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Association of Generalized Joint Hypermobility and the Occurrence of Musculoskeletal Work-Related Injury in the First Zero to Five Years of Physical Therapy Practice: A Pilot Study

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ASSOCIATION OF GENERALIZED JOINT HYPERMOBILITY AND THE OCCURRENCE OF MUSCULOSKELETAL WORK-RELATED INJURY IN THE FIRST ZERO TO FIVE YEARS OF PHYSICAL THERAPY PRACTICE: A PILOT STUDY

by

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This Scholarly Project, submitted by Ashley Naas, Amanda Slaikeu, and Mikelle Fetsch in partial fulfillment of the requirements for the Degree of Doctor of Physical Therapy from the University of North Dakota, has been read by the Advisor and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.

(Graduate School Advisor)

(Chairperson, Physical Therapy)

PERMISSION

Title	Association of Generalized Joint Hypermobility and the Occurrence of Musculoskeletal Injury in the First Zero to Five Years of Physical Therapy Practice
Department	Physical Therapy
Degree	Doctor of Physical Therapy

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Signature Mikelle Fethh

Date Oct 19, 2017

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ABSTRACT

Background: Previous research has shown that there is greater prevalence of work-related injuries for Physical Therapists in their early years of practice. However, little evidence has focused on the correlation with the high physical strain and stress of the job to the rate of injury occurrence. Hypermobility has also been researched in regards to an increased risk of sustaining an injury, but no correlation has been found between hypermobility and work-related injury in Physical Therapists.

Purpose: The purpose of this study was to determine if there is a correlation between hypermobility and work-related injury occurrence in the first five years of physical therapy practice.

Methods: A 141 question survey was sent to 235 Physical Therapists who graduated from the University of North Dakota Physical Therapy Program between 2012-2017 and had begun their first 5 years of professional practice. The survey consisted of questions regarding demographic information, injury history, and associated information following the start of their first 5 years of physical therapy.

Results: A total of 79 individuals responded to the survey. Twenty-two respondents reported being hypermobile according to the self-reported Beighton Hypermobility Scale. Of the 22 hypermobile respondents, 6 reported injuries that occurred during their first 0-5 years of practice. Only 1 of the 6 injuries in hypermobile respondents was reported as work-related. The injury reported occurred in the wrist. Four of the 5 work-related injuries reported, were involved with performance of manual therapy.

Conclusion: Due to the size of the sample, significant results were not found to support a correlation between hypermobility and work-related injuries. There was no correlation found between hypermobility of the low back/SI and low back injuries along with finger and wrist hypermobility and finger and wrist injuries.

Keywords: Physical Therapy; Hypermobility; Work-related; Injuries; Prevalence; Beighton

CHAPTER I

INTRODUCTION

Scope of Study

This study was an extension of previous studies performed at the University of North Dakota (UND) with data collected over the years on hypermobility and injuries in Physical Therapist (PT) and Occupational Therapist (OT) students.[17,18,19] The previous results of the correlation of hypermobility and injuries led to further questioning about the effect of hypermobility and PT injury rates in the first 5 years of practice. Articles about work-related PT injuries were found on PubMed, ClinicalKey, and Journal Databases, although no articles about the correlation of hypermobility and work-related injuries were found. Therefore, this study focused on work related injuries of PTs due to increased physical strain they encounter when working with patients.

Problem Statement

This study focused on PTs and examined the correlation between sustained injuries and level of self-reported hypermobility. Little to no research has been completed on the topic of hypermobility relating to PT's injuries. Therefore, it is important to collect information regarding the topic for research purposes, clinical use, and education.

Purpose of Study

The purpose of this study was to determine whether hypermobility correlates with work-related injuries sustained in a PT's first 5 years of practice upon graduation from UND's PT Doctorate Program. A survey was sent to the alumni requesting them to answer questions regarding their hypermobility, previous injuries, and work-related injuries. The Beighton

Hypermobility Scale was used in this study for subject self-assessment of their individual hypermobility score. By determining if there was a greater risk of developing injuries for PTs with hypermobile joints, clinical education addressed to PTs prior to starting their professional practice could include protective measures and behaviors.

Significance of Study

Previous research showed PTs and other health professionals were injured in their work settings due to the demands and stresses associated with their occupations. Many studies completed by Bork et al.[1], Silverstein[2], and West[3] on injuries related to the physical strain placed on PTs in their early years of practice, but do not correlate the prevalence of hypermobility in PTs with an increased risk of injury. The goal of this study was to correlate hypermobility with work-related injuries that PTs sustain in their first five years of practice.

Research Questions

1. Is a self-reported Beighton hypermobility score of 4 or more associated with a greater frequency of work related injuries than those with a score of less than 4?
2. Does hypermobility of the lumbar spine correlate to a greater frequency of low back/Sacroiliac (SI) joint injuries during physical therapy practice?
3. Does hypermobility of the wrist/thumbs/fingers correlate to a greater frequency of wrist/hand injuries during physical therapy practice?
4. Is the use of manual therapy in physical therapy practice associated with greater risk of work-related injury?

Hypotheses and Alternative Hypotheses

Null Hypothesis: There is no significant difference in hypermobility and injury rate in the first five years of practice for PTs.

Alternative Hypothesis: There is significant difference in hypermobility and injury rate in the first five years of practice for PTs.

Null Hypothesis: There is no significant difference in the hypermobility in the low back/SI and frequency of low back/SI injured during physical therapy practice.

Alternative Hypothesis: There is significant difference in the hypermobility in the low back/SI and frequency of low back/SI injured during physical therapy practice

Null Hypothesis: There is no significant difference between hypermobility in the wrist/thumbs/fingers and frequency of injury to the wrist/thumbs/fingers.

Alternative Hypothesis: There is significant difference between hypermobility in the wrist/thumbs/fingers and frequency of injury to the wrist/thumbs/fingers.

Null Hypothesis: There is no significant difference between practicing manual therapy and greater risk or work-related injury.

Alternative Hypothesis: There is significant difference between practicing manual therapy and greater risk or work-related injury.

CHAPTER II

LITERATURE REVIEW

Due to the heavy physical demands of physical therapy practice, PTs are at a heightened risk of developing work-related musculoskeletal injuries. Physical Therapists frequently perform soft tissue mobilization, transfers of dependent patients, interventions requiring manual resistance, lifting of heavy equipment, and utilization of repetitive postures throughout the day, which increases the risk of sustaining work-related injury.[1,2,3] Research shows that the prevalence of work-related injuries among PTs is high, with a lifetime prevalence of 55-91%. [3,4,5,6,7,8] There was a significant occurrence of low back pain in a PT's first four to five years of practice.[4,5,9,10,11] According to Holder[9], the highest prevalence of injuries was seen in PTs who were between the ages of 21-30 years old who practiced approximately 41-50 hours per week. In addition to a high prevalence of low back pain, PTs reported that they felt more symptoms in their neck, upper back, wrist, and hands than other areas of the body.[1,4] Younger PTs were also more reluctant to ask for help with tasks that have increased demands on the body and more than 50% felt their first symptoms as a student or within their first 5 years of practice.[4,10,11] King et al.[12] stated, "The most common sites of symptoms were the low back, neck, and shoulder for the younger workers, and the low back, hand, neck, and knee for older workers."

Additional research has related work-related injuries to the type of work setting, the type of rehabilitation techniques used, and the gender of the PT. Acute Care/hospital settings have a high prevalence of initial injuries occurring in PT practice due to the high stressors associated

with dependent transfers of patients with extensive impairments.[1,4,5,11] Techniques utilized during practice that led to an increased prevalence of injury included manual therapy and neurological rehabilitation techniques.[4] Manual therapy was found to be primarily associated with symptoms felt in the upper extremities and neurological techniques were associated with symptoms felt in the trunk and lower extremities.[4] Darragh[13] reported that 71.1% of injuries that occur in outpatient settings are due to manual therapy techniques. Multiple research studies have also reported that females are at a greater risk of sustaining work-related PT injuries or reporting pain than males.[4,5]

Because of the increased prevalence of injuries in PTs, PTs have had to change practice settings, leave the profession, reduce their hours of patient care, and alter the techniques they used in their practice.[1,4,11] According to Cromie[4], 1 in 6 PTs changed practice setting or left the PT profession because of work-related PT injuries. As PTs moved further along in their years of practice, they continued to gain experience and moved into supervisory and administrative roles which in turn reduced the physical strains and stresses of treating patients daily.[1]

Hypermobility in joints has been defined as joints that move freely beyond the expected range.[14] Researchers question whether or not hypermobility correlates with injury occurrence in PT practice due to the concept and idea behind Joint Hypermobility Syndrome (JHS) and its implications linking musculoskeletal complaints and generalized joint laxity.[15] Symptoms of hypermobility are pain and stiffness, clicking, joint dislocation, fatigue, recurrent injuries, and sprains.[16] There is a possibility of work-related PT injuries due to the stress placed on the joints with manual therapy and other techniques used to assist patients.

Previous studies at the UND, analyzed the hypermobility in PT and OT students. Their studies showed an increased rate in hypermobility of PT and OT students compared to the general population. Hypermobility was found to be greater in females than males. Dislocation injuries

were more likely found to occur in hypermobile joints. None of the UND studies related hypermobility to an increase of work-related PT injuries and musculoskeletal symptoms. Their research was limited to students who were currently in professional programs and did not follow post-graduation.[17,18,19] No outside sources were found regarding a relationship between work-related injuries in PTs and their respective hypermobility status.

Measures

Utilizing the Beighton Scale as an objective measure of hypermobility is considered the standard report for joint hypermobility in 9 joints of the body.[20] The 1969 system was amended by Beighton et al,[21] and was revised to include 1 point for each positive test. This method has found favor because scoring hyperextension of the middle finger from prior methods excluded too many participants, differences in ankle movements are unlikely to show much variation amongst people in the general population, and tests that include the trunk and hip are more likely to represent generalized articular laxity. The standardized and reproducible Beighton protocol consists of 5 clinical maneuvers performed bilaterally and scored with a 0 for negative and 1 for positive.[22] A total possible score of 9 can be derived by the summation of the maneuvers. The maneuvers include: 1) passive opposition of the thumb to the flexor side of the forearm, 2) passive extension of the 5th digit >90 degrees, 3) passive hyperextension of the elbow >10 degrees, 4) passive hyperextension of the knee >10 degrees, 5) forward flexion of the trunk with palms of the hands on the floor.[23] With the use of this scale, generalized joint hypermobility can be defined with a score of 4 or greater.[24] Intrarater and interrater reliability of the Beighton and Horan Joint Mobility Index has been found to be good-excellent for females from 15 to 45 years of age.[25] Naal et al.[26], found the agreement between the self-assessed Beighton score and examiner assessed Beighton score to be good-to-excellent with kappa values of 0.5 to 0.8.[26] In a

systematic review, the Beighton Scale was deemed acceptable for use in clinical practice due to its interrater reliability provided that testing be uniform with collection of additional historical information. Shortcomings in reliability and validity of 3 other assessments (Carter and Wilkinson, Hospital del Mar, and Rotes-Querol), were found which supported the decision to use the Beighton Scale in this research study.[27] Therefore, self-report of the Beighton hypermobility scale was used in this study due to its ease of use, reproducibility, reliability, and high prevalence in research.

CHAPTER III

METHODS

Subjects

A sample of 235 subjects were selected from the UND Alumni database for whom email addresses were available. All subjects were graduates from the UND PT program and had been practicing for 0-5 years. See *Table 1* for details regarding sample demographics.

Instrumentation

All subjects were sent an email with a link to a survey that could be completed voluntarily. The survey, which was created through Qualtrics, consisted of 80-141 questions with a maximum completion time of 20 minutes dependent upon the responses. The questions assessed clinician demographics, practice patterns, self-reported hypermobility scores, and injury history prior to and after beginning their practice. Self-reported hypermobility scores were assessed via the Beighton Hypermobility Scale. Instructions on how to perform and score each test was provided along with pictures demonstrating proper technique. To ensure consistency in the types of reported injuries, participants were asked to include only those injuries that required medical care. A sample of the complete survey is located in Appendix B.

Procedure

The initial survey was pilot tested by 7 PT students and 2 UND PT faculty members for question clarity, grammatical content, and information relevance. The survey was revised and then approved by the UND Institutional Review Board (IRB-201704-307). A copy of approval is in Appendix A. An email outlining the informed consent procedure, purpose of research, contact information, and a link to the survey was sent to 235 UND PT graduates. The email requested

that participants fully complete the survey. A reminder email was sent to all subjects following 1 week of the initial email, and a subsequent reminder was sent following 2 weeks of the initial email. All received data was extracted via Qualtrics and analyzed by the researchers.

Table 1: Sample Demographics

Characteristics	**Mean**	**Range**	**Standard Deviation**
Age (Years)	28.7	25-50	+/- 8.13
Activity Level (days/week)	4.5	0-7	+/- 2.78
Number of Years in Practice	3	2-6	+/- 1.73
Hypermobility Score (Beighton Hypermobility Scale Measure)	2.1	0-9	+/- 3.74
	Number (N)	**Percentage (%)**	
Gender			
Female	59	74.68	
Male	20	25.32	
Pregnant or Nursing (Females)			
Yes	10	16.95	
No	49	83.05	
Ethnicity			
White	78	98.73	
Other	1	1.27	

Data Analysis

The email was sent to 235 individuals. Seven emails bounced back and 3 emails failed to send, resulting in 225 successfully delivered emails. Of the 225 surveys that were delivered, 79

were completed for a response rate of 35%. Data was extracted from the survey results and analyzed by the researchers. Basic frequencies were extracted and analyzed along with specific hypermobility scores and injury rates, specifically work-related injuries. Back hypermobility was compared to the occurrence of back injuries, and hypermobility of the wrist, hand, and fingers was compared to the occurrence of upper extremity injuries. The association between manual therapy and work-related injury was also analyzed from the recorded responses. Significance was set at α=.05 level.

CHAPTER IV

RESULTS

The survey was sent to 235 UND PT alumni and 225 emails were delivered successfully. Of the 225, 79 (59 female) alumni responded to the survey for a response rate of 35%. Of the 79 respondents, 22 (27.8%) were considered hypermobile (4 or more positive tests) based on the Beighton Hypermobility Scale (BHS). Seventeen females and 5 males reported hypermobility. A total of 47 respondents were hypermobile in at least 1 of the 9 categories. See *Table 2* below for detailed information regarding subject practice demographics.

Table 2: Practice Demographics.

Area of Practice		
Outpatient Orthopedics	49	36.57
Outpatient Neuro	9	6.72
Inpatient Neuro	7	5.22
Pediatrics	10	7.46
Acute Care	19	14.18
Skilled Nursing Facility	15	11.19
Sports Medicine	5	3.73
Home Health	9	6.72
School District	2	1.49
Community Outreach	2	1.49
Other (Geriatrics, Women's Health, Rural)	7	5.22

Direct Patient Care Hours (hours/week)		
0-10	1	1.27
10-20	0	0.00
20-30	7	8.86
30-40	52	65.82
40-50	19	24.05
Graduation Year		
2012	10	12.66
2013	19	24.05
2014	19	24.05
2015	14	17.72
2016	17	21.52
Practice State		
Alaska	3	3.79
Arizona	6	7.59
Colorado	2	2.53
Florida	1	1.27
Idaho	2	2.53
Minnesota	27	34.18
Montana	3	3.79
Nebraska	1	1.27
North Dakota	25	31.65
Ohio	2	2.53
South Dakota	3	3.79
Utah	1	1.27

Washington	1	1.27
Wisconsin	1	1.27
Wyoming	1	1.27
Interventional Techniques Used in Practice		
Manual Therapy	55	14.71
Therapeutic Exercise	78	20.86
Mobility Training	44	11.76
PNF	19	5.08
Neuromuscular Reeducation	60	16.04
Therapeutic Activity	61	16.31
Pool Therapy	6	1.60
Gait Training	48	12.83
Other (Dry Needling, ASTYM, Therapeutic Neuroscience Education)	3	0.80

Comparison of Hypermobility vs. Non-hypermobility and work-related injuries. Of the 22 hypermobile respondents, 6 (27.2%) sustained injuries during their professional practice, but only 1 (4.5%) was a work-related injury. The work-related injury was a wrist injury. The 5 other injuries reported by participants were at the neck, hip, knee, and ankle. There were 20 injuries reported by individuals who were not hypermobile. Four of the 20 injuries were work-related.

Comparison of work-related injuries and hypermobility in the lumbar spine and SI joint. Twenty-four (30.4%) respondents reported a positive lumbar spine test from the BHS. Although hypermobile at the lumbar spine, all of the respondents were not considered to have generalized hypermobility. None of the 24 respondents who were hypermobile at the lumbar spine reported experiencing a low back or sacroiliac (SI) joint injury. Overall, there were 5 low back/SI injuries

reported. All 5 respondents were not hypermobile in the lumbar spine. One of the 5 (20%) injuries was work-related, this respondent reported only a 2/9 on the BHS. The other 4 did not report any hypermobility on the BHS.

Comparison of work-related injuries and hypermobility in the wrist and hand. Five respondents reported work-related injuries of the wrist or hand. One respondent reported 7/9, 3 reported 0/9, and 1 reported 3/9 on the BHS. Five respondents reported a total of 6 injuries (one participant had 2 injuries). Of all 6 injuries reported to the hand and wrist, 4 of them were work-related. The 4 work-related injuries consisted of 2 wrist injuries and 2 finger injuries. One respondent stated their injury resulted from overuse with manual therapy work. Another respondent, who was hypermobile according to the BHS, reported a Triangular Fibrocartilage Complex tear. The other 2 injuries were strain at the wrist and fingers. See *Table 3* below for a summary of wrist and finger injuries.

Table 3: Work-related wrist and finger injury summary

Subject	**Beighton Score (0-9)**	**Wrist Injury**	**Hand/Fingers Injury**	**Work-related?**
1	0	Yes	Yes	Wrist-No Finger-Yes
2	0	Yes	No	Yes
3	7	Yes	No	Yes
4	3	No	Yes	Yes
5	0	No	Yes	No

Comparison of manual therapy use and work-related injury. Fifty-five (69.6%) respondents reported frequent use of manual therapy techniques. Sixteen of the 55 (29.1%) reported injuries, but only 4 injuries were work-related. These 4 work-related injuries were reported by respondents to be a result of manual therapy practice. The 4 reported injuries were at

the low back/SI (1), wrist (1), and fingers (2). One injury was reported by the participant as being related to "overuse of manual therapy" techniques. Of all the work-related injuries for manual therapy practice, the wrist and low back/SI joint injuries were in the first year of practice and the finger injuries were in the third year of practice. See *Table 4* for summary regarding manual therapy use versus work-related injury.

Table 4: Manual therapy use versus work-related injury summary

Subject	**Location of Work-Related Injury**	**Practice Manual Therapy**	**Type of Injury**
1	Fingers	Yes	Strain
2	Wrist	Yes	Strain
3	Fingers	Yes	"Overuse from Manual work"
4	Back/SI Joint	Yes	Strain

CHAPTER V

DISCUSSION AND CONCLUSION

Discussion

The survey reported hypermobility in 22/79 (27.8%) respondents according to their self-assessed BHS. Only 6/22 (27.3%) hypermobile respondents reported an injury, and only 1/6 was a work-related injury. There were 57 non-hypermobile respondents. Injuries were reported in 20/57 non-hypermobile respondents. Of these 20 subjects, 4 reported work-related injuries. The literature stated that "most of the injuries occurred in the back, neck, and shoulder for younger workers, and low back, hand, neck, and knee for older workers".[12] The results from this study reported 5 work-related injuries, but only 1 of which was a back injury. This conflicts with much of the research in regard to work-related injuries occurring in the low back.

Only 1 hypermobile respondent reported a work-related injury. Therefore, this 1 injury is not sufficient to provide conclusive data correlating hypermobility and work-related injuries. Thus, the null hypothesis cannot be rejected. Without the known mechanism of injury, there is an inability to correlate hypermobility to work-related injuries in the first 5 years of PT practice.

Low back/SI joint injuries were reported by respondents who were not hypermobile in the area. According to this study then, there was no correlation of low back/SI pain with hypermobility. Low back pain is one of the main symptoms PT's experience in the clinic.[12] Although low back injuries occur, this study is unable to correlate their occurrence with the presence of hypermobility.

The survey results reported 1 respondent testing positive for hypermobility and reported a work-related injury of the wrist/hand. The other wrist/hand injuries were not work-related which leads to the inability to correlate hypermobility with wrist/hand injuries. The literature review listed the wrist/hand as one of the main areas for injury in PT's. This study did not support the research by King due to the limited amount of work-related injuries reported in this population.[12]

Of the 79 participants, 55 (69.6%) respondents reported frequently using manual therapy techniques. Of the 55, only 4 respondents reported work-related injuries. The injuries were at the wrist, fingers, and low back/SI joint. Therefore, 80% of the work-related injuries were sustained in individuals who frequently practice manual therapy, which is higher than a study by Darragh. Darragh's study reported that 71.1% of work-related injuries that occurred in an outpatient setting were related to manual therapy.[13] The study results accurately represented Darragh's study, but the sample size is too small to prove significance. Because this study did not ask how the respondents sustained their injuries, we were unable to correlate all injuries to manual therapy incidents. However, one participant explicitly stated their hand injury was a result of the overuse of manual therapy techniques.

Limitations of this Study

Several factors contribute to the limitations of this pilot study. Although the initial sample size of 225 was sufficient, only 79 responses were collected resulting in a small sample size which was a significant limitation. The limited response rate could be a result of restrictions in access to correct or current contact information for the UND PT graduates between 2012-2017. Many of the responses from the survey of this pilot study were found to be inconclusive due to complications with survey style. Therefore, survey revisions are advised for future studies. There was an inability to pool data from previous studies completed by UND PT on hypermobility and injury rates which restricted our conclusions to only this single sample of survey respondents.

The sample size also consisted of responses primarily from Midwestern states (*Table 2*), which could not be generalized to a national level.

Limitations were also found in the programming used to make the survey. This programming, Qualtrics, provided some limitations with correct data collection based on how each question was ordered and if each question was required to be answered by the respondent. Because of this limitation, some initial research questions were unable to be answered based upon the data gathered from the survey responses. Comprehension of survey questions also is a limitation of this study. Because the survey was emailed to our sample, there was no way to guarantee similar comprehension of questions among respondents.

Finally, a self-reported hypermobility score via the BHS was used in this study. Although all respondents were licensed PTs, there could still be inconsistencies with the scale measures which could contribute to inaccurate scores amongst respondents. Respondents may have interpreted questions differently than their intended purpose, which may in turn limit the validity of the conclusions.

Recommendations for future studies include obtaining a larger sample size, by potentially expanding the study beyond UND PT graduates to a state or national level. Increasing the duration the survey is open and reducing the length of the survey could potentially improve the response rate. Future studies may also focus survey questions on specific settings or types of interventions used in PT to answer a more condensed research question and provide more detailed information regarding work-related injuries in PTs who are hypermobile.

Conclusion

This research study investigated hypermobility and work-related injuries in the first five years of PT practice. There were no significant findings correlating hypermobility and injury rate

in the first 5 years of practice for PTs. This may be due to study limitations such as a small sample size and few work-related injuries. In conclusion, the correlation between hypermobility and work-related injuries was found to be inconclusive for recent PT graduates. There was significant evidence found between practicing manual therapy and a greater risk of work-related injuries of the wrist/hand. Due to the findings of this study, it is important for recent PT graduates to take precautions to prevent work-related injuries when using physically demanding skills. Further research needs to be completed with a larger sample size to draw accurate conclusions regarding the correlation between hypermobility and work-related injuries in PTs in their first five years of practice.

APPENDIX A

University of North Dakota Exempt Certification Form – JANUARY 2015 VERSION
Research Involving the Use of Survey, Interview, Observational Procedures or Educational Tests

Complete this form if you are requesting permission to use survey, interview, or observational procedures, or educational tests.

All research with human participants conducted by faculty, staff, and students associated with the University of North Dakota must be reviewed and approved as prescribed by the University's policies and procedures governing the use of human subjects. No activities are to be initiated without prior review and approval by the Institutional Review Board.

Please answer the following questions regarding your research. Handwritten forms are not accepted – responses must be typed.

1. Are prisoners included in the research? ☐ **Yes** ☒ **No**
If you answered "Yes" to the above question, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form". If you answered "No", continue to question 2a.

2a. Are children included in the research? ☐ **Yes** ☒ **No**
If you answered "No" to the above question, please skip question 2b and continue to question 3. If you answered "Yes", continue to question 2b.

2b. Does the research include survey or interview procedures? Does the research involve the observation of public behavior with researcher interaction with the subjects? ☐ **Yes** ☒ **No**
If you answered "Yes" to questions 2a and 2b, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form". If you answered "No", continue to question 3.

3a. Will the data be documented in such a manner that subjects cannot be identified, either directly or through identifiers linked to the subjects (subject name, social security number, birth date, coding, etc.) ? ☐ **Yes** ☒ **No**
If you answered "Yes" to the above question, please skip question 3b and continue with the rest of the form. If you answered "No", continue to question 3b.

3b. Will the disclosure of the subjects' responses outside of the research reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation?
☐ **Yes** ☒ **No**
If you answered "Yes" to the above question, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form".

4. Will the research involve the use of audio, video, digital or image recordings of subjects? ☐ **Yes** ☒ **No**
If you answered "Yes" to the above question, this research does not qualify as exempt. Please fill out and submit a "Human Subjects Review Form". If you answered "No", provide the information requested below:

Principal Investigator: Susan H N Jeno, PT, PhD

Telephone: 777-3662 E-mail Address: sue.jeno@med.und.edu

Complete Mailing Address: 1301 North Columbia Road Stop 9037 Grand Forks, ND 58202-9037

School/College: University of North Dakota Department: Physical Therapy

Student Advisor (if applicable): _____

Telephone: _____ E-mail Address: _____

Address or Box #: _____

School/College: _____ Department: _____

****** All IRB applications must include a Key Personnel Listing***

Project Title: Comparison of self reported Hypermobility status and early career work injuries among Physical Theranists

Proposed Research Beginning Date: April 2017 ***Exempt research will be approved for 3 years from the original approval date.***

Funding agencies supporting this research: None

(A copy of the funding proposal for each agency identified above MUST be attached to this proposal when submitted.)

☐ YES or ☒ NO Does any researcher associated with this project have a financial interest in the results of this project? If yes, submit on a separate piece of paper an additional explanation of the financial interest. The Principal Investigator and any researcher associated with this project should have a Financial Interests Disclosure Document on file with their department.

☐ YES or ☒ NO Will any research participants be obtained from another organization outside the University of North Dakota (e.g., hospitals, schools, public agencies, American Indian tribes/reservations)?

☐ YES or ☒ NO Will any data be collected at or obtained from another organization outside the University of North Dakota?

If yes to either of the previous two questions, list all institutions: _____

Letters from each organization must accompany this proposal. Each letter must illustrate that the organization understands its involvement and agrees to participate in the study. Letters must include the name and title of the individual signing the letter and should be printed on organizational letterhead.

Does any external site where the research will be conducted have its own IRB? ____ YES or X NO

If yes, does the external site plan to rely on UND's IRB for approval of this study? ____ YES or ____ NO
(If yes, contact the UND IRB at 701 777-4279 for additional requirements)

If your project has been or will be submitted to other IRBs, list those Boards below, along with the status of each proposal.

_____ Date submitted: _____ Status: ___ Approved ___ Pending

_____ Date submitted: _____ Status: ___ Approved ___ Pending

(include the name and address of the IRB, a contact person at the IRB, and a phone number for that person)

Type of Project: Check "Yes" or "No" for each of the following.

☒ YES or ☐ NO New Project

☐ YES or ☒ NO Continuation/Renewal

☐ YES or ☒ NO Is this a Protocol Change for previously approved project? If yes, submit a signed Protocol Change Form, along with a signed copy of this form with the changes bolded or highlighted.

☐ YES or ☒ NO Dissertation/Thesis/Independent Study

☐ YES or ☒ NO Student Research Project

Please provide additional information regarding your research by responding to questions 5-11 on a separate sheet of paper.

5. **In non-technical language, describe the purpose of the study and state the rationale for this research.**

6. **In non-technical language, describe the study procedures.**
   How will subjects be informed of the research? If you will be having subjects sign a consent form, justify why. How will instrument(s) be distributed/collected? Will compensation be provided? What is the suspected duration of subject participation? Etc.

7. **Where will the research be conducted?**

8. **Describe what data will be recorded.**

9. **How will data be recorded and stored (that is will it be coded, anonymous, etc.)?**
   Note: Must state that data will be stored for a minimum of three years after data analysis is complete, or for a period of time sufficient to meet federal, state, and local regulations, sponsor requirements, and organizational policies and procedures.

10. Describe procedures you will implement to protect confidentiality of data collected from participants and privacy of participants when participating in research activities.

11. Describe the nature of the subject population and the estimated number of subjects.

If participants who are likely to be vulnerable to coercion and undue influence are to be included in the research, define provisions to protect the privacy and interests of these participants and additional safeguards implemented to protect the rights and welfare of these participants.

12. Include a copy of the study information sheet to be given to participants (either in person or online, depending on the nature of the research) that discloses research information. A template is available under 'Exempt Certification Forms' on the IRB Forms page of the IRB website: http://und.edu/research/resources/human-subjects/forms.cfm

Necessary attachments:

- ☐ Signed Student Consent to Release of Educational Record Form (students and medical residents only);
- ☐ Investigator Letter of Assurance of Compliance;
- ☐ Key Personnel Listing;
- ☐ Surveys, interview questions, or educational tests;
- ☐ Printed web screens (if survey is over the Internet);
- ☐ Advertisements, including recruitment emails/letters and social network postings; and
- ☐ Informed consent statement.

NOTE: The UND IRB requires that all key personnel involved in the research complete human subject education before IRB approval to conduct research can be granted.

****

By signing this form, I certify that the above information is accurate and that this research will be conducted in accordance with the statements provided above; this research does not involve prisoners, but if a subject becomes a prisoner, I will notify the IRB.

(Principal Investigator)	Date:
(Student Adviser)	Date:

*****All students and medical residents must list a faculty member as a student advisor on the first page of the application and must have that person sign the application.*****

Submit the signed application form and any necessary attachments to the Institutional Review Board, 264 Centennial Drive Stop 7134, Grand Forks, ND 58202-7134; or bring it to Twamley Hall, Room 106.

INVESTIGATOR LETTER OF ASSURANCE OF COMPLIANCE WITH ALL APPLICABLE FEDERAL REGULATIONS FOR THE PROTECTION OF THE RIGHTS OF HUMAN SUBJECTS

I Susan H N Jeno
(Name of Investigator)

agree that, in conducting research under the approval of the University of North Dakota Institutional Review Board, I will fully comply and assume responsibility for the enforcement of compliance with all applicable federal regulations and University policies for the protection of the rights of human subjects engaged in research. Specific regulations include the Federal Common Rule for Protection of the Rights of Human Subjects 45 CFR 46. I will also assure compliance to the ethical principles set forth in the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research document, The Belmont Report.

I understand the University's policies concerning research involving human subjects and agree to the following:

1. Should I wish to make changes in the approved protocol for this project, I will submit them for review PRIOR to initiating the changes. (A proposal may be changed without prior IRB approval where necessary to eliminate apparent immediate hazards to the subjects or others. However, the IRB must be notified in writing within 72 hours of any change, and IRB review is required at the next regularly scheduled meeting of the full IRB.)

2. If any problems involving human subjects occur, I will immediately notify the Chair of the IRB, or the IRB Coordinator.

3. I will cooperate with the UND IRB by submitting Research Project Review and Progress Reports in a timely manner.

I understand the failure to do so may result in the suspension or termination of proposed research and possible reporting to federal agencies.

Investigator Signature

3/30/17
Date

STUDENT RESEARCHERS: As of June 4, 1997 (based on the recommendation of UND Legal Counsel) the University of North Dakota IRB is unable to approve your project unless the following "Student Consent to Release of Educational Record" is signed and included with your IRB application.

STUDENT CONSENT TO RELEASE OF EDUCATIONAL RECORD[1]

Pursuant to the Family Educational Rights and Privacy Act of 1974, I hereby consent to the Institutional Review Board's access to those portions of my educational record which involve research that I wish to conduct under the Board's auspices. I understand that the Board may need to review my study data based on a question from a participant or under a random audit. The title of the study to which this release pertains is _____

_____

_____.

I understand that such information concerning my educational record will not be released except on the condition that the Institutional Review Board will not permit any other party to have access to such information without my written consent. I also understand that this policy will be explained to those persons requesting any educational information and that this release will be kept with the study documentation.

_____ _____

ID # Printed Name

_____ _____

Date Signature of Student Researcher

[1]Consent required by 20 U.S.C. 1232g.

Comparison of Self-Reported Hypermobility Status and Early Career Work Injuries Among Physical Therapists

5. In non-technical language, describe the purpose of the study and state the rationale for this research.

Research indicates that work related injuries are most likely to occur in the first 5 years of entering professional practice. Research to date has not determined if hypermobility could be a contributing factor in these injuries. The purpose of this research study, then, is to determine if there is a correlation in self-reported hypermobility scores and work-related injuries in physical therapists within their first five years of professional practice.

6. In non-technical language, describe the study procedures.

A survey with up to 141 questions (depending on response) will be sent to University of North Dakota Physical Therapy graduates who graduated within the past 6 years. Subjects will need to complete a consent form prior to starting the survey acknowledging that their name will be associated with their survey responses but will be kept confidential. The Qualtrics survey will be distributed via email's obtained from the University of North Dakota Alumni database. The estimated duration of the survey is 20 minutes.

7. Where will the research be conducted?

Subjects will complete the survey on their personal time at the location of choice.

8. Describe what data will be recorded.

All responses from the survey including demographics, previous injury history, and injury history after beginning professional practice will be recorded by means of a Qualtrics on-line survey.

9. How will data be recorded and stored (that is will it be coded, anonymous, etc.)?

The survey is being sent to alumni of the UND Physical Therapy program and data will be linked to the email address as it is compiled in the Qualtrics system. Data will be analyzed in aggregate versus individually through Qualtrics and will be confidently stored in the Qualtrics-Secure database.

10. Describe the procedures you will implement to protect confidentiality of data collected from participants and privacy of participants when participating in research activities.

All data obtained from participants will be kept confidential and will only be reported in an aggregate format (by reporting only combined results and never reporting individual ones). All questionnaires will be concealed, and no one other than the investigators will have access to them. The data collected will be stored in the HIPPA-compliant, Qualtrics-secure database. Unless the data is required for future studies, the information will be destroyed (deleted) by the primary investigator three years after the study has been completed.

11. Describe the nature of the subject population and the estimated number of subjects.

Subjects will be University of North Dakota Physical Therapy graduates who have graduated within the past 6 years. The estimated number of subjects is 300.

APPENDIX B

Hypermobility Injury Survey 2017

Q2 I have read, understood, and printed a copy of, the above consent form and desire of my own free will to participate in this study. </P>

- ○ Yes
- ○ No

Q4 What is your gender?

- ○ Male
- ○ Female
- ○ I prefer not to disclose

Q24 Are you currently pregnant or nursing?

- ○ Yes
- ○ No

Q5 What is your year of birth?

_____

Q6 What is your ethnicity?

- ○ White
- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ Asian
- ○ Native Hawaiian or Pacific Islander
- ○ Other
- ○ I prefer not to diclose.

Q206 On average, how many days per week do you participate in vigorous physical activity (30 min or longer at heart rate above 60% max)?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7

Q9 What is your current area of practice? (select all that apply)

- ☐ Outpatient Orthopedics
- ☐ Outpatient Neuro
- ☐ Pediatrics
- ☐ Inpatient Neuro
- ☐ Acute Care
- ☐ Sports Medicine
- ☐ Skilled Nursing Facility
- ☐ Health and Wellness Facility
- ☐ Patient's Home/Home Care
- ☐ School System
- ☐ Community Outreach

☐ Mental Health

☐ Other (please specify) _____

Q131 In which state are you currently practicing?

Q10 In which year did you graduate from the UND Physical Therapy program?

○ 2012

○ 2013

○ 2014

○ 2015

○ 2016

○ 2017

Q11 How many years have you been engaged in patient care since graduation?

▼ 0 ... 5

Q12 How many direct Patient Care Hours (billable hours) do you work per week?

▼ 0-10 ... 40-50

Q14 Of the following techniques, which do you use regularly (at least daily) in your patient treatments? (select all that apply)

- ☐ Manual Therapy
- ☐ Therapeutic Exercise
- ☐ Mobility Training
- ☐ PNF
- ☐ Gait Training
- ☐ Neuromuscular Re-education
- ☐ Therapeutic Activities
- ☐ Pool Therapy
- ☐ Other, please list _____

Q16 The Beighton Scale of Hypermobility includes all of the following tests. We would like you to self assess if you are able to perform each of the tests. Please indicate if you test positive (can achieve the test position) for any of the 9 tests at this time. (select all that apply)

- ☐ Are you able to bend forward and place the palms of your hands on the floor without bending your knees? Yes indicates a positive test.
- ☐ Apposition of right thumb forearm - Can you bring your right thumb to the flexor surface of the forearm, touching the thumb to the forearm? Yes indicates a positive test.
- ☐ Apposition of left thumb able to forearm - Can you bring your left thumb to the flexor surface of the forearm, touching the thumb to the forearm? Yes indicates a positive test.
- ☐ Right 5th digit extension >90 degrees - Can you hyperextend the 5th MCP joint to at least 90 degrees? Yes indicates a positive test.
- ☐ Left 5th digit extension >90 degrees - Can you hyperextend the 5th MCP joint to at least 90 degrees? Yes indicates a positive test.
- ☐ Right elbow extension >10 degrees - Does your elbow hyperextend at least 10 degrees? Yes indicates a positive test.

☐ Left elbow extension >10 degrees - Does your elbow hyperextend at least 10 degrees? Yes indicates a positive test.

☐ Right knee extension >10 degrees - Does your knee hyperextend at least 10 degrees? Yes indicates a positive test.

☐ Left knee extension >10 degrees - Does your knee hyperextend at least 10 degrees? Yes indicates a positive test.

☐ I do not test positive for any of the above.

Q13 Prior to starting your professional career, did you have any NECK injuries that required you to seek medical attention?

○ Yes

○ No

Q17 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q134 How was it sustained?

- [ ] While playing a sport
- [ ] While exercising
- [ ] Work
- [ ] Accident
- [ ] Hobby/recreation
- [ ] Other, please explain _____

Q133 What treatment did you seek? (select all that apply)

- [ ] Physical Therapy
- [ ] Occupational Therapy
- [ ] Medical Doctor
- [ ] Doctor of Osteopathy
- [ ] Chiropractor
- [ ] Massage Therapist
- [ ] Accupuncturist
- [ ] Natropathic Practitioner
- [ ] Physician Assistant
- [ ] Nurse Practitioner
- [ ] Self treated
- [ ] Other _____

Q169 Prior to starting your professional career, did you have any LOW BACK/ SI injuries that required you to seek medical attention?

○ Yes

○ No

Q170 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q171 How was it sustained?

☐ While playing a sport

☐ While exercising

☐ Work

☐ Accident

☐ Hobby/recreation

☐ Other, please explain _____

Q172 What treatment did you seek? (select all that apply)

☐ Physical Therapy

☐ Occupational Therapy

☐ Medical Doctor

☐ Doctor of Osteopathy

☐ Chiropractor

☐ Massage Therapist

☐ Accupuncturist

☐ Natropathic Practitioner

☐ Physician Assistant

☐ Nurse Practitioner

☐ Self Treated

☐ Other _____

Q173 Prior to starting your professional career, did you have any SHOULDER injuries that required you to seek medical attention?

○ Yes

○ No

Q174 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q175 How was it sustained?

- ☐ While playing a sport
- ☐ While exercising
- ☐ Work
- ☐ Accident
- ☐ Hobby/recreation
- ☐ Other, please explain _____

Q176 What treatment did you seek? (select all that apply)

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner

☐ Physician Assistant

☐ Nurse Practitioner

☐ Self Treated

☐ Other _____

Q177 Prior to starting your professional career, did you have any ELBOW injuries that required you to seek medical attention?

○ Yes

○ No

Q178 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q179 How was it sustained?

☐ While playing a sport

☐ While exercising

☐ Work

☐ Accident

☐ Hobby/recreation

☐ Other, please explain _____

Q180 What treatment did you seek? (select all that apply)

☐ Physical Therapy

☐ Occupational Therapy

☐ Medical Doctor

☐ Doctor of Osteopathy

☐ Chiropractor

☐ Massage Therapist

☐ Accupuncturist

☐ Natropathic Practitioner

☐ Physician Assistant

☐ Nurse Practitioner

☐ Self Treated

☐ Other _____

Q181 Prior to starting your professional career, did you have any WRIST injuries that required you to seek medical attention?

○ Yes

○ No

Q182 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q183 How was it sustained?

- [ ] While playing a sport
- [ ] While exercising
- [ ] Work
- [ ] Accident
- [ ] Hobby/recreation
- [ ] Other, please explain _____

Q184 What treatment did you seek? (select all that apply)

- [ ] Physical Therapy
- [ ] Occupational Therapy
- [ ] Medical Doctor
- [ ] Doctor of Osteopathy
- [ ] Chiropractor
- [ ] Massage Therapist
- [ ] Accupuncturist
- [ ] Natropathic Practitioner
- [ ] Physician Assistant
- [ ] Nurse Practitioner
- [ ] Self Treated
- [ ] Other _____

Q185 Prior to starting your professional career, did you have any FINGER injuries that required you to seek medical attention?

○ Yes

○ No

Q186 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q187 How was it sustained?

☐ While playing a sport

☐ While exercising

☐ Work

☐ Accident

☐ Hobby/recreation

☐ Other, please explain _____

Q188 What treatment did you seek? (select all that apply)

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant
- ☐ Nurse Practitioner
- ☐ Self Treated
- ☐ Other _____

Q189 Prior to starting your professional career, did you have any HIP injuries that required you to seek medical attention?

- ○ Yes
- ○ No

Q190 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q191 How was it sustained?

- ☐ While playing a sport
- ☐ While exercising
- ☐ Work
- ☐ Accident
- ☐ Hobby/recreation
- ☐ Other, please explain _____

Q192 What treatment did you seek? (select all that apply)

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant
- ☐ Nurse Practitioner
- ☐ Self Treated
- ☐ Other _____

Q193 Prior to starting your professional career, did you have any KNEE injuries that required you to seek medical attention?

- ○ Yes
- ○ No

Q194 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q195 How was it sustained?

- ☐ While playing a sport
- ☐ While exercising
- ☐ Work
- ☐ Accident
- ☐ Hobby/recreation
- ☐ Other, please explain _____

Q196 What treatment did you seek? (select all that apply)

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner

☐ Physician Assistant

☐ Nurse Practitioner

☐ Self Treated

☐ Other _____

Q197 Prior to starting your professional career, did you have any ANKLE injuries that required you to seek medical attention?

○ Yes

○ No

Q198 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q199 How was it sustained?

- [ ] While playing a sport
- [ ] While exercising
- [ ] Work
- [ ] Accident
- [ ] Hobby/recreation
- [ ] Other, please explain _____

Q200 What treatment did you seek? (select all that apply)

- [ ] Physical Therapy
- [ ] Occupational Therapy
- [ ] Medical Doctor
- [ ] Doctor of Osteopathy
- [ ] Chiropractor
- [ ] Massage Therapist
- [ ] Accupuncturist
- [ ] Natropathic Practitioner
- [ ] Physician Assistant
- [ ] Nurse Practitioner
- [ ] Self Treated
- [ ] Other _____

Q201 Prior to starting your professional career, did you have any TOE injuries that required you to seek medical attention?

○ Yes

○ No

Q202 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q203 How was it sustained?

☐ While playing a sport

☐ While exercising

☐ Work

☐ Accident

☐ Hobby/recreation

☐ Other, please explain _____

Q204 What treatment did you seek? (select all that apply)

☐ Physical Therapy

☐ Occupational Therapy

☐ Medical Doctor

☐ Doctor of Osteopathy

☐ Chiropractor

☐ Massage Therapist

☐ Accupuncturist

☐ Natropathic Practitioner

☐ Physician Assistant

☐ Nurse Practitioner

☐ Self Treated

☐ Other _____

Q45 Have you had any injuries that required you to seek medical attention since starting your professional career?

○ Yes

○ No

Q44 DURING your professional career, have you sought medical attention for a NECK injury?

○ Yes

○ No

Q43 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q21 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q22 Was this a work related injury?

- ○ Yes
- ○ No

Q27 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q28 What treatment did you seek? (select all that apply)

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant

☐ Nurse Practitioner

☐ Self Treated

☐ Other _____

Q29 Was this a recurring injury?

○ Yes

○ No

Q159 In total, how many times has this injury occurred?

▼ 2 ... 7

Q54 DURING your professional career, have you sought medical attention for a LOW BACK/ SI injury?

○ Yes

○ No

Q46 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q49 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q47 Was this a work related injury?

○ Yes

○ No

Q48 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q50 What treatment did you seek?

☐ Physical Therapy

☐ Occupational Therapy

☐ Medical Doctor

☐ Doctor of Osteopathy

☐ Chiropractor

☐ Massage Therapist

☐ Accupuncturist

☐ Natropathic Practitioner

☐ Physician Assistant

☐ Nurse Practitioner

☐ Self Treated

☐ Other _____

Q51 Was this a recurring injury?

○ Yes

○ No

Q158 In total, how many times has this injury occurred?

▼ 2 ... 7

Q56 DURING your professional career, have you sought medical attention for a SHOULDER injury?

○ Yes

○ No

Q59 Type of Injury (if multiple, describe most severe)

○ Sprain

○ Strain

○ Dislocation

○ Fracture

○ Other, please explain _____

Q60 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q61 Was this a work related injury?

○ Yes

○ No

Q62 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q63 What treatment did you seek?

- [ ] Physical Therapy
- [ ] Occupational Therapy
- [ ] Medical Doctor
- [ ] Doctor of Osteopathy
- [ ] Chiropractor
- [ ] Massage Therapist
- [ ] Accupuncturist
- [ ] Natropathic Practitioner
- [ ] Physician Assistant
- [ ] Nurse Practitioner
- [ ] Self Treated
- [ ] Other _____

Q64 Was this a recurring injury?

- ○ Yes
- ○ No

Q160 In total, how many times has this injury occurred?

▼ 2 ... 7

Q65 DURING your professional career, have you sought medical attention for an ELBOW injury?

- ○ Yes
- ○ No

Q66 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q67 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q68 Was this a work related injury?

- ○ Yes
- ○ No

Q69 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q70 What treatment did you seek?

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant
- ☐ Nurse Practitioner
- ☐ Self Treated
- ☐ Other _____

Q71 Was this a recurring injury?

- ○ Yes
- ○ No

Q161 In total, how many times has this injury occurred?

▼ 2 ... 7

Q74 DURING your professional career, have you sought medical attention for a WRIST injury?

- ○ Yes
- ○ No

Q75 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q76 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q77 Was this a work related injury?

- ○ Yes
- ○ No

Q78 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q79 What treatment did you seek?

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant
- ☐ Nurse Practitioner
- ☐ Self Treated
- ☐ Other _____

Q80 Was this a recurring injury?

- ○ Yes
- ○ No

Q162 In total, how many times has this injury occurred?

▼ 2 ... 7

Q83 DURING your professional career, have you sought medical attention for FINGER injury(ies)?

- ○ Yes
- ○ No

Q84 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q85 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q86 Was this a work related injury?

- ○ Yes
- ○ No

Q87 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q88 What treatment did you seek?

- [ ] Physical Therapy
- [ ] Occupational Therapy
- [ ] Medical Doctor
- [ ] Doctor of Osteopathy
- [ ] Chiropractor
- [ ] Massage Therapist
- [ ] Accupuncturist
- [ ] Natropathic Practitioner
- [ ] Physician Assistant
- [ ] Nurse Practitioner
- [ ] Self Treated
- [ ] Other _____

Q89 Was this a recurring injury?

- ○ Yes
- ○ No

Q163 In total, how many times has this injury occurred?

▼ 2 ... 7

Q92 DURING your professional career, have you sought medical attention for a HIP injury?

- ○ Yes
- ○ No

Q93 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q94 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q95 Was this a work related injury?

- ○ Yes
- ○ No

Q96 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q97 What treatment did you seek?

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant
- ☐ Nurse Practitioner
- ☐ Self Treated
- ☐ Other _____

Q98 Was this a recurring injury?

- ○ Yes
- ○ No

Q164 In total, how many times has this injury occurred?

▼ 2 ... 7

Q101 DURING your professional career, have you sought medical attention for a KNEE injury?

- ○ Yes
- ○ No

Q102 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q103 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q104 Was this a work related injury?

- ○ Yes
- ○ No

Q105 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q106 What treatment did you seek?

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant
- ☐ Nurse Practitioner
- ☐ Self Treated
- ☐ Other _____

Q107 Was this a recurring injury?

- ○ Yes
- ○ No

Q165 In total, how many times has this injury occurred?

▼ 2 ... 7

Q110 DURING your professional career, have you sought medical attention for an ANKLE injury?

- ○ Yes
- ○ No

Q111 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q112 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q113 Was this a work related injury?

- ○ Yes
- ○ No

Q114 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q115 What treatment did you seek?

- ☐ Physical Therapy
- ☐ Occupational Therapy
- ☐ Medical Doctor
- ☐ Doctor of Osteopathy
- ☐ Chiropractor
- ☐ Massage Therapist
- ☐ Accupuncturist
- ☐ Natropathic Practitioner
- ☐ Physician Assistant
- ☐ Nurse Practitioner
- ☐ Self Treated
- ☐ Other _____

Q116 Was this a recurring injury?

- ○ Yes
- ○ No

Q166 In total, how many times has this injury occurred?

▼ 2 ... 7

Q119 DURING your professional career, have you sought medical attention for a TOE injury(ies)?

- ○ Yes
- ○ No

Q120 Type of Injury (if multiple, describe most severe)

- ○ Sprain
- ○ Strain
- ○ Dislocation
- ○ Fracture
- ○ Other, please explain _____

Q121 In which year post graduation did you sustained this injury?

▼ 1st year ... 5th year

Q122 Was this a work related injury?

- ○ Yes
- ○ No

Q123 How much work was missed due to the injury?

▼ 0 hours ... > 1 month

Q124 What treatment did you seek?

- [ ] Physical Therapy
- [ ] Occupational Therapy
- [ ] Medical Doctor
- [ ] Doctor of Osteopathy
- [ ] Chiropractor
- [ ] Massage Therapist
- [ ] Accupuncturist
- [ ] Natropathic Practitioner
- [ ] Physician Assistant
- [ ] Nurse Practitioner
- [ ] Self Treated
- [ ] Other _____

Q125 Was this a recurring injury?

- ○ Yes
- ○ No

Q167 In total, how many times has this injury occurred?

▼ 2 ... 7

Q30 Have any of the reported injuries required you to change practice settings?

- ○ Yes
- ○ No

Q32 What setting were you working in when you were injured?

- ☐ Outpatient Orthopedics
- ☐ Outpatient Neuro
- ☐ Pediatrics
- ☐ Inpatient Neuro
- ☐ Acute Care
- ☐ Sports Medicine
- ☐ Skilled Nursing Facility
- ☐ Health and Wellness Facility
- ☐ Patient's Home/Home Care
- ☐ School System
- ☐ Community Outreach
- ☐ Mental Health
- ☐ Other, Specify _____

Q33 What setting did you change to after the injury?

- [ ] Outpatient Orthopedics
- [ ] Outpatient Neuro
- [ ] Pediatrics
- [ ] Inpatient Neuro
- [ ] Acute Care
- [ ] Sports Medicine
- [ ] Skilled Nursing Facility
- [ ] Health and Wellness Facility
- [ ] Patient's Home/Home Care
- [ ] School System
- [ ] Community Outreach
- [ ] Mental Health
- [ ] was not able to return to practice
- [ ] Other, Specify _____

Q36 Are there techniques you no longer practice due to injury or fear of injury?

- ○ Yes
- ○ No

Q37 What techniques do you no longer use? (select all that apply)

- ☐ Manual Therapy
- ☐ Therapeutic Exercise
- ☐ Mobility Training
- ☐ PNF
- ☐ Ambulation
- ☐ Neuromuscular Re-education
- ☐ Therapeutic Activities
- ☐ Pool Therapy
- ☐ Other _____

Q34 Since your injury, have you applied any protective behaviors to avoid re-injuring? (select all that apply)

- [ ] Use PTAs/Aides to help perform physically stressful tasks.
- [ ] Get help from someone when handling heavy patients.
- [ ] Pause regularly to stretch and adjust posture.
- [ ] Adjust plinth/bed height before treating a patient.
- [ ] Warm up and stretch before manual techniques.
- [ ] Stop treatment if it aggravates my discomfort.
- [ ] Use electrotherapy instead of manual therapy to avoid personal stress due to injuries.
- [ ] Select techniques that will not aggravate or provoke discomfort.
- [ ] Use different part of body to administer a manual technique.
- [ ] No, I do not use self protective behaviors.

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