at risk for becoming "burnt out" because on top of their rehearsal and dance class requirements, they are also enrolled in academic classes that may consume any rest time they might have after a day of dancing (Dirickson, 2017).

According to an article written by Jeffery Russell, it is difficult to monitor and evaluate dance injuries because of the way in which they process pain. "They exhibit both a higher pain threshold... and a higher pain tolerance... than non-dancers" (Russell, 2013). This, along with fears of being misunderstood, and being told they cannot participate in class, rehearsals, or a performance, can result in a lack of reporting of injuries. Dancers can become so accustomed to dancing through their pain, they tend to associate it with their practice. According a study published in the *Journal of Dance Education*, dancers tend to self-treat their injuries or push through them because they fear that medical professionals will not understand the physicality of dance. As a result, pain is seen as something that is almost guaranteed when dancing. They are

accustomed to working through pain, which can later result in more severe injuries. This stems from a lack of knowledge on the dancers' end about the role of a physical therapist and a lack of knowledge on the physical therapists' end about dance vocabulary and dance movements (Lim et al., 2018).

Other factors than can contribute to injuries in dancers are the flooring of their dance space and their footwear. Floors that are raised up, or sprung, can “disperse some of the forces associated with dance, particularly in jumping and landing” (Russell, 2013). A study done by Wanke and associates, showed that 12.7% of injuries among professionals and dance students were caused by their dance flooring (Wanke et al., 2013). Having a slippery floor or a sticky floor can also result in injuries. Certain styles of dance require a shoe, like tap, and those shoes are designed to disperse force and help alleviate any injuries. Some styles require no footwear, which can contribute to leg, ankle, and foot injuries. When dancing en pointe, a ballet shoe with a wooden block in the toe is worn. An incredible amount of strength in the core and lower extremities is required to dance en pointe. Without this strong foundation, it is easy for dancers to hurt themselves (Russell, 2013).

It is common that dancers will injure themselves while trying to achieve the aesthetic nature of dance. For example, many dancers might force their turnout, or external hip rotation, in ballet, resulting in injuries to the knees, ankles, or low back. Another example of this is dancers sacrificing their technique or stability to find more range of motion, especially in the hips. Depending on the movement being performed, trying to increase range of motion in the hip by decreasing stability in the joint can lead to an injury of the ligaments, muscles, or tendons surrounding that joint. Ensuring that dancers are properly trained in these aspects is crucial to preventing injuries. Because the training traditions in dance largely stem from oral and artist

traditions rather than scientific ones, issues of alignment, efficient movement patterns, and individualized anatomy are largely the responsibility of the instructor to relay, rather than an allied healthcare practitioner, as is common in an athletic team. The aesthetic portion of dance also gives the idea that a dancer must look a certain way. In order to maintain this lean, ectomorphic look, dancers can make nutritional choices that may lead to eating disorders (Russell, 2013). These behaviors demonstrate the emotional and mental struggles dancers may face. It is important that dancers struggling with their mental health get the support and treatment they may need.

Psychosocial

It has been shown that negativity and stress can exacerbate, or even create an injury (Russell, 2013). According to Russell, ballet dancers that have a knowledge of psychological coping mechanisms experience fewer injuries (Russell, 2013). Other psychosocial tendencies that contribute to injuries include personality traits and perception of one's self. According to Marijeanne Liederbach in *Dance Medicine: Strategies for the Prevention and Care of Injuries to Dancers*, ballet dancers that suffered a large number of injuries over their career were identified as being more enterprising than dancers who did not sustain so many injuries. Stress fractures were another injury discovered to be common in dancers who were identified as being an overachiever (Marijeanne Liederbach, 2008). Based off these two pieces of information, it seems that those who have a deep desire for success and those who push themselves to their physical and mental limit in order to achieve success are more likely to sustain, or to have sustained, an injury. As mentioned earlier, negativity can cause an injury, but this negativity can be the result of deeper mental health illnesses such as depression and anxiety. 43% of dancers in the collegiate setting demonstrated symptoms of depression, such as feelings of hopelessness, concern about

their future, feeling unlucky, and not having enough time in their life to meet their goals (Marijeanne Liederbach, 2008). In a study performed by Elizabeth Patterson and associates, ballet dancers who had experienced negative life events had a higher chance of sustaining an injury in the future (EL Patterson & RE Smith, 1998). Another study, performed by Ronald E. Smith, found that 61% of dancers who suffered from injuries also had performance anxiety. Performance anxiety can increase cardiovascular and neuroendocrine activity, loss of focus, and worrying (Ronald E. Smith, 1996). This anxious mentality can stem from the pressure to perform well and the fear of failure in front of a larger audience.

In a study performed in the Netherlands in 2008 at the Medical Center for Dancers and Musicians, the Brief Symptom Inventory (BSI), a screening tool used to identify psychological distress, was used to discover that 60.1% of the dancers that participated in the study met the criteria for a referral to a clinical psychologist or psychiatrist. 46.6% of dancers demonstrated “above average” distress and 19.6% of dancers demonstrated “high” or “very high” distress levels compared to the general population (Mary Elizabeth Air, 2013). It seems clear that if a majority of dancers are meeting the criteria to be clinically referred to a psychologist or psychiatrist, there ought to be some dedication to providing this resource to collegiate dancers. The psychosocial health of a dancer is important for their success in dance as well as their individual well-being and should be prioritized, especially with such high statistics such as the ones stated by this study. Within the competitive dance environment, dancers tend to learn unhealthy characteristics like “workaholism, abnormal eating attitudes, body dissatisfaction, and low self-esteem” (Mary Elizabeth Air, 2013). Since the training occurs during developmental periods that are important for psychological development, it is common for dancers to self-identify with this “occupational identity” and develop these unhealthy psychological

characteristics (Mary Elizabeth Air, 2013). They tend to push the non-dance world away and hold focus on dance. In this study, amateurs had the lowest incidence of psychological symptoms that warranted clinical referral. This could be because these novice dancers are not yet exposed to the negative influences of the competitive dance environment and could actually reap psychological benefits from noncompetitive dancing (Mary Elizabeth Air, 2013). According to the study, “academy level-pre-professional students and professionals less than 25 years of age displayed the highest scores on the BSI, despite treatment” (Mary Elizabeth Air, 2013).

A lack of psychosocial support can also hinder a dancer’s recovery from an injury. Based on Junck and associates’ study, despite large numbers of dancers making a “full return to pre-injury level,” 59% of dancers reported “significant limitation attributed to either pain, loss of strength, ROM, or fear” after their injuries (Junck et al., 2017). The limitation due to fear led Junck and associates to the conclusion that psychosocial support may be crucial to returning dancers back to dance after an injury. Having emotional support available for dancers could be a preventative measure that could be taken by institutions wanting to prevent injuries among their dancers.

Perfectionism

Dancers tend to present with perfectionist tendencies. They set high standards and refuse to settle for anything less. In some sense, this need to set high expectations can be a positive thing. It can motivate dancers to work hard in order to succeed. It can also have negative outcomes, causing a dancer to mistreat their body and their mental health. The difference can be seen by defining the difference between striving for excellence and perfectionism. According to a resource paper published by IADMS, “striving for excellence is the pursuit of challenging yet attainable goals...perfectionism is the pursuit of perfection and, as such, is typically unrealistic

and not attainable” (*Resource Paper: Perfectionism - International Association for Dance Medicine & Science*, n.d.). In order to maintain a dancer’s well-being, it seems that striving for excellence would be more desirable than perfection.

Perfectionism and low self-confidence or low self-esteem have a direct relationship. The unattainable goals set by perfectionists only result in disappointment and feelings of inferiority. In the same resource paper by IADMS, dancers’ self-identification practices can be described as problematic:

If a dancer’s identity is tied up in dancing as the single most important activity in life and there is a belief one must do well as a dancer in order to be a good person, then the more fundamental construct of self-esteem is at serious risk. This is particularly important during times of stress. For a dancer with low self-esteem and high stress levels, chances are high that goals of perfect performance become overly demanding and upcoming shows feel like impending doom rather than exciting challenges (*Resource Paper: Perfectionism - International Association for Dance Medicine & Science*, n.d.).

Other relationships with perfectionism include disordered eating, anxiety, and burnout. The aesthetic value of dance causes dancers to constantly judge their appearance and to have their appearance evaluated by others, such as teachers and choreographers. This can lead to the development of eating disorders or excessive exercise in order to maintain a certain weight and body image. Professionally, there are some organizations that tie contracts to weight, body mass index (BMI), body composition, and other aesthetic requirements. These organizations include the Rockettes, some ballet companies, and some dance teams (Rollins, n.d.). This has trickled down to the collegiate level where some programs enforce weight regulations. Oklahoma City University is known in the dance community for their weigh ins that their dance majors partake

in monthly to ensure that they are meeting their weight requirements. If they do not, their grades will suffer, they are placed on probation until the requirement is met and can potentially be removed from the program. This kind of increased emphasis on body mass and weight can push students to pursue these unhealthy disordered eating habits and put their bodies at severe risks. After reviewing 644 dancers' injury reports, it was discovered that dancers who reported "fatigue, body dissatisfaction, drive for thinness, bulimic tendencies, and perfectionism" were more likely to have sustained an injury (Marijeanne Liederbach & Julietta M. Compagno, 2001).

According to the resource paper mentioned previously about perfectionism, published by IADMS, the anxiety comes from a lack of a sense of control. Not being able to achieve these unattainable goals can make dancers feel as though they don't have control over their own success. The feeling of not being good enough because their goals for themselves aren't being met can also induce anxiety. This can result in excessive training to meet these goals, which can ultimately result in burnout. The dancers can become both physically and mentally exhausted from the continuous push to achieve the unattainable (*Resource Paper: Perfectionism - International Association for Dance Medicine & Science*, n.d.).

All of these behaviors and tendencies can eventually lead to injury. The excessive physical workload being placed on the dancers with a lack of proper nutrition and an anxious mental state can all contribute to injuries. Overuse injuries are common in dancers and perfectionism demands a high level of frequency and duration in training. Doing too much of an activity fatigues the body and results in compromised technique and alignment, which in turn can cause injury (*Resource Paper: Perfectionism - International Association for Dance Medicine & Science*, n.d.).

Although dancers themselves can present with perfectionist tendencies, their teachers can also impart their own perfectionistic values on their students. This high expectation coming from the teacher puts the same mental and physical stress on a student as if a student were putting it on themselves. They can be made to feel inadequate or like a failure by their teacher, which relates to the traditions and culture of dance, because they cannot live up to the expectations set by the teacher (*Resource Paper: Perfectionism - International Association for Dance Medicine & Science*, n.d.). Ultimately, these high expectations, whether they come from the dancer themselves or other sources, and unachievable goals of perfection lead to unhealthy behaviors that can lead to injuries in dancers.

Treatment Availability

For most traditional collegiate and professional athletes, athletic trainers and athletic training facilities are available as a resource to treat and rehabilitate injury. First aid equipment, treatment tables, treatment equipment, such as STIM, heat, and ice machines, and mobility aids, such as crutches and boots, are some of the things that some athletic training facilities are supplied with that can be used to help treat their athletes to the fullest extent. Athletic trainers can also refer their athletes to sports medicine physicians who understand their needs and can evaluate them further and run diagnostic tests if necessary. This is a luxury that collegiate dancers are not typically offered. Despite the physical requirements and risk for musculoskeletal injury, dancers don't always have medical professionals available on campus for them to see or they don't have medical professionals who understand the demands of dance.

In an article written by Jatin Ambegaonkar and Shane Caswell, the authors outline the physical demand of dance with training that requires years of dedication. They state that “despite the physical demands and rigor involved with dance, relatively little attention has been devoted

to the unique health care needs of dancers” (J. Ambegaonkar & Caswell, 2009). This statement describes the lack of dedicated medical assistance that dancers are currently receiving. While the specialization of dance medicine exists, it is not current a large enough specialization to offer dedicated treatment to the all of the many collegiate and professional dancers.

According to Ambegaonkar and Caswell, there are 175 universities that offer dance classes. However, the access to dance medicine professionals, athletic trainers, and physical therapists is largely under documented (J. Ambegaonkar & Caswell, 2009).

In a study performed by Ambegaonkar and Caswell, emails were sent to the administrators of 175 institutions with dance programs to complete a survey about their current availability of medical care on campus and what their thoughts were on the need of medical care for their students. Of those 175 institutions, only 24 responded. 15 administrators reported that their institution offered medical services through the student health center on campus. Typically, these health centers are staffed with registered nurses and nurse practitioners. Registered nurses are qualified to administer medication, take vital signs, perform basic life support, feeding, dressing, performing hygiene, and ensuring patient safety (*Working as a Registered Nurse (RN)*, 2021). Nurse practitioners are qualified to order, perform, and interpret diagnostic tests, diagnose and treat acute and chronic conditions, prescribe medications, and provide education on disease prevention and health and lifestyle choices (*What's a Nurse Practitioner (NP)?*, n.d.). Based on these qualifications, registered nurses cannot offer the services a dancer would need when seeking treatment for an injury. While nurse practitioners can diagnose and treat injuries, it seems that someone with a background in sports or dance related injuries would be more beneficial to the dancer's recovery process. Also, student health centers would be unlikely to have access to equipment that would be necessary for treating an injury, which would potentially

end up in a referral to a physical therapist or athletic trainer. Looking at some of the universities in the Rochester area, SUNY, The College at Brockport's health center is staffed with registered nurses, nurse practitioners, physician's assistants, and mental health counselors (*Faculty & Staff Directory: SUNY Brockport*, n.d.). The University of Rochester's health center is staffed with physicians, nurse practitioners, and psychiatrists (*UHS*, n.d.). St. John Fisher College's health centers staff includes mental health counselors, psychiatric nurse practitioners, and registered nurses (College, n.d.). SUNY, Geneseo's health services staff includes physician's assistants, registered nurses, nurse practitioners, and a medical director, who has an MD (*Mission Statement / Meet Our Staff | SUNY Geneseo*, n.d.). While these types of medical professionals can offer some services to dancers, having access to an athletic trainer or a dance medicine or sports medicine specialist may be more beneficial to the treatment of their injuries. 6 administrators reported that medical services were offered by the intercollegiate athletics and 3 administrators reported that medical services were provided through an externally contracted agency, hired by the institution. The dance backgrounds and knowledge of dance is unknown about these individuals treating these dancers. 86.7% of administrators felt there was a lack of financial resources to accommodate these medical services (J. Ambegaonkar & Caswell, 2009). The financial burden of providing these services is a legitimate concern for these administrators and demonstrates the importance of funding for these crucial resources.

Language Barriers

Dancers can be trained to work through or dance through their pains. In dance culture, especially in past generations, dancers didn't come forward about their injuries. They knew going to a doctor would result in them being told to stop dancing. That is not an ideal treatment plan in most dancers' minds, so they often choose to ignore or deal with their pain on their own

terms, rather than working with a medical professional to treat their pain (Russell, 2013). They also tend to feel misunderstood by physicians, who likely don't know much about the physical demands of dance and the meanings behind the terminology of dance (Mary Elizabeth Air, 2013). According to the study performed by Mary Elizabeth Air, dancers tend to cite misunderstandings by physicians as their primary reason for not seeking immediate medical care after an injury (Mary Elizabeth Air, 2013). So, it seems that if this miscommunication between dancers and medical professionals could be mended, dancers would feel more comfortable seeking out treatment for injuries from healthcare professionals.

In a different study performed at Loma Linda University, a questionnaire about dance-related injuries, healthcare access, and the satisfaction with healthcare, was sent to dancers at 102 universities in the United States and they received responses from 211 students. 55% of these dancers sought out treatment from a medical professional and had a negative experience. 70% of those students felt misunderstood by the medical professional they sought treatment from, 43% were provided with unhelpful advice after seeking treatment from a medical professional. 41% of the dancers reported a positive experience after seeking treatment from a healthcare professional who had an established relationship with their university ("Investigators from Loma Linda University Zero in on Health and Medicine (A Tenuous Pas De Deux," 2019). Based on these results, it seems that dancers have a more positive experience while seeking treatment if there is a level of understanding about dance and the physical demands coming from the medical professional.

"80% of university dancers surveyed reported that they felt their health care providers did not understand dancers and 43% indicated that their health care providers gave unhelpful advice," according to a study performed by Russell and Wang (JA Russell & TJ Wang, 2012).

Many times, dancers are told by health care providers to stop dancing. This advice isn't something dancers are willing to take. It might be more beneficial for health care providers to learn more about dance medicine to understand the physical demands of dance and potentially come up with other solutions. In some cases, it may be necessary for a dancer to stop and recover with a long rest period, but if there is a way for other treatment options, those should be considered (Russell, 2013).

In an interdisciplinary educational experience at Stockton University involving 10 graduate doctor of physical therapy students and 10 dance majors, students across these two disciplines were given an opportunity to work together and learn from each other about what the other's role is in their discipline. According to both the dance and physical therapy students, the hardest part of the experience was the 'language barrier:' the dancers didn't understand terminology employed by the physical therapy students, and the physical therapy student didn't understand dance vocabulary. By participating in this interdisciplinary experience, they were able to learn and understand each other better, which makes for a more function relationship between medical professionals and dancers.

Relevance and Recommendations

Being able to return to dance, at the same level as when a dancer obtained an injury, is the ultimate goal of treating any dance injury and is necessary when looking to pursue a career as a professional dancer. In an article published in the *Journal of Dance Medicine and Science*, the authors note the fact that while a dancer is treating an injury, the results can be "missed auditions, lost pay, placement in less desirable roles, loss of continuing professional contracts, or limitations in dance ability that can be career ending" (Junck et al., 2017). These consequences can be seen in the collegiate level as well, with exceptions to the loss in pay and continuing a

professional contract. In an interview with Chris Rieger, she describes dancers at Syracuse University whose injuries resulted in a decline of their grades in their dance classes (C. Rieger, personal communication, November 15, 2019).

In a study conducted by Jae Hoon Lim and associates, the impact is further detailed: “Injuries in dance result in absence from classes, rehearsals, and performances...Cessation of dance can generate fear of inadequate improvement in technique, being out of shape, and loss of finances” (Lim et al., 2018). Comparatively, they note that other studies have shown that dancers practice schedules tend to be of longer duration than most professional athletes. These shorter practices for athletes allow for a longer rest and recovery period that dancers do not receive (Lim et al., 2018).

The issue that has been examined thus far is the gap between the medical field and the dance industry. While dance is a physically demanding activity that has the potential for the development of musculoskeletal injuries, there is a lack of available and dedicated treatment to dancers. There are some opportunities that should be made accessible to collegiate dancers to help close this gap between the medical field and the dance industry. Recommendations include creating more dance medicine facilities, allowing for participation alternatives, providing cross training opportunities, creating more experiences for athletic training or physical therapy students to learn about dancers as athletes, and prioritizing screenings for dancers. By creating resources that dancers can utilize and a comfortable environment where dancers can get help to treat or prevent an injury, this gap can be closed and could result in healthier dancers.

[Bringing Dance Medicine Facilities to Universities](#)

One of the potential solutions seems to be that the athletic departments at institutions with dance programs could offer their service to the dance students. However, according to

Ambegaonkar and Caswell's study, only 8 of the 24 administrators that responded to their survey "were willing to share costs with intercollegiate athletics" of these medical services with the athletic department (J. Ambegaonkar & Caswell, 2009). Without having knowledge of the financial situations of these institutions, it seems that financially, the medical assistance availability for dancers at the collegiate level needs to be made a priority (J. Ambegaonkar & Caswell, 2009).

56 of the institution administrators that responded to the survey reported having both and Athletic Training Education Program (ATEP) and a dance program. According to Ambegaonkar and Caswell, "an opportunity clearly exists for the athletic training profession to respond to the need of the performing arts community at colleges and universities... The dance program and its students receive the benefit of healthcare services...and the ATEP students receive the benefit of exposure to an emerging field of practice in athletic training" (J. Ambegaonkar & Caswell, 2009). Aside from the option of allowing dancers to see the same athletic trainers and use the same facilities as the athletes of the university's athletics program, some universities found the resources to create a dance medicine facility that is dedicated to treating dancers at their institution.

An example of a university that has created a dance medicine facility within their dance department is Brigham Young University (BYU). This school has the largest dance program in the United States with five departments and six performance teams. For many years, the members of the different dance teams had access to the school's athletic trainers when seeking treatment for injuries. They only were granted access, however, a few hours each day due to the high volume of intercollegiate athletes needing treatment. According to an article written by David A. Kaiser, Lee Wakefield, and Gaye Merrill, 68 dance related injuries were recorded in

the 1996-1997 academic year. This increased to 171 dance related injuries by the 1999-2000 academic year (Kaiser, 2002).

Due to the high volume of treatment that dancers specifically were receiving, the athletic training staff decided to propose that a dance medicine facility be built in the same building as the other dance facilities. This idea was approved by upper administrators and they converted four storage rooms into a 2,200 square foot facility. This facility is complete with mirrors, barres, an ice machine, resistance machines, a treadmill, a bike, a stretch station machine, and other equipment that would be useful for the staff to assess, treat, and rehabilitate any of the dancers' injuries. The facility has three certified, full-time athletic trainer and two to five athletic training students, who would get the chance to work in the facility to assist the athletic trainer as well as further their clinical education. Outside of the facility, the athletic trainers attend dance team competitions to assist with any injuries and to ensure the well-being of the students. They supervise conditioning and cross-training that the students participate in, as well as develop individualized conditioning programs. The goal of building this facility was to create healthier dancers and grow the success of the dance teams and dance department. It creates a space where the dancers know they can go to seek treatment and keep their bodies healthy and strong in order to perform at their peak (Kaiser, 2002).

This dance medicine facility at BYU is an example of the dedicated treatment dancers should be receiving. The sole purpose of the facility is to allow dancers to have access to treatment when they require it in a comfortable environment with staff who understands the physical demands being placed on them as dancers and athletes. This model is significant because it represents potential for other programs to invest in and build similar facilities. This does not come without barriers however. Although this seems like the best solution to providing

dancers with available medical treatment, it is not necessarily feasible for all dance programs in the United States to create a facility such as this one. Obstacles such as funding, finding space for this type of facility, and finding staff who specialize in dance medicine will be easier for some schools to overcome than others. So, while this is an excellent resource and solution to the gap between medical treatment and collegiate level dancers, it is not necessarily something that all dance programs are able to develop. I would suggest further research be done to determine which elements are the most effective for smaller programs to consider in order to make dance medicine facilities more adaptable for programs with different resources.

According to an article published by *Dance Teacher Magazine*, the Joan Phelps Palladino School of Dance at Dean College is one of 10 institutions that has this type of resource available to them. Amanda Donohue, the school's athletic trainer, is able to help treat injuries of the dancers and also collaborates with faculty in technique classes to help prevent injuries and to help the dancers build strength. The school of dance was able to decrease the number of sustained injuries from 65% to 35% in the six years following Donohue's employment at Dean College (*Here's What Happened When Dean College Brought an Athletic Trainer into Technique Classes*, 2019). Some of the benefits from this model are Donohue's specialization in dance medicine, her collaboration with other dance faculty, and the physical space and time dedicated to the dancers of the school. Donohue's specialization in dance medicine allows for her to understand the biomechanics and physical demand of dance and form treatment plans that will help a dancer recover from an injury and gain strength as they move forward in their career. Her collaboration with other faculty members allows for her to understand exactly what is being taught in the classroom so she knows more specifically what movements are being executed and what demand is being placed on the dancers' bodies. The dedicated space and time to the dancers

of the school allows for a more attention to be placed on the dancers. Since they are not sharing space, equipment, or staff with other athletes, they are able to have more opportunities to treat injuries and more focus placed on them and their medical needs.

In an article written by Jatin Ambegaonkar, she describes how a dance medicine program and facility was established at the University of North Carolina at Greensboro (UNCG) and what it provides to their dance students. The UNCG Dance Medicine Program began in January 2004 and provides athletic training to any student enrolled in a dance class at UNCG. The program is meant to meet the medical needs of dance students at the university and form a connection between the dance department, the athletic training department, the student health center, and the exercise and sport science department. They offer emergency care, comprehensive rehabilitation services, health care services, and can refer students to physicians, specialty clinics, and diagnostic services, such as X-rays. The services are offered on an appointment basis; however, walk-ins are also accepted. They offer services 3 days a week for a total of 8 hours. Generally, some universities are offering their dancers educational lectures about injury prevention and other important healthcare topics that pertain specifically to dancers. BYU does this by having the athletic trainers occasionally hold classes to teach student about health and fitness related subjects (*Dance Medicine and Wellness Facility Scheduling*, n.d.) and UNCG does this by having their ATCs dedicate time to appear as a guest lecturer in dance classes in order to teach students about dance injuries and how they are treated (J. P. Ambegaonkar, 2005). This type of education is an important part of helping dancers prevent injuries and understand how to take care of their bodies and their well-being, both physically and mentally. This knowledge seems useful for all dancers to learn about, especially at the collegiate level. This program at UNCG is not only benefitting the dancers who are able to seek treatment

for their injuries, but also for ATCs and anyone performing research for the School of Health and Human Performance at UNCG. This opportunity to work in this setting allows for a clinical experience in a “nontraditional setting” and in the field of dance medicine and provides access for researchers to a “unique, physically active population” (J. P. Ambegaonkar, 2005). To clarify the term “nontraditional setting,” when athletes are injured during a game or match, they are brought to the athletic training room at the complex they are playing at for further evaluation and acute treatment. When dancers are injured during a show or performance, they do not necessarily have access to this kind of dedicated space. Occasionally, a green room or dressing room may be turned into a make-shift treatment room or a massage table may be placed backstage. There isn’t necessarily going to be a dedicated space to treating an injured dancer and there may not be a healthcare professional, such as an athletic trainer, available to treat any injuries during a performance. This lack of dedicated space and staff to treating dancers during a performance is what makes their setting more nontraditional than other sports.

One of the specific benefits of this model is that it allows for the athletic training department and students who use it for a clinical experience to play a role in helping to provide medical assistance to the dancers at the university. This kind of work helps to educate these healthcare professionals on dancers as athletes and how they can help this population receive the medical assistance they need. Educating not only dancers about their own bodies, but also those who are currently working as healthcare professionals allows for more available and dedicated resources for dancers to seek treatment from.

Having this facility and program makes the university competitive and increases national and international recognition. For anyone who wants to research or learn more about dance medicine, UNCG is offering a location that allows people to do just that. The potential of making

this a clinical site as well has the opportunity to draw more people into this school and increase interest in their programs.

While building a dance medicine facility at a university doesn't come without its obstacles, it is potentially the best solution to closing the gap between the medical field and the dance industry. Those institutions that have the resources to create, staff, and equip a dance medicine facility should make it a priority to do so. The foundation of these dance medicine facilities is the dedication to the treatment of dancers and employing healthcare professionals who specialize in dance medicine or understand what the demands of dance are. Creating a space that is easily accessible for dancers and has healthcare professionals who understand them as athletes allows them to have an available resource to safely treat injuries.

Technique Participation Alternatives and Pilates

There are many ways that dance students can still participate or improve their technique while being injured. An article published by IADMS outlines three evidence-based options for students to continue their dance education while being injured. The first way is participating while modifying movements in class. Depending on the injury, students can continue to take class with modifications to prevent further injury. This allows dancers to continue dancing, feel involved in their classes and rehearsals, and have an opportunity to learn about their injury and what their limitations are based on their injury. The second option is considering alternative forms of participation, to include written note taking, mental practice, and assisting the teacher or choreographer. These observational skills can help students make goals for themselves and obtain a different perspective of the classes or rehearsals they are partaking in. The last method the IADMS article highlights centers around finding useful alternatives to class attendance and participation. Working on conditioning and somatic practices are ways that a dancer can continue

to work on their technique and improve as a dancer while healing from an injury (Weiss, n.d.). Options such as Pilates are useful alternatives to class participation. Pilates is often used as a cross training method for dancers because it focuses on developing important muscles dancers use frequently and has a history of being popular among dance communities.

Physical training outside of dance classes can help to reduce injuries in dancers. Although a dancer may be in class for multiple hours a day most days of the week, typically movement in a class is not sufficiently long enough to improve aerobic endurance. Because of this, it may be beneficial for dancers to participate in cross training activities that allow for dancers to improve their aerobic endurance outside of dance classes. In a study done by Jennifer R. O'Neill and associates, they found that dance students are active at a moderate to high intensity for 10 minutes per hour of class (O'Neill et al., 2012). A study done with professional ballet dancers showed that dancers who participated in a fitness program along with their regular classes showed an increase in maximum oxygen uptake and decreased psychological stress, which as discussed earlier, can lead to injury. While fitness programs that focus on aerobic endurance have certain benefits, muscular strength and power are also important training adaptations that dancers should develop for certain movements, such as explosive jumps. Pilates is currently popular among the dance community and is an example of a physical training method that dancers can use to increase muscular strength and power and prevent injuries.

Michelle Pritchard is the owner of Evolution Pilates in Pittsford, New York and works with dancers frequently. A majority of her staff members are former dancers and through her staff and teaching a Pilates course at Nazareth college within the dance department, she has first-hand experience teaching the Pilates method to dancers. She also teaches a certification course that has a dance specific focus that allows her to train individuals with a dance background to

become certified Pilates instructors. In her experience, dancers are able to learn Pilates quickly due to their developed fine motor control and ability to perform coordinated movements at an advanced level. Generally, she states that dancers have a lot of flexibility and a large range of motion in their spines, which can be helpful for more advanced movements, but can also result in a lack of stability, especially in their core. While it depends on the dancer, since everyone has different strengths and weaknesses and is built differently from a physical perspective, unilateral work is something that is important for dancers to look at to determine which side of their body may be stronger and weaker. This allows them to focus on finding a balance and strengthening those weaker sides. Full body integration exercises are also great for dancers because it allows dancers to work multiple muscles in different ways, which is a common physical demand in dance. Abdominal exercises also allow for full body integration and can increase control and stability. Pritchard believes that hamstring strength through hip extension exercises is important for dancers to develop because they are frequently jumping and moving in and out of the floor, which is a general dance concept that means level changes that move the dancer in and out of contact with the floor. Lastly, she says that arm and upper body strength is also important for partner work, for dancers supporting their own bodies, and for movements that require moving in and out of the floor. Pritchard says the Pilates method, due to its abundant list of exercises, is useful for both injury prevention and injury rehabilitation (Michelle Pritchard, personal communication, March 6, 2021). Since Pilates is a method that can allow dancers to use their strengths, such as flexibility and coordination, while also helping them strengthen areas they tend to be weak in, it makes Pilates a great cross training method for dancers to use to prevent and rehabilitate injuries.

Closing the Language Barrier

Referring to the Stockton University study mentioned earlier, 20 students took part in this interdisciplinary educational experience, of which 10 students were dance majors and 10 were graduate doctor of physical therapy students. The purpose of this experience was to teach the dancers more about injury prevention and the physical therapy students more about the nature of dance related injuries. The overall purpose was to “explore dynamic interaction between student dancers and graduate physical therapy students in a structured learning environment regarding prevention of dance injuries” (Lim et al., 2018) and achieved by several key aspects of the experience: Some of the parts of this experience included physical assessments of the dancers, including the use of the Functional Movement Screen (FMS), ballet classes in which the dancers participated in class and the physical therapy students observed, and Pilates classes in which all students participated. Including the assessment allowed dancers to better “see” themselves from a physical therapy perspective; the observation of the ballet class allowed for the physical therapy students to understand the rigor and the movements associated with a dance class, and the Pilates classes were used to teach new exercises that “were designed as a supplement to conventional physical therapy exercises” (Lim et al., 2018). According to both the dance and physical therapy students, the hardest part of the experience was the language barrier: the dancers didn’t understand terms that the physical therapy students used, and the physical therapy student didn’t understand dance vocabulary. According to the study, research has shown that medical professionals rarely communicate with dance teachers or choreographers about treating dancers, and dancers rarely ask further questions about their injuries because they don’t understand the medical terminology (Lim et al., 2018). If more experiences like this were made available and more dancers and medical professionals were willing to learn from one another,

this interdisciplinary experience could be a model for a solution to the gap in medical assistance availability to the dance community.

Pritchard, who was mentioned earlier, co-teaches a class at Nazareth College with a faculty member from the physical therapy department and a faculty member from the dance department that focuses on learning about anatomy through a somatic lens. They learn about their anatomy by reading and looking at pictures in a textbook, as most traditional anatomy classes are structured in an academic setting, but they also learn about their anatomy by palpating, meditating, and moving. One of the goals of this course is to introduce physical therapy students, who have learned extensively about anatomy and physiology, to this somatic lens of anatomy and allowing them to experience the feeling of moving these anatomical structures. The other goal is to introduce dance students, who may only have experienced anatomy through an experiential lens, to their anatomy through a more academic lens. The dancers and physical therapy students are paired together in the hopes that they will learn from each other and learn about anatomy from the other person's perspective (Michelle Pritchard, personal communication, March 6, 2021).

The Dancer Wellness Program at Case Western Reserve University was developed to help dancers, dance teachers, and medical professionals understand the physical demands of dancers and how to help them maintain their overall health and wellness. The goals listed by the program include helping dancers train effectively and efficiently, injury prevention, resources and information that will help in the rehabilitation of injuries and developing and providing medical professionals with data that can help them understand the physical musculoskeletal demands of dance. There are three parts to this program. The first part is kinesiology and introductory seminars. In this part, dancers are taught principles of kinesiology and

biomechanics, strengthening and stretching exercises, nutrition and injury prevention. The second part of the program is screening. Each dancer completes a biomechanical assessment at the Ohio Physical Therapy Clinic to assess their “areas of strength, range of motion, cardiovascular health, and body composition” (*Dancer Wellness Program – Department of Dance*, n.d.). Each year, the dancers are rescreened to monitor their progress and keep up to date records on their physical health. The last step is individual assessments. Each dancer meets with a physical therapist to create an individualized training plan. Simply creating this connection is important for dancers and clinicians. This program then takes this connection deeper by providing an educational experience that allows clinicians and dancers to learn about the treatment of dancers and the biomechanics of dance. The screening part of the program is likely the most easily replicable piece of the program and highlights the importance of screenings to get a full understanding of a dancer’s health history and to identify how the physical demands of dance are affecting their bodies.

Screenings

Injury reporting is common in the sports community. It allows for the athletic trainers or other professionals that treat them to understand more about their previous and current injuries. A similar system that focuses specifically on the demands of dance and healthcare needs of dancers needs to be implemented. The purpose of reporting injuries is to “document over a specified period of time the number and nature of injuries that occur to dancers in a particular setting” (M. Liederbach & Richardson, 2007). With information about the number and nature of injuries, institutions can use that information to understand what the risks are and what needs to change in order to prevent injuries from occurring (M. Liederbach & Richardson, 2007).

Screenings are important in helping dancers maintain a healthy physical and mental state. As an aggregate of data, they can be used to gain information about a dancer in order to prevent injuries, improve performance quality and create training programs to further aid in the success of a dancer. Individually, screenings establish baseline data for medical professionals to identify areas of potential weakness and provide evidence-based programming to help prevent injury incidence. Another benefit of screenings is introducing dancers to a medical professional that they can get to know and who can get to know them. This gives them a safe person to reach out to if they ever are struggling physically or mentally with their dance training (Karen Potter et al., 2008). Although screenings have not been proven to predict the risk for injury, further research and more screenings being performed on dancers could help give more insight into prevention of injury and illness in dancers and how their wellness can be better improved (Karen Potter et al., 2008). There are different factors that are useful to understand when deciding what kind of screening needs to be done. One of those factors is the dancer's strengths and weaknesses, which will allow for the development of unique training programs to help efficiently train the dancers on an individual basis. Progress evaluation is also a factor; by performing multiple screenings, healthcare professionals can identify any changes in the dancer to ensure that they are progressing appropriately and that their records are up to date (Karen Potter et al., 2008).

Implementation and the feasibility of implementing screening processes is another important factor when deciding the kinds of screenings that can be performed within a program. It is important to first understand space available for screenings, the type of dancer or dancers being screened, the time in which the screening will take place, the personnel available to perform screenings and the purpose of the screening results. Types of screenings include medical, musculoskeletal, fitness, technical dance skills, psychological, and nutrition. Each type

serves a different yet important purpose in learning more about a dancer's health. The medical screening can be performed by a physician osteopath, physical therapist or physiotherapist, or athletic trainer. It is used for general health screenings, gives a medical history background, and determines if there are any structural abnormalities. A musculoskeletal screening can be performed by a physician, osteopath, physical therapist or physiotherapist, chiropractor, or athletic trainer. It is used for determining injury history, physical assessment, range of motion, strength, and muscular imbalances. A fitness screening can be performed by an exercise physiologist, a physical therapist or physiotherapist, or an athletic trainer. It can be used to determine body composition and cardio-respiratory response. A technical dance skill screening can be performed by a dance teacher or any qualified healthcare provider. It is used to determine dance training history, core stability, fundamental motor skills, and dance technique ability. A psychological screening can be performed by a psychologist or a psychiatrist. It is used to gain insight on a dancer's anxieties, self-esteem, and any mental health issues such as depression. A nutrition screening can be performed by a nutritionist or a dietician. It can be used to learn more about a dancer's eating habits (Karen Potter et al., 2008). All of these types of screenings have the potential to give medical professionals valuable information about a dancer, but it is not realistic to assume all programs will be able to provide all of these types of screenings. By understanding the different types of screenings, clinicians can determine which are the most important and which types can be implemented into the program. The types of screenings that could be used is also dependent upon the accessibility to certain medical professionals and what types of screenings they are qualified to perform and the space available to perform screenings.

In the study performed in the Netherlands in 2008 at the Medical Center for Dancers and Musicians, referenced previously, the BSI, a screening tool used to identify psychological

distress, was used to determine psychological distress rates and levels in collegiate dancers. This is an example of a screening tool that could be used to help treat dancers on a psychological basis. This is an important type of screening for dancers because, as mentioned previously, dancers are susceptible to suffering from psychological distress due to perfectionist tendencies and other pressures placed on them (*Resource Paper: Perfectionism - International Association for Dance Medicine & Science*, n.d.). While physical screenings are also essential, psychological distress can have a significant impact on dancers' wellbeing, performance, and physical health. Implementing this screening tool into universities with dance programs can allow faculty to see if dancers are in need of professional psychological help.

Conclusion

The focus of this research was to shed light on the current availability of medical resources to dancers at the collegiate level and identify potential solutions to bridging the gap between the medical field and the dance industry. While progress has been made to increase the availability of dedicated medical resources to dancers, there is still more work to be done. One of the first steps in making this happen is research. There is a lack in research and literature on the topic of dance injuries and the kinds of resources that are currently being made available to them. By creating more studies and performing more research, additional data will become available to help further the work being done to help dancers in need of medical treatment. Implementing strategies, such as creating dance medicine facilities, providing cross training opportunities, creating experiences for athletic training or physical therapy students to learn about dancers as athletes, and prioritizing screenings for dancers, will also allow for more education in the field of dance medicine and reduce the gap between available medical resources and dancers. This

population of collegiate level dancers deserve to have a place or resource that they can easily utilize to help them treat and protect their bodies as they push forward in their careers as dancers.

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