

Chronic Connective Tissue Injuries and Conditions: An Interpreter's Guide to Working with and Through Musculoskeletal Pain

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Abstract

American Sign Language interpreting is one of the highest risk jobs for musculoskeletal pain and fatigue for young adults. Due to the abundance of movement required on low impact joints like hands, wrists and shoulders, arthritis, carpal tunnel, and other chronic connective tissue disorders are prevalent in the field. To research this area further, one hundred nationally certified interpreters with the Registry of Interpreters of the Deaf will be surveyed and asked a series of questions surrounding their professions, any experienced pain or fatigue, and their pain coping strategies. The four principle causes for joint pain are predicted to be 1) lack of interpreter teams to alternate active interpreting, 2) improper research surrounding personal care that interpreters should participate in before, during, and after a job, 3) consistent, prolonged movement, 4) accidental, acute injuries due to the physical nature of visual languages. Hearing and Deaf interpreters can both benefit from this research because by finding the source of musculoskeletal pain, remedies can be created that are tailored to the interpreting profession.

Introduction

Repetitive Motion Injury, also known as "Cumulative trauma disorder" is the overuse of a particular musculoskeletal group to perform a task repeated hundreds to thousands of times every day. Sign Language Interpreters are constantly moving their hands, fingers, wrists, elbows, and shoulders, which can create a variety of repetitive motion injuries that are both acute and chronic. Improper posture while working can lead to back pain and hip conditions. Standing for extended periods of time often leads to leg, knee, and foot discomfort. Working in this type of field can be highly rewarding, but how should interpreters prevent these conditions, and if they do suffer with them, how should they mediate and remedy this pain without interrupting their work schedule? Pain can alter the present, but it should not dictate the future.

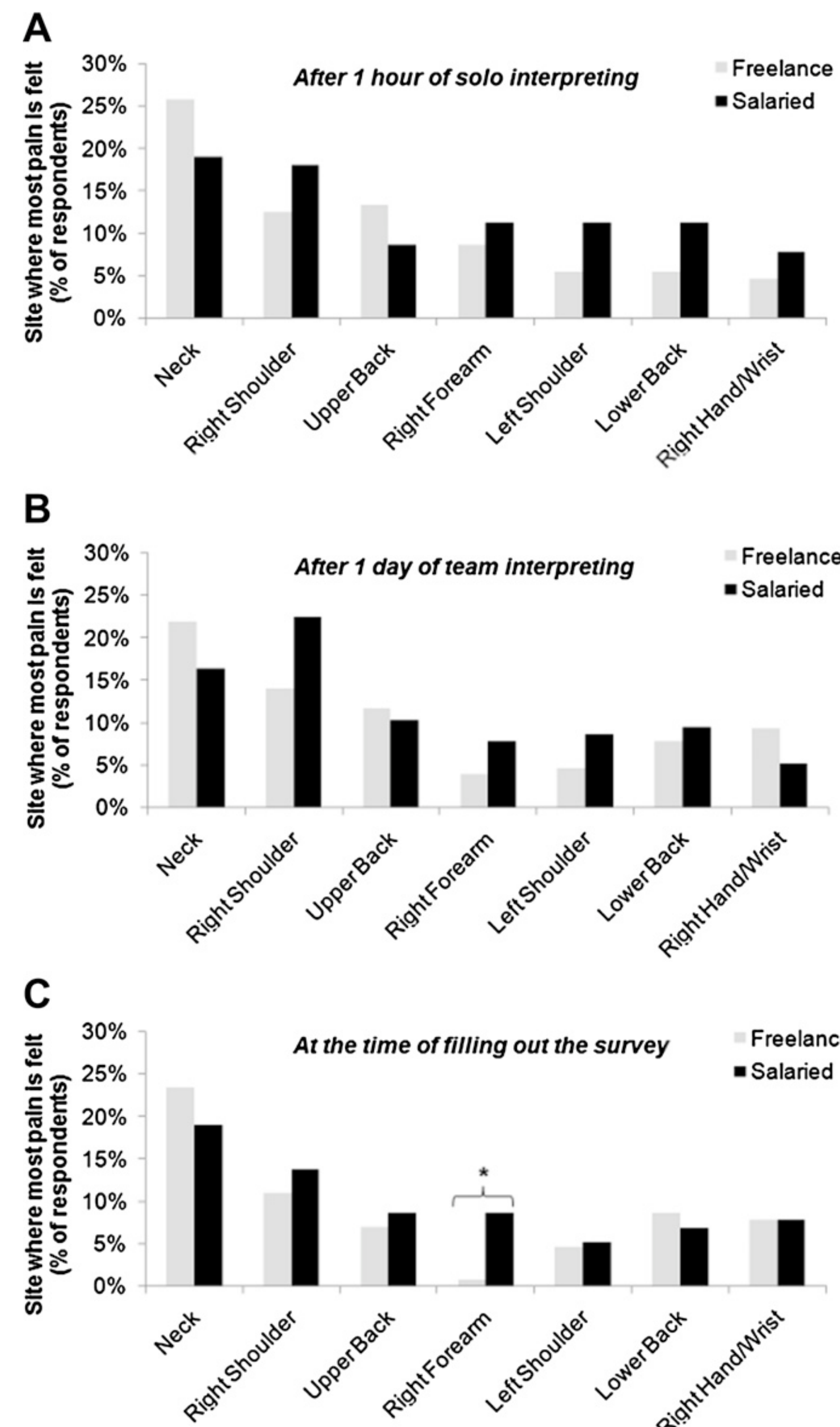
Literature Review

(Frye, 2021) – The average person should not exceed 13,000 wrist movements per day. Interpreters are estimated to have thirteen-thousand six hundred in fifty minutes, which is 1004% of what available research recommends.
(Fischer and Woodcock, 2012) – 314 AVLIC interpreters were surveyed with 38% being medically diagnosed with carpal tunnel syndrome, arthritis, bursitis, thoracic outlet syndrome or tendonitis with consistent pain identified the neck, upper back, and right upper limbs.
(Smith, Kress, and Hart, 2000) – Self-reported joint hand and wrist problems among sign language users such as interpreters, deaf or hard-of-hearing individuals, and educators. 59% percent of 184 respondents reported experiencing hand/wrist problems but refusing medical treatment.
(Rochester Institute of Technology, 2008) - Sign language interpreting is one of the highest-risk professions for ergonomic injury finding a direct link between cognitive stress of the interpreter and an increase in the risk of musculoskeletal injuries such as carpal tunnel syndrome and tendonitis.
(Marshall, and Mozrall, 2016) – Like musicians and dancers, those who open their joints early in life before joints solidify have a significantly decreased likelihood of developing pain disorders.
(Helliwell, 2004) – Psychosocial issues, workplace environment, attitude, physical conditions, and design of the job can cause joint pain via elevated blood pressure and stress. Prevention coupled with early intervention and pain management may be more effective than medicinal treatments.
(Bulgarelli et al., 2016) – Researchers created a 3D-printable, dexterous, anthropomorphic, robotic hand specifically designed to reproduce hand shapes for deaf and users to read. Increased dexterity with greater abduction/adduction degrees of freedom were placed in three fingers: thumb, index, and middle. This is because most fingerspelling and classifier handshapes utilize those three fingers.
(Kumar et al., 2020) – This failed experiment created a robot with the intent to utilize a color-coded topographical descriptor from joint distances and angles computed from joint locations. The robot would use lights and shadows to observe movement in the signer's joint angles, and it would compare these signs to its' database of preexisting signs that are downloaded in its' memory.
(Jiménez-Arberas and Diez, 2022) – An experiment studied 62 sign language interpreters suffering from musculoskeletal disorders such as tendonitis, overuse syndrome, and repetitive strain injury to determine the effects that pain had on their jobs. The interpreter's signs were more difficult to understand and involved less movement entirely to compensate for their movement pain. Nearly 70% of the interpreters experienced physical, and mental fatigue effecting their product.

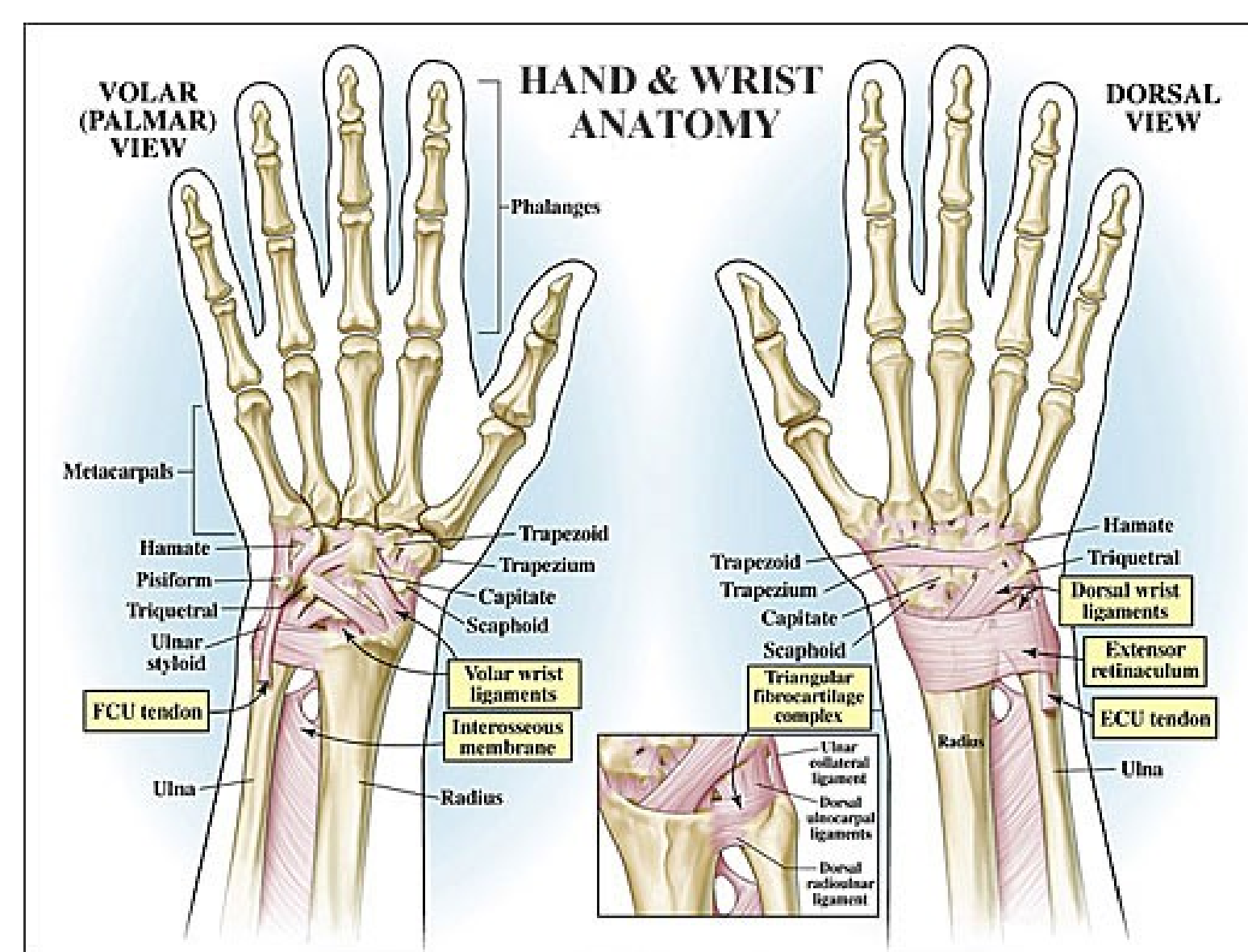
Methods

Available research indicates that interpreters are more than ten times more likely to experience joint pain if they were not raised as a native signer. This pain without necessary treatment can impact the interpreted product. To what extent does the age at which an interpreter begins to learn sign language impact their musculoskeletal pain while working? To answer this inquiry, 100 nationally certified interpreters who are members of the Registry of Interpreters for the Deaf (RID) will be anonymously provided a survey with the following questions:

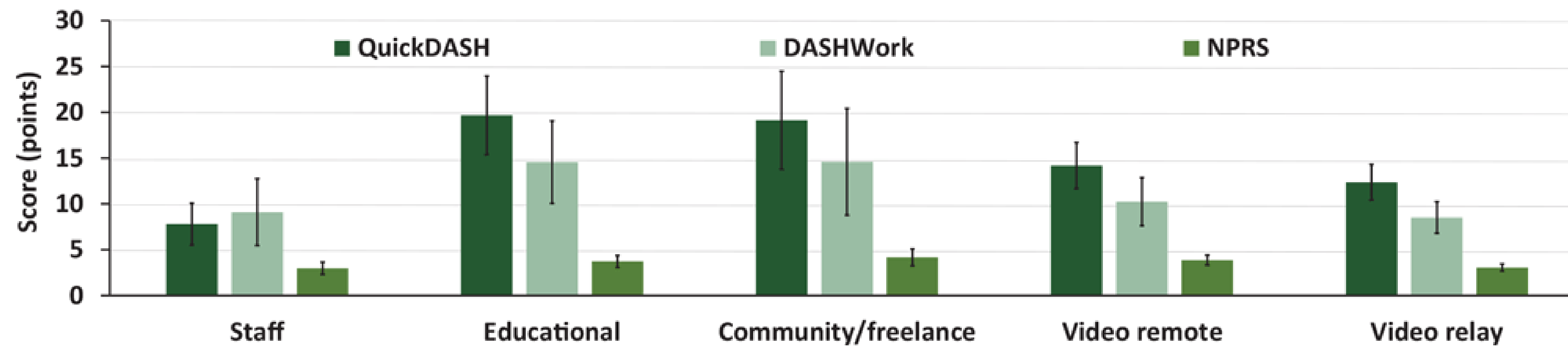
1. At what age did you begin learning sign language?
2. How old are you now?
3. How do you identify i.e., hearing, hard of hearing, deaf, Deaf, other?
4. Have you ever experienced chronic musculoskeletal fatigue and/or pain?
5. How many years had you been interpreting when you began noticing this fatigue and/or pain?
6. Has this fatigue and/or pain negatively influenced your ability to interact with consumers, agencies, d/Deaf colleagues, friends, or and/or family?
7. Has this fatigue and/or pain negatively influenced your life outside of interpreting work?
8. Have you been medically diagnosed with any connective tissue disorders?
9. Have you sought any form of medical intervention to mitigate the fatigue/pain?
10. What 'at-home' remedies have you utilized to alleviate acute or chronic fatigue/pain?
11. How much time do you typically spend before and after jobs on self-care to prevent or alleviate musculoskeletal fatigue/pain?
12. On a scale from 1-10, what is the average level of joint pain that you experience immediately after an interpreting job?



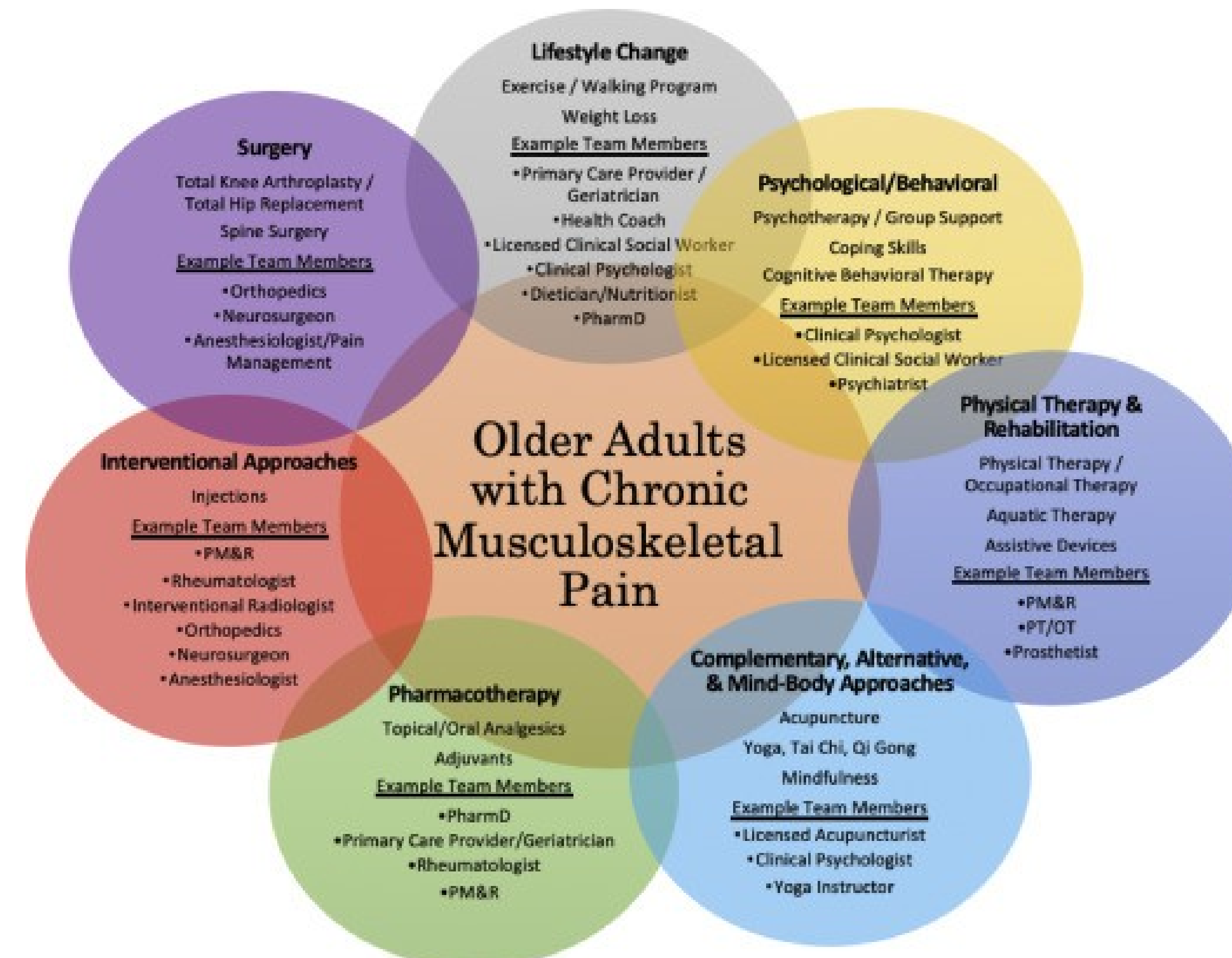
Fischer, S.L., & Woodcock, K. (2012). A cross-sectional survey of reported musculoskeletal pain, disorders, work volume and employment situation among sign language interpreters. *International Journal of Industrial Ergonomics*, 42, 335-340.



Wrist anatomy. New York, NY: Hand/Spport Surgery Institute. (2020). Retrieved from <https://handsurgonline.com/patient-education/wrist-anatomy/>



Adjusted mean (SEM) scores on the outcomes for physical health across interpreting settings, including the Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH), the optional work module on the QuickDASH (DASHWork), and Numeric Pain Rating Scale (NPRS). Abbreviation: SEM, standard error of the mean. [A tabular description of this figure is available.]



<https://www.medical.theclinics.com/article/S0025-7125%2820%2930051-1/fulltext>

	Left Hand		Right Hand	
	Early	Late	Early	Late
5% position (°)				
Flex/Ext	-29.5 (7.6)	-29.9 (9.7)	-26.6 (11.9)	-30.8 (8.0)
Rad/Uln	-23.3 (5.1)	-18.0 (10.2)	-15.0 (6.3)	-14.0 (9.1)
Mean position (°)				
Flex/Ext	-0.19 (5.6)	-2.5 (6.8)	2.8 (10.9)	-0.9 (5.6)
Rad/Uln	-5.9 (4.5)	-0.7 (10.6)	5.4 (4.2)	4.1 (6.9)
95% position (°)				
Flex/Ext	31.5 (5.9)	28.8 (10.7)	40.4 (11.8)	35.3 (5.8)
Rad/Uln	12.4 (5.1)	15.5 (11.0)	25.2 (3.5)	21.3 (6.9)
Mean velocity (°/s)				
Flex/Ext	50.5 (8.2)	52.9 (15.6)	77.0 (13.0)	75.7 (13.9)
Rad/Uln	31.2 (3.9)	31.8 (9.0)	44.2 (4.9)	40.1 (10.2)
Mean acceleration (°/s ²)				
Flex/Ext	628 (105)	658 (194)	995 (216)	1411 (166)
Rad/Uln	392 (106)	394 (49)	520 (144)	666 (89)
Pause Percentage				
Flex/Ext	14.3 (5.8)	14.4 (4.0)	5.3 (1.7)	7.4 (4.5)
Rad/Uln	19.4 (6.8)	19.0 (4.4)	9.3 (4.2)	11.2 (5.7)

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Limitations

1. Anonymity is itself a limitation. There are no ways by which the researcher could contact surveyed interpreters to clarify or expand upon their answers.
2. By only asking nationally certified interpreters, this would not include community interpreters who chose to not become nationally certified.
3. By limiting this research to one hundred participants, the researcher inadvertently excludes nearly ten thousand nationally certified interpreters that may have drastically different experiences (Ad Astra Social Team).
4. By combining joint fatigue and joint pain together into the same questionnaire, it would be difficult to conclude whether the described symptoms are due to injury, muscular tearing, arthritis, or a lack of sleep

Conclusion

American Sign Language interpreters are exponentially more likely to experience connective tissue disorders in their wrists, shoulders, and backs due to the physically mobile nature of their jobs. This joint pain can severely impact both the interpreter and their product. Preventing this pain by exercise and stretching is preferable, but pain intervention methods like medications and surgery can also be beneficial. Interpreters who were raised learning American Sign Language before the age of three are far less likely to suffer from these chronic injuries, because their skeletal and muscular systems became accustomed to constant movement before their joints had completely solidified. By taking care of the body, interpreters can decrease the amount of serious medical intervention, but interpreters should have a primary care physician specializing in chronic pain prevention and treatment. All noble occupations are fraught with hazards, but reward of equal access to communication for the communities that are inevitably served is entirely worth the risk.

Future Work

While the Registry of Interpreters for the Deaf may be the largest organization of interpreters, they are by no means the only organization that has surveyable participants experiencing interpreter pain and fatigue. Anyone wishing to delve deeper into this research should be with the National Association of the Deaf (NAD). The NAD is an excellent place to find information surrounding Deaf interpreters who may have been raised in a signing household, in an oral language household utilizing lip reading, or those who experienced language deprivation. Interviewing Children of Deaf Adults (CODA's) who were raised in a household primarily using American Sign Language would further support the studies finding that those children, Deaf or hearing, that were raised signing are far less predisposed to chronic musculoskeletal diseases. Additionally, future researchers should consider the possibility that certain specialty fields such as educational, medical, legal, religious, and community interpreting may offer different risk factors to the interpreters who primarily work in those fields. For example, educational interpreters may be more likely to experience arthritis, but less likely to suffer from carpal tunnel syndrome than medical interpreters.

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