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Dancer Screening Clinic

Kristen Manaloto

University of Nevada, Las Vegas

John Lencioni

University of Nevada, Las Vegas

Laura Nguyen

University of Nevada, Las Vegas

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DANCER SCREENING CLINIC

By

John Lencioni
Kristen Manaloto
Laura Nguyen

A doctoral project submitted in partial fulfillment
of the requirements for the

Doctor of Physical Therapy

Department of Physical Therapy
School of Integrated Health Sciences
The Graduate College

University of Nevada, Las Vegas
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Doctoral Project Approval

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This doctoral project prepared by

John Lencioni

Kristen Manaloto

Laura Nguyen

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Doctor of Physical Therapy
Department of Physical Therapy

Casey Turner, Ph.D.
Research Project Coordinator

Kathryn Hausbeck Korgan, Ph.D.
Graduate College Interim Dean

Daniel Young, Ph.D.
Research Project Advisor

Merrill Landers, Ph.D.
Chair, Department of Physical Therapy

Abstract

Dance students at the University of Nevada, Las Vegas (UNLV) do not have access to sports medicine specialists, thus a pro-bono dance clinic was created as a service-learning project by the UNLV Department of Physical Therapy (UNLVPT) in 2018. In the second year of the service-learning project, three graduate students from the UNLVPT program, under the supervision of a clinical faculty member, have continued to provide free dance specific injury prevention screenings and management to students within the UNLV Department of Dance. To improve clinic operation and services, the group emphasized communication and accessibility as areas of growth.

Injury prevention screenings consisted of analysis of dance specific movements, joint integrity, cardiovascular performance, lower body strength, and an eating attitudes survey. Additionally, dance students could schedule for a comprehensive physical therapy examination and subsequent treatment sessions for any acute or chronic injury. Treatment interventions included manual therapy and therapeutic exercise. Emphasis was placed on patient education for injury prevention. Dancers were also provided home exercise programs specific to the objective findings during examination.

From the Fall 2019 to Spring 2020 semester, 3 screenings, 7 initial evaluations and 8 treatment sessions were completed. Due to COVID-19, the dance clinic ceased its in-person services and thus the project pivoted to provide educational resources for the dancers. Despite challenges from COVID-19, the clinic provided an opportunity for dance students to be exposed to dance specific orthopedic conditions and screenings, as well as demonstrate the ability for the service-learning project to grow from previous cohorts to continue providing a needed and valuable service to an underserved population at UNLV.

Table of Contents

Abstract	iii
List of Figures	v
Background.....	1
Purpose and Goals.....	3
Methodology (Subjects, Instrumentation, and Procedure)	4
Clinic Outcomes.....	6
Challenges.....	8
Reflection.....	9
Conclusion	15
Appendices.....	17
References.....	36
Curriculum Vitae	39

List of Figures

Figure 1. Categories of Injury with Definitions	20
Figure 2: Eating Attitudes Survey.....	21
Figure 3: Beighton Hypermobility Test.....	23
Figure 4: Brighton Criteria.....	24
Figure 5 Scoring for Muscle Flexibility Test.....	25
Figure 6: Scoring for Dance Based Movement Performance	26
Figure 7: Single Leg Step Down Test.....	28
Figure 8: Scoring for Single Leg Stance.....	29
Figure 9: Heart Rate Values and Norms for 3-Minute Step Test	31

Background

Compared to other forms of physical activity and sport, dancers experience one of the highest injury rates, with 80% to 97% of university, professional ballet, and modern dancers experiencing at least one musculoskeletal injury per year (Davenport et al., 2016). A synergistic orchestra of muscle strength, balance, coordination, flexibility, speed, and cardiovascular endurance is vital to meet the demands of dance (Armstrong & Relph, 2018). As intensity and difficulty increases, dancers must navigate increased ground reaction forces and mechanical loads (Armstrong & Relph, 2018). Injuries may result due to the high forces generated in conjunction with pushing the limits of joint range of motion (Armstrong & Relph, 2018).

A typical elite pre-professional or professional ballet dancer dedicates 20 to 39 hours per week in classes and rehearsals in addition to performances (Biernacki et al., 2018). Despite this time spent training, rehearsing, and performing, the intensity of these activities does not provide adequate stimulation to result in aerobic fitness (Twitchett et al., 2009). As a result, dancers exhibit low aerobic fitness levels in contrast to the high aerobic demands of dance, most notably during performances (Bronner et al., 2016; Twitchett et al., 2009, 2010). Due to a lower aerobic fitness level, dancers are more likely to fatigue because of their decreased ability to recover between bouts of high-intensity activities (Twitchett et al., 2010). Injuries can result from persistent fatigue, consequently pre-professional dancers with low aerobic fitness levels are more susceptible to injury than those with higher levels of aerobic fitness (Bronner et al., 2016). Among dance injuries, 57% to 78% of injuries are related to overuse (Yau et al., 2017). A common consequence of injuries is restriction from participation, measured as time lost from dance (Caine et al., 2015). In a retrospective study that spanned a course of over 8.5 months, pre-professional dancers reported an average time loss of 14 days per injury (Caine et al., 2015). The recovery timeline may be extended

when dancers fail to disclose injury or decide to dance through the pain (Biernacki et al., 2018). Students within the University of Nevada, Las Vegas (UNLV) Department of Dance have echoed this point by being hesitant to use the University's health center due to a fear of recommended time off from dance. Students of the UNLV Department of Dance do not have direct access to sports medicine providers, while the UNLV Cheerleading and Dance Team do. Providing an accessible environment for dancers to disclose their injuries early may prevent more serious problems from developing (Biernacki et al., 2018; Bronner & Bauer, 2018).

An obstacle to developing a strong screening protocol with good predictive value is the limitation in dance specific research and the lack of prospective studies providing evidence-based support for dance screening practices (Armstrong & Relph, 2018). Armstrong and Relph (2018) concluded that future dance screening studies need to be prospective, use predictive statistics, identify confounders, include reliability, and provide a specific definition of injury. In a review conducted by Bronner and Bauer (2018), Brighton score, dance technique motor control, muscle tightness, and history of injury within the previous year were factors that increased risk for musculoskeletal injury within pre-professional modern dancers. For example, a single general movement screen, such as the Functional Movement Screen (FMS), may not be predictive of injury among dancers due to a lack of specificity (Bronner & Bauer, 2018). This is likely because the FMS does not assess the biomechanics required for jumping and landing which are critical to dancers (Bronner & Bauer, 2018). Therefore, a dance specific screening instrument is needed (Armstrong, 2019).

Additionally, disordered eating may contribute to a dancer's injury risk (Thomas et al., 2011). Eating disorders have been associated with increased fracture rates in dancers, especially at the ankle and foot, due to diminished bone mineral density (Thomas et al., 2011). At the same

time, time-loss injuries may increase risk for developing an eating disorder due to pressure to maintain a body type with specific aesthetic features for dance (Thomas et al., 2011). The Eating Attitudes Test (EAT-26) is a widely used standardized tool to identify characteristics of eating disorders (Arcelus et al., 2014). The EAT-26 does not diagnose eating disorders, but rather indicates risk and the possible need to refer to an appropriate healthcare professional (Garner, 2010). Screening dancers for injury risk should thus include both a specific movement screen and a disordered eating screen like the EAT-26.

Purpose and Goals

The purpose of this service-learning project was to provide a free service to the students of the UNLV Department of Dance, to fulfill a need for dance specific injury prevention and management. Now in its second year, there are four goals of the UNLV Physical Therapy (UNLVPT) Dancer Screening Clinic: (1) to identify common risk factors associated with injury, (2) to reduce overall incidence of injury by combining patient education and skilled physical therapy intervention, (3) to improve clinic operations and offered services, and (4) to form effective partnerships with departments at UNLV such as the School of Medicine. An emphasis on accessibility and efficient communication will help build a stronger trust between departments and create more seamless care.

Moreover, the benefits of the clinic are applicable to the education of graduate students in the UNLV Doctor of Physical Therapy (DPT) program. Participation in the UNLVPT Dancer Screening Clinic can be part of a service-learning project to fulfill the UNLV DPT curriculum requirement in DPT 798 Directed Research. By conducting screenings and performing evaluations and treatment sessions with supervision from a licensed physical therapist, UNLVPT students gain experience and potentially improve their clinical reasoning skills. Working with dancers of

different backgrounds such as modern and ballet, exposes UNLVPT students to a variety of orthopedic conditions and challenges them to create interventions that are specific to the requirements of dance. This service-learning project also challenges student physical therapists to analyze the needs of their local community, find value in collaboration, and contemplate the barriers of the healthcare system.

Methodology (Subjects, Instrumentation, and Procedure)

Graduate students from the UNLV DPT program have been working in conjunction with the UNLV Department of Dance to provide dance specific screenings, evaluations, and treatment sessions to students enrolled in dance classes. As a preparation for the Dancer Screening Clinic, our group of UNLVPT students participated in three MedBridge continuing education courses created by renowned dance medicine specialist, Dr. Shaw Bronner, PT, PhD, OCS, on dance specific screening and ballet technique to ensure our knowledge with dance.

Advertising was used to increase awareness of the services offered by the clinic. Beginning in the Fall semester of 2019, advertising strategies were implemented including visiting dance classes, posting flyers around campus, and emailing reminders within the UNLV Department of Dance. Following the advertisement process for the clinic, the schedules of the dancers, UNLVPT students, and supervising physical therapist were coordinated to determine the most optimal times to perform the screenings. The dancers emailed UNLVPT students to schedule screenings, initial evaluations, and treatment sessions. These appointments were coordinated via a Google Calendar. Appointment times were available Monday to Friday. Participants received reminders via their preferred method of contact (email or text) one day prior to their scheduled appointment.

Prior to the screening, the dancers completed an intake form (Appendix A) that included personal history, dance/performance history, exercise history, and injury history. In addition, the

dancers filled out the Eating Attitudes Test (EAT-26) (Appendix B). We then conducted the screening which consisted of seven tests:

- Beighton Scale (Appendix C)
- Brighton Criteria (Appendix D)
- Muscle Flexibility Restriction (Appendix E)
- Dance Based Movement Performance (Appendix F)
- Single Leg Step Down Test (Appendix G)
- Single Leg Stance (Appendix H)
- Accelerated 3-Minute Step Test (Appendix I)

Dancers were presented with the results of the screening and were provided education on the identified limitations and injury risk factors. If a dancer was believed to benefit from a comprehensive physical therapy evaluation, the dancer had the option to schedule an appointment for an initial evaluation at a future date. One of the students from our group, with the supervision of a UNLVPT faculty member who is a licensed physical therapist, conducted a complete physical therapy evaluation and then provided intervention and/or referral to meet the needs of the dancer. Dancers were also able to request a formal physical therapy evaluation without a prior screening. Following a screening or initial evaluation, dancers were provided with an individualized home exercise program (HEP) via email and a TheraBand if indicated.

UNLVPT students from the preceding cohort who had worked on the Dancer Screening Clinic were consulted and specific changes were implemented based on their reported successes and failures. A significant issue in the past had been scheduling appointments and sending appointment reminders. Previously, the 10to8 software (*10to8 Leading Online Appointment Scheduling Software*, n.d.) was used which did not have good features for coordination of the

dancers' schedules with the UNLVPT students and supervising physical therapist. To ensure the availability of the chosen appointment time, email and Google Calendar were implemented for scheduling during the clinic's second year. For appointment reminders, dancers were contacted based on their preferred method of communication. Additionally, the method of documentation was changed from handwritten to electronically typed which improved organization and efficiency. We solicited feedback from the dancers following their appointments via administration of a survey (Appendix J) to evaluate the quality of service and care provided. The survey was incorporated to receive feedback pertaining to scheduling, communication skills, and overall satisfaction. Additionally, there were questions made specific to a dancer's experience depending on which services they utilized from the clinic.

As part of our project, we communicated with UNLVPT students in the succeeding cohort to help them continue the Dancer Screening Clinic. We provided suggestions to maintain and improve the effective partnership with the UNLV Department of Dance. We recommended that interviews with relevant stakeholders within the UNLV Department of Dance be arranged to seek input on ways to enhance the clinic. Additionally, we recommended marketing to other university departments such as the UNLV School of Medicine to facilitate opportunities for interprofessional education and care. To further develop the identity of the clinic, the creation of a logo, motto, and core values were suggested to the following group of student physical therapists. We feel this will inform UNLV dancers of the UNLVPT commitment to ongoing high-quality service.

Clinic Outcomes

During our group's efforts, from Fall of 2019 to Spring of 2020, we completed: 3 screenings, 7 initial evaluations, and 8 treatment sessions. Common dancer problems identified from the screenings included muscle flexibility restriction of the rectus femoris and iliotibial band.

Impaired proprioception, muscle strength, and motor control were also observed during the Single Leg Stance, with dancers averaging 23.8 seconds on the left lower extremity and 14.0 seconds on the right lower extremity. The dancers often failed the Single Leg Step Down Test by rotating at the pelvis in the transverse plane, elevating or dropping the hip in the frontal plane, moving the knee medially in the frontal plane, and leaning the trunk to either side to recover balance. Consistent with the poor pelvic position during the Single Leg Step Down Test, the dancers presented with decreased lumbopelvic stability during dance-based movements. Of the screenings conducted, one dancer requested for a formal initial evaluation. The remaining six initial evaluations were requested without a prior screening.

From the initial evaluations, common physical therapy diagnoses involved the lumbar spine and lower extremity. The dancers who were evaluated presented with low back pain (LBP), high ankle sprain, medial tibial stress syndrome, and calf muscle strain. One dancer who was evaluated post-elbow dislocation was advised to visit her orthopedic surgeon prior to scheduling treatment sessions with us. The remainder of the dancers who requested an initial evaluation scheduled a future treatment session. Each dancer's plan of care was individualized to address the main barriers to full and safe participation in dance activities.

Treatment interventions included manual therapy and therapeutic exercise. Manual therapy techniques included sports massage, passive stretching, and instrument assisted soft tissue mobilization. Therapeutic exercises were chosen based on acuity of injury, physiological demands of dance, and deficits found during screening or evaluation. Dancers were instructed on exercises in the clinic as well emailed exercise packets with detailed descriptions for each exercise.

Challenges

The challenges that the UNLV Dancer Screening Clinic continued to encounter in its second year include limited availability to perform services and limited participation and feedback from the dancers. The classes and personal schedules of the supervising physical therapist, the UNLVPT students, and the dancers, did not often align, limiting scheduling options to Fridays in most cases. The dancers often inquired about scheduling on the weekdays. This is difficult because the Dancer Screening Clinic shares space with the UNLVPT program. There are three classrooms used for instruction within the UNLVPT program which are occupied most of the time on weekdays. Although there was available time between classes of the UNLVPT students, there was never available space to conduct the screenings, initial evaluations, or treatment sessions. This barrier of limited space and time likely contributed to the limited participation of the dancers. Despite advertising strategies at the beginning of each school semester, there was not an increase in utilization of the Dancer Screening Clinic. Throughout the 2019-2020 academic year, there was difficulty establishing work-flow consistency for the clinic secondary to fluctuating interest in scheduling appointments. Additionally, of the eight dancers that utilized the clinic's service, only three provided feedback through the survey. It was difficult to assess the clinic's strengths and weaknesses and to adjust according to the dancers' needs with so few comments available.

In March of 2020, UNLV suspended in-person instruction and shut down the campus in response to the global COVID-19 pandemic. As a result, the UNLVPT Dancer Screening Clinic also suspended its in-person services. To remain a service to the UNLV Department of Dance, a pre-recorded lecture entitled "Strength and Conditioning Considerations for the Performing Artist" was created and presented to students in the UNLV Department of Dance as part of their online curriculum. The lecture focused on the importance of strength and conditioning for dancers to

achieve optimal performance and health. The lecture aimed to address common myths that deter dancers from participating in strength and conditioning by presenting current evidence to support its role in dance (Williams et al., 2016). To encourage strength and conditioning, the lecture concluded with exercises targeting key musculature utilized in dance as a starting point. The faculty mentor of this service-learning project, who is both an ex-professional dancer and licensed physical therapist, joined the dance program professor in an online Instagram Live, to discuss the topics of the recorded presentation and answer questions from students or faculty in the UNLV Department of Dance. An Instagram account for the UNLV Dancer Screening Clinic was created to serve as an education resource beyond the presentation. Instagram served as an education tool to allow the dance clinic to continue to provide dance specific injury prevention education while social distancing guidelines and campus restrictions were in effect.

Reflection

A key component of service-learning is reflection through reflective writing. We participated in reflection as a group before and during the experience and as individuals after the experience. Reflecting as a group helped us to share ideas and build a cohesive team. We utilized an aspect of Janet Eyler's reflection model as the basis of our reflections before, during, and after our service-learning project (Eyler, 2002).

Pre-Project Reflection

When we were initially assigned to this service-learning project, we had a genuine interest in working with the dance population and providing a needed service for the performing arts community at UNLV. Hearing the experience of previous UNLVPT students involved with the Dancer Screening Clinic allowed us to continue what worked and to try to improve what had not worked. Prior to conducting screenings, evaluations, and treatments, our group was fearful about

the possible lack of participants due to the concern of the previous group about minimal awareness. As a group we do not have a professional dance background contributing to fear that our limited knowledge could impact the quality of care we deliver. We met several times as a group and discussed ideas for the clinic including development of a better marketing strategy via branding and accessibility. In addition, our meetings focused on the development of the organization of the clinic by transitioning to efficient scheduling and documentation. Lastly, we were excited to expand the services of the clinic by increasing our involvement with UNLV College of Fine Arts.

During Project Reflection

As a group, we felt similarly about what went well and what limitations we faced. Beginning with what went well, our chosen method of scheduling and sending appointment reminders and home exercise programs (HEP) seemed to address the problems previously encountered by former UNLVPT students. Additionally, transitioning to electronic documentation helped the organization of screening results and evaluation and treatment notes which led to efficiency and consistency when providing care. Lastly, we felt our established system was effective when working with the dancers. Each individual in our group had an assigned role during the screening, evaluation, or treatment session which promoted a good workflow. Prior to every scheduled appointment, we discussed what role we wanted which gave each of us equal opportunity for participation and exposure to the screenings, evaluations, and treatment sessions.

We experienced barriers that we can use as lessons when advising the next cohort. Due to our class schedules, our mentor's schedule, and the dancers' schedules, we felt rushed and limited throughout the week. We often had to schedule appointments between classes which at times felt rushed as we had to transform the classroom to the clinic then back to a classroom again. Also, the number of initial evaluations compared to screenings was unexpected. Given the known value of

screening protocols, we had hoped to conduct more screenings to reduce the risk for injury. We were disheartened as we were only able to offer appointments for one day at the beginning of the Spring semester of 2020 before we were informed that we would be unable to return to campus due to COVID-19, which left us to figure out alternative methods to provide our services to the dancers. Adversity opens a door for opportunity, and we look forward to finding ways to extend our services in a socially distanced fashion during our remaining time with this project. Just as our profession is adjusting, we will learn from this experience and come out the other side better for having gone through it.

Post-Project Reflections

John's Reflection

Part of the UNLVPT educational philosophy is an onus of responsibility on the student for taking accountability for their own learning. The program emphasizes that students are responsible for making choices and accepting the consequences. Taking accountability for one's education and career experiences is a value I believe in. In the spirit of that philosophy, I knew it was important to choose a culminating project that I thought would aid my education and give me an experience of additional value to my time at UNLV.

I was first drawn to the dance clinic service-learning project because I had shared a similar experience with the students of the UNLV Department of Dance. Throughout my athletic career in both high school and college, I played on teams that did not have access to any sports medicine professionals. Direct access to sports medicine professionals is a luxury not all have, and especially when performing or competing at a high level, it can make a huge difference in an individual's ability to recover from an injury. Through this project, things have come full circle and I have been able to serve in a role that I wish I were afforded while playing sports.

Another benefit of this project was the ability to apply my newly acquired dance specific knowledge on my first clinical rotation. I had a patient who was a professional dancer, and I utilized a dance specific return to jumping protocol that impressed the patient and my clinical instructor. I could tell the patient had more buy in with my programming because I was able to speak in their language and they understood the direction relationship of rehab and their dance performance.

Education is a critical component of service-learning projects. As physical therapists, we have unique knowledge and skill that makes us experts in movement. I think the greatest value of our service-learning project was the time spent educating the dancers on injury prevention, recovery, and general wellness. There is a lot of misinformation in the sports performance world, but taking time to explain mechanisms of injury, recovery strategies, strength, and conditioning principles or whatever was relevant to the individual, in simple patient friendly terms, allows the patient to not only become more involved in their recovery, but gave them a better foundation to make more informed decisions about their body in the future.

Kristen's Reflection

Personally, being a part of the UNLV Dancer Screening Clinic has been a reward. A common reason among DPT students and my reason for choosing the profession of physical therapy is to serve people in our community through optimizing their function. I became aware of the underserved dance community at the university I attended for my undergraduate and graduate degree, and to be able to help my peers is gratifying. The dancers we met responded to this service-learning project with enthusiasm. They shared stories of not having access to care and being fearful they would be told to stop dancing, but we listened to their concerns and we helped them continue achieving their passion. The UNLV Department of Dance, its faculty and dancers were genuinely

grateful for the clinic. Seeing the results of the education and treatment we provided revealed that a screening protocol works. Additionally, working with this specific patient population allowed me to improve my clinical reasoning skills. Reflecting on my performance as a student physical therapist, I see that creating advanced treatment plans is a weakness; however, through this project I developed my skills with the assistance of my mentor and classmates. I am appreciative of being part of a team that has established a fruitful work environment where we constantly teach and learn from one another. As future DPT students continue the clinic, I hope they are able to increase its reach. Our group experienced struggles recruiting dancers for screening, but those dancers that used our services did benefit. The Dancer Screening Clinic is truly a value to the UNLV dance community.

Laura's Reflection

The UNLVPT dance clinic has been quite a learning experience filled with many surprises. It was satisfying to be a resource for the UNLV Department of Dance, as many of them expressed the difficulties in the past of accessing providers who would immediately instruct them to stop practices and performances indefinitely. Additionally, it was beneficial for them to be informed of the deficits they had and to be instructed on how to address them. Due to the unforeseen circumstances of COVID-19, we were initially uncertain on how to continue to be a source for the dancers. However, we were able to use virtual options mentioned in the Challenges section. The ability to adjust to unexpected circumstances is an important characteristic for me as a future clinician and I feel that I've done this well throughout the service-learning project. It was also a surprise to receive more requests for initial evaluations and treatments rather than screenings. It is imperative that we inform the next cohort to continue stressing the importance of screenings to the dancers.

Next Steps Reflection

The students from the next UNLVPT cohort who will advance the Dancer Screening Clinic into its third year should continue to advocate for the students of the UNLV Department of Dance. Participation from the dancers was scarce and likely attributable to the challenges regarding availability of time and space, in addition to lack of awareness of the services. The next cohort should seek additional means to emphasize the importance of screening to prevent potential injuries rather than evaluate and treat existing injuries. The Instagram account that was created in response to the COVID-19 pandemic is a recommended platform for the next cohort to advertise for the clinic and use as an educational resource. UNLVPT students can record and upload educational videos or photos to Instagram on a regular basis as a resource for dancers. The content will focus on injury prevention of the common deficits included in published literature as well as what was identified in the screenings from the clinic's second year.

As our group and the previous UNLVPT group faced challenges with scheduling and availability, this will be resolved with the newly acquired room from the UNLV College of Fine Arts. The Dancer Screening Clinic will be able to provide its services at the UNLV College of Fine Arts Consortium for Health and Injury Prevention (CFA-CHIP) Clinic which will be available to dancers and other performing artists. With a dedicated space within the UNLV College of Fine Arts, this may allow for familiarity and access to dance specific equipment which may increase scheduled appointments and participation.

Lastly, continuing to obtain feedback from dancers will continue to enhance the Dancer Screening Clinic. We would have benefited from a greater response from the dancers we saw. Although the clinic's services are directly for the dancers, future plans should consider a survey

for the dance instructors in order to provide additional insight on demands and expectations from their perspective.

As future cohorts of UNLVPT students participate in the Dancer Screening Clinic service-learning project, there will also be new cohorts of dancers joining the UNLV Department of Dance. It is crucial to both that we continue promoting awareness of the services that are offered and to learn and adjust from the challenges of previous groups.

Conclusion

In order to fulfill the requirements for the UNLV Doctor of Physical Therapy (DPT) program, a student must complete a capstone project in the form of a traditional research project or a service-learning project. The service-learning project is intended to serve the local community as well as make an impact on the health of an underserved population. In the second year of the Dancer Screening Clinic, three student physical therapists attempted to continue to deliver high quality evidence-based care for students within the UNLV Department of Dance.

UNLVPT students used knowledge from their physical therapy curriculum as well as a literature review and dance screening education course to conduct an evidence-based screening that was specifically designed to analyze common impairments demonstrated in dancers. Providing this screening was an attempt to fill a gap in healthcare for students of the UNLV Department of Dance with limited access to sports medicine professionals.

Part of the service-learning experience was writing both group and self-reflections. A common theme in each student's reflection was accessibility to healthcare. The students of the clinic sympathized with the dancer's reports of poor experiences with healthcare, due to a lack of medical professionals with both sports medicine and dance specific knowledge. The reflection also highlighted the opportunities that the clinic provided such as developing more sound clinical

reasoning and creating advanced and individualized interventions for the dancers. UNLVPT students also worked through the challenges of organizing the clinic and found recruitment and scheduling appointments to be the main barriers of the clinic's growth.

COVID-19 changed the course of the service-learning project, and the student physical therapists were challenged to produce creative solutions in a socially distanced world. The result was an emphasis on educational resources for the dancers featuring an in-depth review of strength and conditioning considerations as well as the creation of an Instagram account.

Despite the unforeseen challenges of COVID-19, progress was made at the Dancer Screening Clinic. The current students shared the lessons they learned and served as mentors to the next group of students to ensure carryover into the next year. Although the sample is small, future groups can build on this projects' outcomes and look for trends of common dancer impairments. This could lead to future research opportunities, advanced screening techniques, and/or collection of normative data for dancers.

Appendix A

DANCE INTAKE FORM

Personal History

Name _____ Today's date: _____

Date of Birth _____ Gender M / F

Email: _____ Phone: _____

What is the best way to contact you? Email / Text / Call

Height _____ Weight _____

Ethnicity African American / Asian / Hispanic / Caucasian / Other _____

Education High school / College / Graduate school

Year in school? Freshman / Upperclassman Expected graduation date _____

Hand dominance R / L Smoking Y / N

Rate present state of health: Good / Fair / Poor

Please check all conditions that apply to you:

_____ high blood pressure _____ diabetes _____ stroke

_____ epilepsy/seizures _____ heart disease _____ asthma

_____ dizziness/fainting _____ cancer _____ arthritis

_____ scoliosis _____ stress fractures _____ fatigue associated with exercise

_____ shortness of breath _____ chest pain _____ allergies: specify _____

Do you take any medication? Y / N

If female: Currently, are your periods regular / irregular / absent # per year _____

Do you have difficulty maintaining your current body weight? Y / N

Do you have any dietary restrictions? Y/N

If Yes, please detail:

Dance/Performance History

Position as a dancer: Student / Corps dancer / Solo performer / Principal dancer / Guest Artist /

Teacher / Choreographer / Other _____

Type of dance work: Professional / Free-lance / Recreational / Student

Current company: _____ Position in company: _____

Previous Company / School: _____

If student, dance program: _____

Have you declared a dance major? Y/ N

If yes: BA / BFA

If no: Do you intend to declare a BFA major? Y/ N

If enrolled in UNLV Dance Department what is your Class Level _____

Main type of dance training Ballet / Modern / Lyrical / Contemporary / Theatrical-Broadway /

Tap / Jazz / Folk / Ethnic / Flamenco / Hip Hop / Ballroom

Age began dance training _____ Has your training been continuous Y / N

Do you do pointework? Y / N If yes, age began to dance en pointe _____

Total number of years dancing? _____ Number of years professional dancer _____

Performing currently? Y / N # hours of rehearsal per day _____

dance classes per day _____ # performances per month _____

If you are in a company, # weeks you are employed per contract year _____ , # weeks per year

on tour _____

Exercise History

Currently, do you regularly participate in a cross training/exercise program (in addition to dance)? Y / N

Do you participate in a preseason or offseason conditioning, weight, and or jump program? Y / N

If yes, what?

___ Pilates ___ Yoga ___ Feldenkrais or Alexander

___ Fitness or health club ___ Swimming ___ Walking

___ Running/jogging ___ Weight lifting ___ Jump training

___ Theraband resistance training ___ Cycling ___ Other (please list) _____

Current number hrs/wk of cardiovascular training _____

Injury History

Have you sustained any musculoskeletal injuries in the last 12 months that caused you to miss (Circle):

Performance / Rehearsal / Dance class / Work / Sports / Other / No

Were you initially seen by: General MD / Orthopaedist / Osteopath / Physical Therapist /

Chiropractor / Massage therapy / Athletic Trainer / no one

Did you consult a dance teacher for injury advice?

What was the diagnosis or body region of your musculoskeletal injury sustained in the last 12 months?

Surgery? Y / N

Where did the injury occur? Performance / Rehearsal / Dance class / Work / Sports / Other / No injury

Did you receive any rehabilitation for injuries sustained over the last 12 months? Y / N

Problems or setbacks in rehab progression? _____

Date of resumption of dance classes _____

Date of return to performance / rehearsal _____

Are there any continuing problems due to your injury? Y / N

Please circle which of the following is most accurate to describe your injury:

Figure 1: Categories of Injury with Definitions

Table 4 Categories of Injury and Their Definitions¹⁴

Category of Injury	Definition Given to Participants
Physical Complaint Injury	1. Ability to perform full dance activities, but feeling restricted by injury 2. Attended a triage session, but not a physiotherapy session
Medical Injury	An injury resulting in medical attention (physio., etc.) beyond triage
Time-Loss Injury	An injury resulting in inability to participate in activities (class, etc.)

Appendix B

EATING ATTITUDES SURVEY

Name: _____ **Date:** _____

Please answer the following questions truthfully and follow the directions carefully.

1. Age _____ 2. Sex _____ 3. Height _____ 4. Current Weight _____

5. Highest Weight (excluding pregnancy) _____ 6. Lowest Adult Weight _____

7. Level of Education Completed: Grade School High School College Past College

Figure 2: Eating Attitudes Survey

Choose one response for each of the questions. Place a check in the appropriate box.	Alway s	Usual y	Ofte n	Sometim es	Rarel y	Neve r
1. Am terrified about being overweight.						
2. Avoid eating when I am hungry.						
3. Find myself preoccupied with food.						
4. Have gone on eating binges where I feel that I may not be able to stop.						
5. Cut my food into small pieces.						
6. Aware of the calorie content of foods that I eat.						
7. Particularly avoid food with a high carbohydrate content (i.e.bread, rice, potatoes, etc)						
8. Feel that others would prefer if I ate more.						
9. Vomit after I have eaten.						
10. Feel extremely guilty after eating.						
11. Am preoccupied with a desire to be thinner.						
12. Think about burning up calories when I exercise.						
13. Other people think that I am too thin.						

14. Am preoccupied with the thought of having fat on my body.						
15. Take longer than others to eat my meals.						
16. Avoid foods with sugar in them.						
17. Eat diet foods.						
18. Feel that food controls my life.						
19. Display self-control around food.						
20. Feel that others pressure me to eat.						
21. Give too much time and thought to food.						
22. Feel uncomfortable after eating sweets.						
23. Engage in dieting behavior.						
24. Like my stomach to be empty.						
25. Have the impulse to vomit after meals.						
26. Enjoy trying new rich foods.						

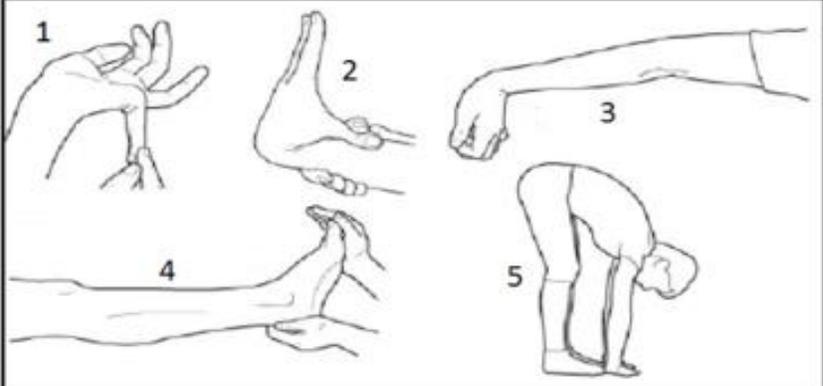
Appendix C

BEIGHTON SCALE FOR HYPERMOBILITY

Instructions:

1. Each area indicated as positive is one point.
2. When assessing the elbow for hyperextension, the forearm should be supinated. Genu recurvatum should be evaluated in standing and is defined as >10 degrees of hyperextension.
3. Beighton score of 4 out of 9 is classified as hypermobility. Dancers with scores >5 out of 9 should be referred to physical therapist/athletic trainer for joint stability exercises.

Figure 3: Beighton Hypermobility Test



CLINICAL MANEUVER	UNABLE TO PERFORM (0 POINTS)	ABLE TO PERFORM (1 POINT)
Apposition of thumb to forearm		
Right	0	1
Left	0	1
Extension of fifth finger beyond 90 degrees		
Right	0	1
Left	0	1
Extension of elbow beyond 10 degrees		
Right	0	1
Left	0	1
Extension of knee beyond 10 degrees		
Right	0	1
Left	0	1
Forward flexion of trunk, legs straight, palms touching floor	0	1
Total Beighton Score (sum of points for each maneuver)	0 to 9 points	

Appendix D

Figure 4: Brighton Criteria

BRIGHTON CRITERIA	
Major Criteria	Minor Criteria
A Brighton score of 4/9 or greater (currently or historically)	A Brighton score 1, 2, or 3/9 (0 if age > 50 years)
Arthralgia for >3 months 4 or more joints	More than 3 months arthralgia in 1 to 3 joints or back pain, spondylosis
	Dislocation or subluxation in more than one joint or in one joint on more than one occasion
	3 or more soft tissue rheumatic lesions
	Marfanoid habitus
	Abnormal skin: Striae, hyperextensibility, thin skin, papyraceous scarring
	Eye signs: Drooping eyelids, myopia, or antimongoloid slant
	Varicose veins, hernia, or uterine or rectal prolapse

Steinberg Sign for Marfanoid Habitus = Ask patient to fold his/her thumb into the closed fist.

Positive result if the thumb tip extends from the palm of the hand.

Scoring for Brighton Criteria for Joint Hypermobility Syndrome:

- Two major criteria
- One major and two minor criteria
- Four minor criteria
- Two minor criteria and unequivocally affected first-degree relative in family history

Appendix E

MUSCLE FLEXIBILITY RESTRICTION

SLR Instructions:

1. This test is performed passively. The dancer is supine lying fully on the table with hips and knees extended and pelvis in a neutral position. The examiner palpates ipsilateral ASIS. The examiner passively raises the leg keeping the knee straight with the foot relaxed. As soon as the ASIS of the ipsilateral LE begins to move posterior and/or the dancer reports pain, the test is stopped and the angle of hip flexion is measured.
2. Measure the amount with goniometry and record regardless if above or below 90 degrees.
3. A measurement less than 90 degrees at the hip is considered positive in a professional dancer.

Figure 5: Scoring for Muscle Flexibility Test

Muscle	Test	Result (circle one)	
Hamstrings	Passive SLR	Reaches 90 degrees	Yes or No
Iliopsoas	Modified Thomas Test	Hip flexion 0 degrees	Yes or No
Rectus Femoris	Modified Thomas Test	Knee flexion <90 degrees	Yes or No
IT Band	Ober's Test	Knee touches mat	Yes or No

Appendix F

DANCE BASED MOVEMENT PERFORMANCE

Observe Form:

- Second position grande plie
- Developpes a la seconde: Stance side
- Jumps in first position

Figure 6: Scoring for Dance Based Movement Performance

Sequence / Points	Problem	Assessment (circle)
2nd Position grand plié at barre 0-4 pts	Lumbo/pelvic stability lordosis-ant tilt / tucking-post tilt Hip: maintenance of turnout Knee: rolling in Ankle/foot: pronation	Prob / WNL Prob / WNL Prob / WNL Prob / WNL
Développé a la seconde from 1 st position to 90° at barre Port de bras: 2 nd position 0-5 pts (stance)	Lumbo/pelvic stability: lordosis-ant tilt / tucking-post tilt Hip: maintenance of turnout Hip: sitting in hip / pulling off hip / no movement (no shift to one leg) Knee: rolling in Ankle/foot: pronated / supinated	Prob / WNL Prob / WNL Prob / WNL Prob / WNL Prob / WNL
Jumps in 1st (no barre) Port de bras: 1 st position 0-4 pts	Lumbo/pelvic stability lordosis-ant tilt / tucking-post tilt Hip: maintenance of turnout Knees: rolling in on landing Ankle/foot: heavy / no heel strike	Prob / WNL Prob / WNL Prob / WNL Prob / WNL

Appendix G

SINGLE LEG STEP DOWN TEST

Instructions:

1. Use the same step from the cardiovascular testing (12 in or 30 cm bench) and dancer wears sneakers/athletic shoes.
2. Instruct dancer to stand on both feet in a neutral position on top of a box. The dancer is then instructed to “stand on your right leg and slowly lower the left foot toward the floor with your heel, trying to achieve your deepest demi plie, then return to standing with both feet on the step.” Instruct to keep trunk straight, hands on waist, and to not apply weight on the non-tested limb. Both legs should be tested.
3. The dancer can be given as many practice trials as needed to feel comfortable with the task. After familiarization, have the dancer perform 5 trials for examination.
4. Examine the following regions for pass/fail scoring system:
 - a. Pelvis = Fail if the dancer rotates pelvis in the transverse plane or elevates or drops hip in frontal plane.
 - b. Knee position = Fail if the dancer’s knee moves medially in the frontal plane (tibial tuberosity moves medially to an imaginary vertical line positioned over the 2nd toe).
 - c. Trunk position = Fail if the dancer leans trunk to either side, interpreted as recovery balance strategy.
 - d. Steady stance = Fail if the dancer has to support body weight on the non-tested limb or if the foot of the tested limb moves during testing.
 - e. Arm strategy = Fail if the dancer moves hands from waist, interpreted as recovery balance strategy.

Figure 7: Single Leg Step Down Test

	Left	Right
Pelvis	Pass/Fail	Pass/Fail
Knee position	Pass/Fail	Pass/Fail
Trunk position	Pass/Fail	Pass/Fail
Steady stance	Pass/Fail	Pass/Fail
Arm strategy	Pass/Fail	Pass/Fail

Left: ___pass ___fail (see guidelines for scoring criteria, 0-1 pass, 2-5 fail)

Right: ___pass ___fail

Scoring:

- If the dancer fails 2 or more for one side → Fail
- If the dancer fails 0 or 1 for one side → Pass

Appendix H

SINGLE LEG STANCE

Instructions:

1. The dancer should stand in a parallel passé, described as anatomic neutral position on one leg with the opposite foot off the ground in a hip flexed and knee flexed position, not making contact with the standing leg.
2. The dancer crosses his/her arms across the chest and gaze at the wall straight ahead.
Upon the examiner's verbal command, the dancer closes his/her eyes for 60 seconds and attempts to stand still on the single, weight bearing leg.
3. The dancer is not allowed to hop or move about on the standing foot, not allowed to touch the non-weight bearing foot to the ground, and not allowed to uncross the arms.
4. If the dancer is unable to hold the steady position for 60 seconds, he/she may have a proprioception, muscle strength, or motor control problem with respect to previous ankle sprains or other injuries. For any dancer who cannot complete at least 30 seconds, further evaluation is recommended.

Figure 8. Scoring for Single Leg Stance

Balance Unilateral stance: Parallel Passé position:

Cross arms across chest with eyes closed. (Indicate time and circle as appropriate)

Left				Right			
			(sec)				(sec)
(N)/A	(T)ouch	(B)reak	(H)op	(N)/A	(T)ouch	(B)reak	(H)op

Scoring:

- Touch = Touching the foot down to the ground.
- Break = Sudden shift at any joint, usually at the waist.
- Hop = Jumping to try to maintain balance.

Appendix I

ACCELERATED 3-MINUTE STEP TEST

Protocol:

1. Record resting heart rate in the seated position before starting the test and record as “Prep HR.”
2. At the end of the three minutes of stepping “up, up, down, down” on and off the bench to the metronome set at 112 beats per minute, record the heart rate while standing and record as “Max HR.” If taking a manual heart rate, measure beats per minute over 15 seconds.
3. Immediately after, have the dancer sit in a chair and at the end of one minute of sitting rest, record their “Recovery HR.” If taking a manual heart rate, the results will be more accurate if heart rate is recorded at 45 seconds as this will reflect a one-minute rest time.
4. The standard is to use a one-minute recovery as the score (see norms below).

Figure 9: Heart Rate Values and Norms for 3-Minute Step Test

Prep HR:	bpm	Max HR (3 min):	bpm	Recovery HR (1 min):	bpm
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NORMS FOR 3 MIN STEP TEST (Metronome: 112 beats/min) (Based on 1min recovery HR).

Fitness category	18-25	26-35	36-45	46-55	56-65
Men					
0 Excellent	<79	<81	<83	<87	<86
1 Good	79-89	81-89	83-96	87-97	86-97
2 Above average	90-99	90-99	97-103	98-105	98-103
3 Average	100-105	100-107	104-112	106-116	104-112
4 Below average	106-116	108-117	113-119	117-122	113-120
5 Poor	117-128	118-128	120-130	123-132	121-129
6 Very Poor	>128	>128	>130	>132	>129
Women					
0 Excellent	<85	<88	<90	<94	<95
1 Good	85-98	88-99	90-102	94-104	95-104
2 Above average	99-108	100-111	103-110	105-115	105-112
3 Average	109-117	112-119	111-118	116-120	113-118
4 Below average	118-126	120-126	119-128	121-126	119-128
5 Poor	127-140	127-138	129-140	127-135	129-139
6 Very Poor	>140	>138	>140	>135	>139

** For dancers who score in the 3-6 (average to very poor) categories, supplemental aerobic training is recommended.

Appendix J

SURVEY

Please fill out this feedback survey based on your experience with the UNLVPT Dancer Screening Clinic. Your responses will be taken into consideration in order for the UNLV PT students to continue to improve the quality of this student-led clinic.

Please identify which service(s) you attended with the UNLVPT Dancer Screening Clinic. Check all that apply.

- Screening
- PT Evaluation
- PT Treatment

How satisfied were you with the communication skills from the UNLVPT students?

- Extremely satisfied
- Satisfied
- Neither satisfied or dissatisfied
- Dissatisfied
- Extremely dissatisfied

How satisfied were you with scheduling sessions with the clinic?

- Extremely satisfied
- Satisfied
- Neither satisfied or dissatisfied
- Dissatisfied
- Extremely dissatisfied

The UNLV PT students demonstrated adequate knowledge on dance terminology.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

The duration of the screening/evaluation/treatment session was appropriate.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

How satisfied are you with the overall experience with the UNLVPT Dancer Screening Clinic?

- Extremely satisfied
- Satisfied
- Neither satisfied or dissatisfied
- Dissatisfied
- Extremely dissatisfied

I would recommend the UNLVPT Dancer Screening Clinic to my classmates.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree

- Strongly disagree

These next two questions are if you attended a screening:

All components of the screening were relevant to what is required of me for my dance major and future career in dance.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

After the screening, I have a better understanding on possible risk factors I may have now based on the explanations I was given by the UNLV PT students.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

If you attended a PT evaluation:

The UNLV PT students demonstrated competence in effectively addressing my concerns.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

I now have a better understanding of my injury after attending a PT evaluation.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

The home exercise program that the UNLVPT students gave me are relevant to treating my injury.

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

Is there anything else you think we could do to improve the clinic or would be helpful for you?

Please provide any additional comments, suggestions, or concerns you may have regarding your experience.

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Curriculum Vitae

John Lencioni, SPT

Department of Physical Therapy, University of Nevada, Las Vegas
4505 Maryland Parkway, Las Vegas, Nevada 89154
Email: johnpaul.lencioni@yahoo.com

Education

University of Nevada, Las Vegas
Doctorate of Physical Therapy, 2021

California State University Monterey Bay
B.S., 2018

Kristen Manaloto, SPT

Department of Physical Therapy, University of Nevada, Las Vegas
4505 Maryland Parkway, Las Vegas, Nevada 89154
Email: kristen.manaloto@gmail.com

Education

University of Nevada, Las Vegas
Doctorate of Physical Therapy, 2021
B.S. Kinesiological Sciences and University Honors, 2018

Laura Nguyen, SPT

Department of Physical Therapy, University of Nevada, Las Vegas
4505 Maryland Parkway, Las Vegas, Nevada 89154
Email: nguyent00@gmail.com

Education

University of Nevada, Las Vegas
Doctorate of Physical Therapy, 2021
B.S. Kinesiological Sciences and Minor in Biological Sciences, 2017