

Occupational Therapy and Its Role in Ergonomics

Ciria Vasquez

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Welcome!
So glad you
could be
here.



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Ciria Vasquez



B.A. IN EXERCISE AND SPORTS SCIENCE



M.S. IN EXERCISE SCIENCE



CURRENTLY WORKING TOWARDS MY OTD



ROTATIONS:

- ACUTE INPATIENT REHABILITATION
- OUTPATIENT PEDIATRICS



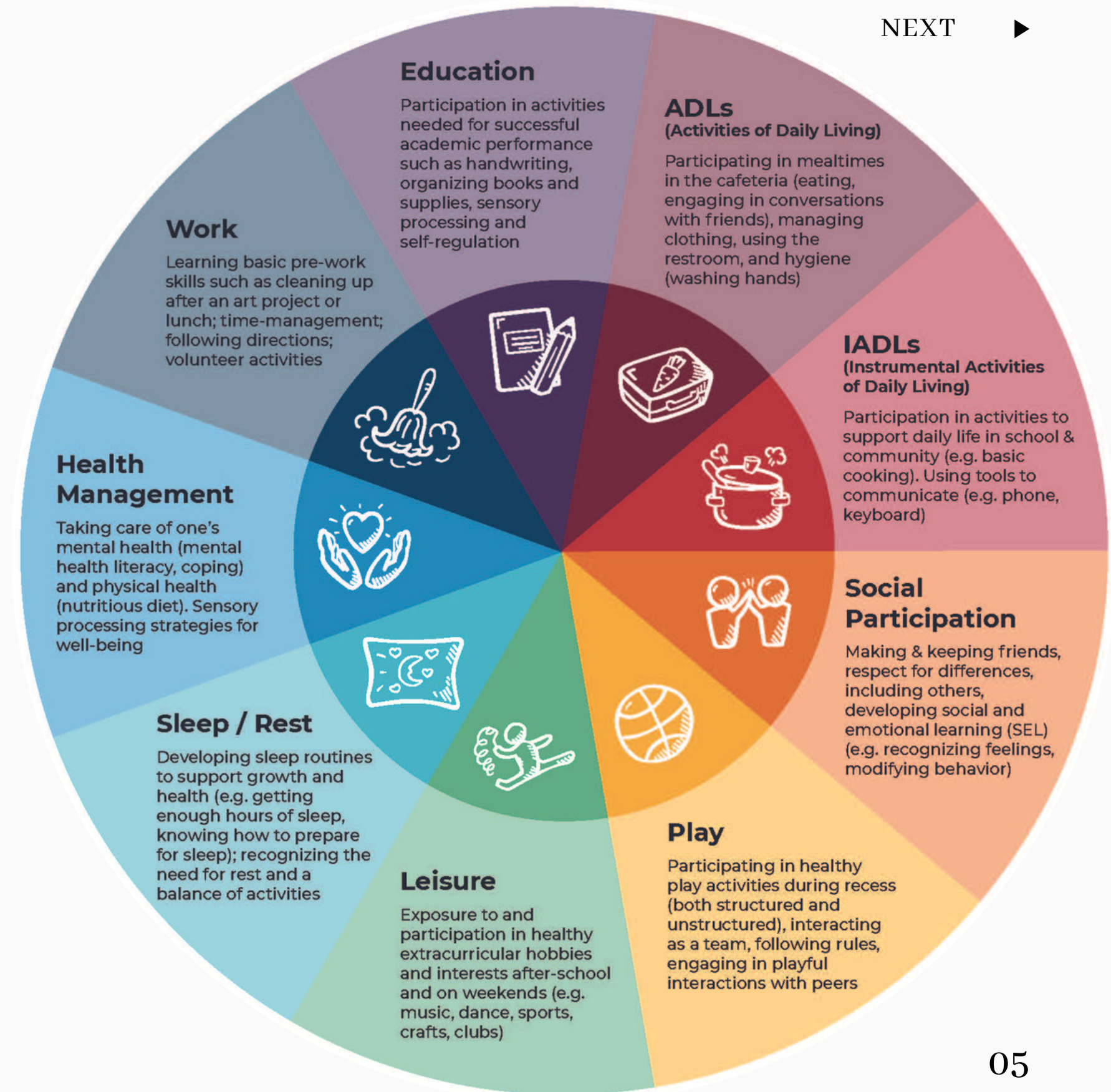
What is Occupational Therapy?

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- Branch of health care that involves the therapeutic use of everyday activities or occupations



Ergonomics

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- Ergonomics looks at the person, task, and the environment to optimize productivity.
- The goal is to mitigate musculoskeletal disorders and alleviate any discomfort you may be experiencing.

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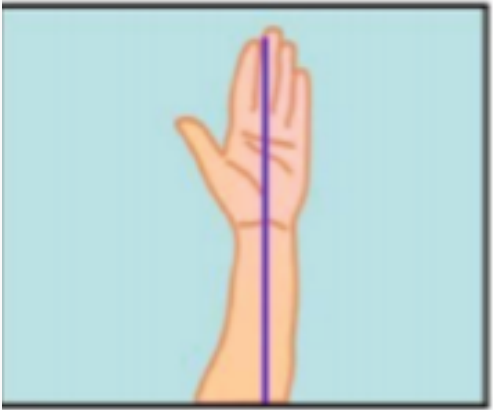


What is a musculoskeletal disorder (MSD)?

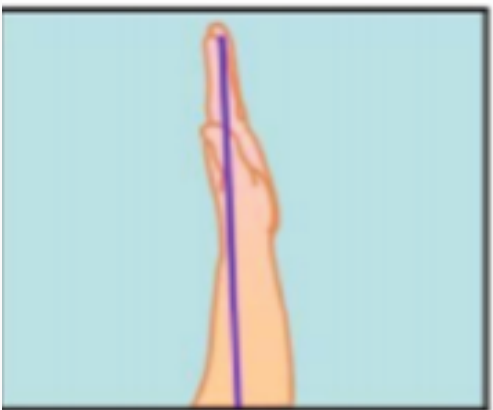
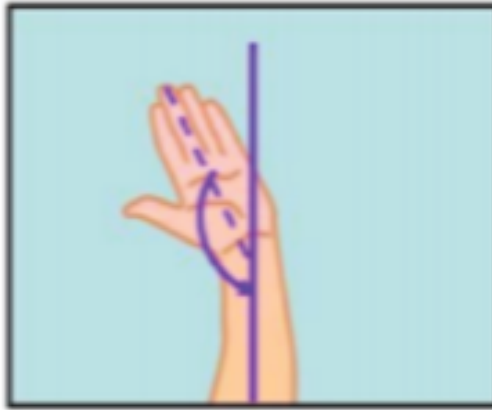
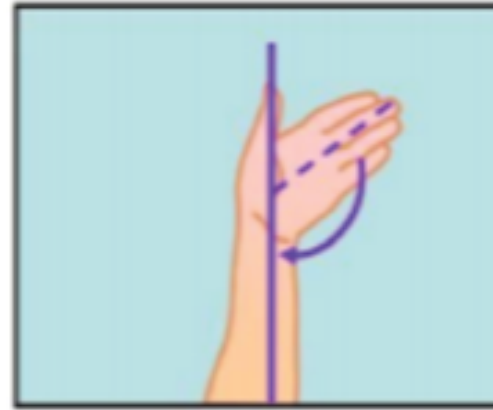
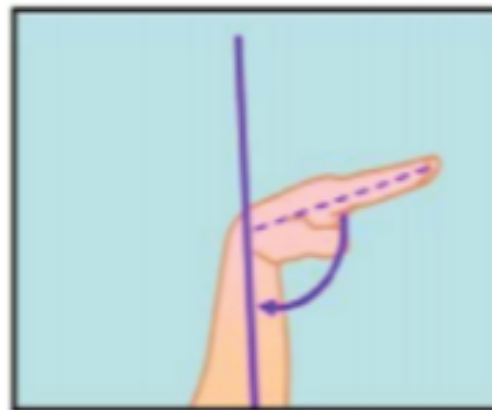
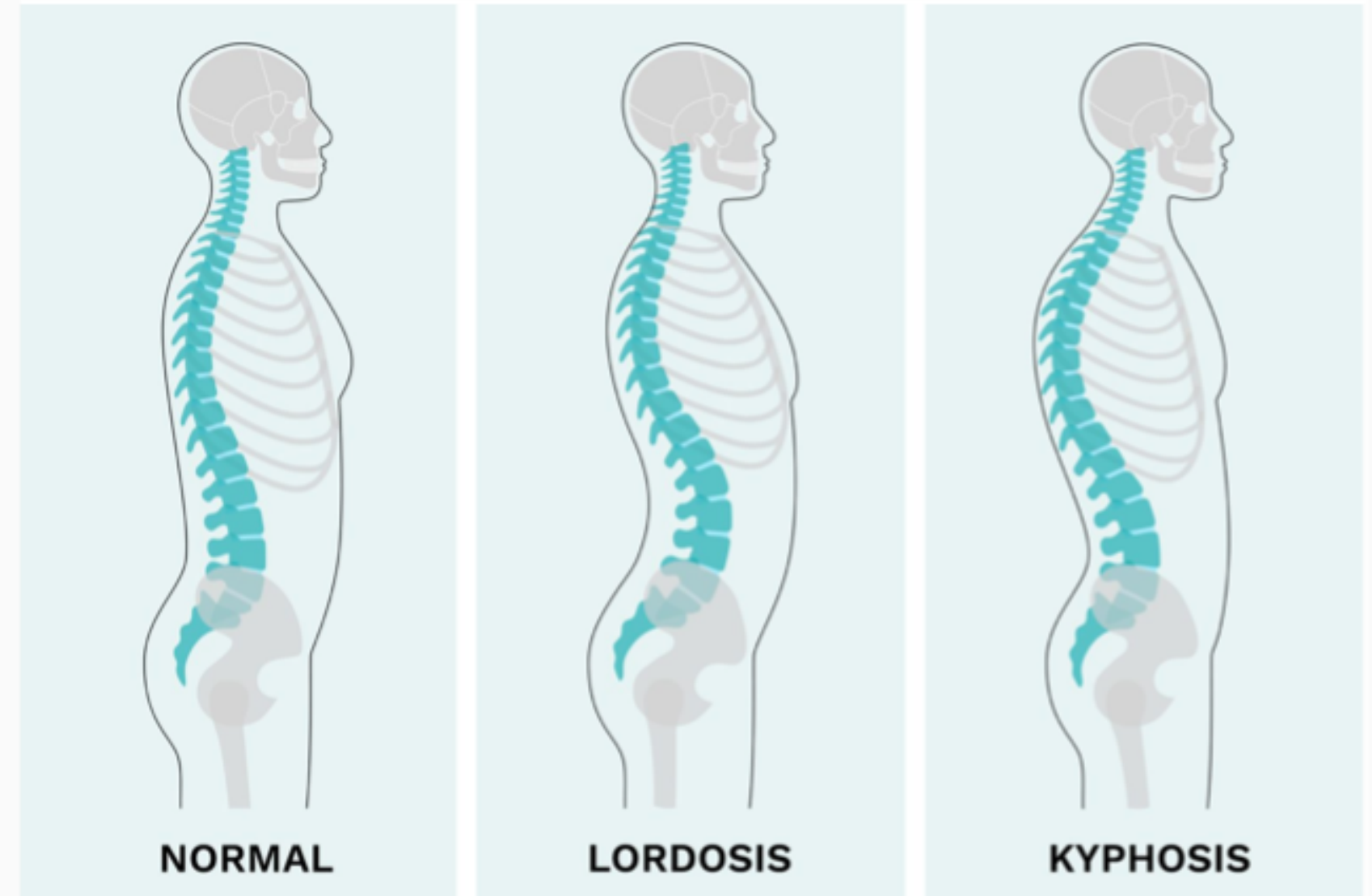
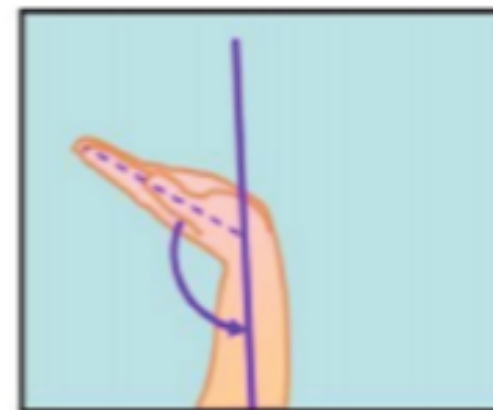
- Injury of soft tissue of the upper and lower extremities
- Caused by repetitive and sustained exertions of awkward postures and manipulations

Neutral Posture

View #1
(minimal radial/ulnar deviation)



View #2
(minimal flexion/extension)

**Awkward Postures****Radial Deviation****Ulnar Deviation****Flexion****Extension**

Research Study

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Objectives

Students will confidently know how to set up their workstation and be proactive

Contribute to the occupational therapy body of knowledge

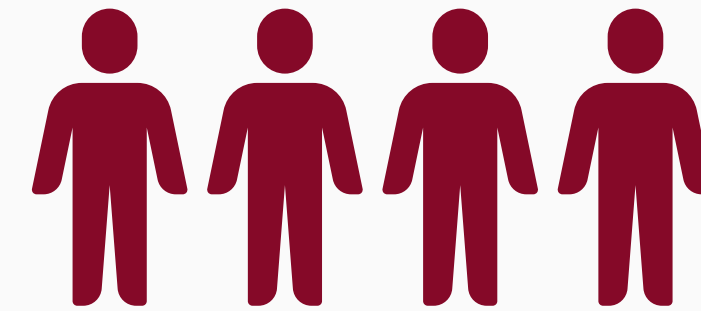
Students will be able to apply what they learned in their desired profession

Promote a safe and functional environment and maximize their academic performance and well-being

Texas Woman's University



9 Female



4 Male

*TWU's student population is 87% female, 13% male

Texas Woman's University

Instruments used:

- Rapid Office Strain Assessment (ROSA)
- Pre and Post Ergonomic Survey
- Pre and Post Wellness Survey
- Weekly Check In

Results showed the following:

- 69.2% reported using a laptop
 - 83.3% did not use an external mouse;
100% did not use an external keyboard;
91.7% did not use a laptop riser
- 53.8% reported studying for >4 hours/day during the week

Surveys

Ergonomics

Wellness

"How confident do you feel on implementing good ergonomics while studying?"

"During the last week, how often did you experience ache, pain, and discomfort?"

"Where do you mainly study/work?"

"Since the beginning of this school year, what is the average amount of sleep you get on a weeknight?"

"Since the beginning of this school year, have you experienced any problems or challenges?"

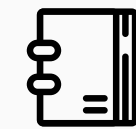
Intervention



Actively recruited students in the library



Followed up via email/text message



For the pre & post assessment, met students in the library or dorms



Observed students how they normally study using their device in their desire location

Intervention



Provided the score from the ROSA with an explanation



Based on their answers from the Ergonomic + Wellness survey, I provided an explanation



Discussed their hobbies & future profession

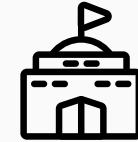


Provided a visual from observation with an explanation



Provided key takeaways

Intervention



Provided resources offered at TWU and off campus regarding sleep, physical, and mental health based on their survey responses


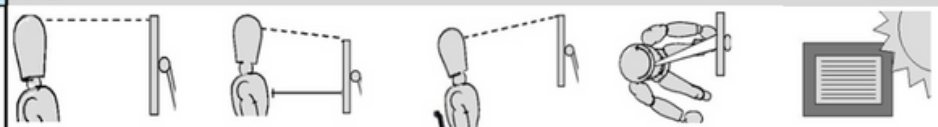

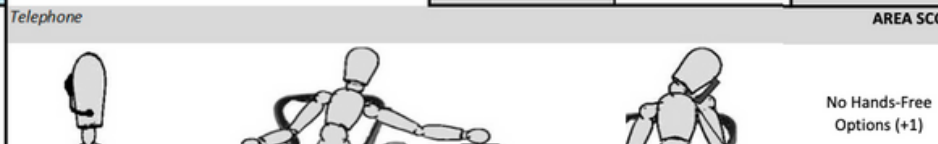

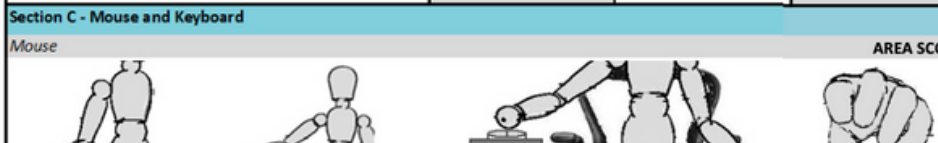


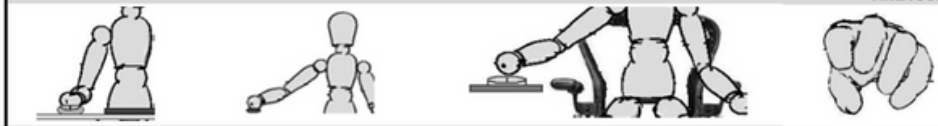
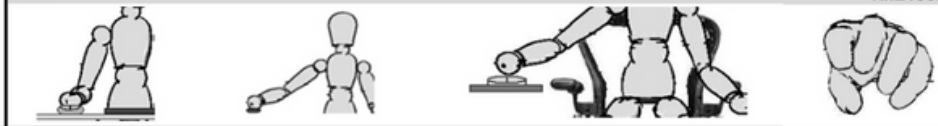




Provided stretches specific to them based on location of discomfort



Provided economical and product options based on observations and responses from surveys

ROSA

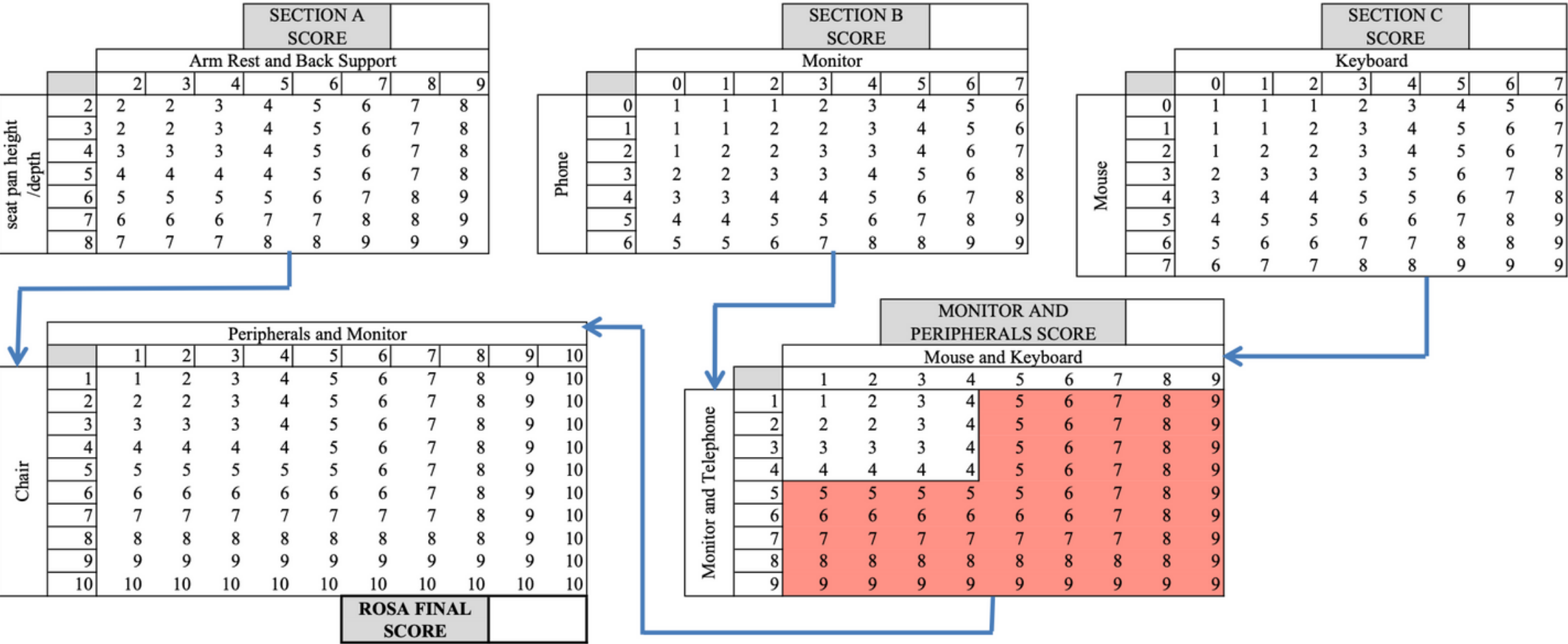
UserName _____ Date _____ Assessed By _____		Group _____		THE RAPID OFFICE STRAIN ASSESSMENT DEVELOPED BY MICHAEL SONNE, MHK, CK.										
Section A - Chair					Section B - Monitor and Telephone									
Chair Height					Monitor									
 AREA SCORE _____					 AREA SCORE _____									
Knees at 90° (1) Too low - Knee Angle <90° (2) Too High - Knee Angle >90° (2) No foot contact on ground (3) Insufficient Space Under Desk - Ability to Cross Legs(+1)					Arm's Length Distance (40-75cm) / Screen at Eye Level (1) Too Low (below 30°) (2) Too Far (+1) Too High (Neck Extension) (3) Neck Twist Greater than 30° (+1) Glare on Screen (+1) Documents - No Holder (+1)									
Pan Depth					DURATION _____									
 AREA SCORE _____					 Monitor Score _____									
Approximately 3 inches of space between knee and edge of seat (1) Too Long - Less Than 3" of space (2) Too Short - More than 3" of Space(2)					Telephone									
 AREA SCORE _____					 No Hands-Free Options (+1)									
Elbows supported in line with shoulder, shoulders relaxed (1) Too High (Shoulders Shrugged) /Low (Arms Unsupported) (2) Hard/damaged surface (+1) Too Wide (+1)					Headset / One Hand on Phone & Neutral Neck Posture (1) Too Far of Reach (outside of 30cm) (2) Neck and Shoulder Hold (+2)									
Back Support					DURATION _____									
 AREA SCORE _____					 Phone Score _____									
Adequate Lumbar Support - Chair reclined between 95°-110° (1) No Lumbar Support OR Lumbar Support not Positioned in Small of Back (2) Angled Too Far Back (Greater than 110°) OR Angled Too far forward (Less than 95°) (2) No Back Support (ie Stool, OR Worker Leaning forward) (2) Work Surface too High (Shoulders Shrugged)(+1)					Mouse									
 AREA SCORE _____					 AREA SCORE _____									
Keyboard					Mouse in Line with Shoulder (1) Reaching to Mouse (2) Mouse/Keyboard on Different Surfaces (+2) Pinch Grip on Mouse (+1) Palmrest in Front of Mouse (+1)									
 AREA SCORE _____					 AREA SCORE _____									
DURATION _____					DURATION _____									
CHAIR SCORE _____					KEYBOARD SCORE _____									
ROSA FINAL SCORE _____					ROSA SCORE _____									
DURATION INSTRUCTIONS					Peripherals and Monitor Score _____									
If less than 30 minutes continuously, or less than 1 hour per day, mark as -1. If between 30 minutes and 1 hour continuously, or between 1 and 4 hours per day, mark as 0. If greater than 1 hour continuously, or more than 4 hours per day, mark as +1.														

ROSA

RAPID OFFICE STRAIN ASSESSMENT

EMPLOYEE NAME: _____
DATE: _____
ASSESSED BY: _____

- ROSA SCORING INSTRUCTIONS**
1. Add Seat Pan and Seat Depth scores together to receive Section A vertical Axis Score. Add Arm Rest and Back Rest scores together to receive the vertical axis score. Using these scores, follow the scoring chart to receive the Chair Score. Add the appropriate duration score based on the amount of time the worker spends in the chair per day.
 2. Add the score for the Monitor with the appropriate duration score to receive the value for the horizontal axis in Section B. Add the telephone score together plus the appropriate duration score to receive the vertical axis for Section B. Using these scores, follow the scoring chart to receive the Section B score.
 3. Add the score for the keyboard to the appropriate duration score to receive the value for the horizontal axis in Section C. Add the score of the mouse to the appropriate duration score to receive the vertical axis for Section C. Using these scores, follow the scoring chart to receive the Section C score.
 4. Use the score from step 2 to receive the score for the vertical axis in the peripheral and monitor section. Use the score from step 3 to receive the score for the horizontal axis in the peripheral and monitor section.
 5. Use the score from Step 1 (Section A) to receive the value for the vertical axis in the grand score chart. Use the score from step 4 to receive the score for the horizontal axis in the grand score chart. Using these two scores, find the corresponding Grand ROSA score.

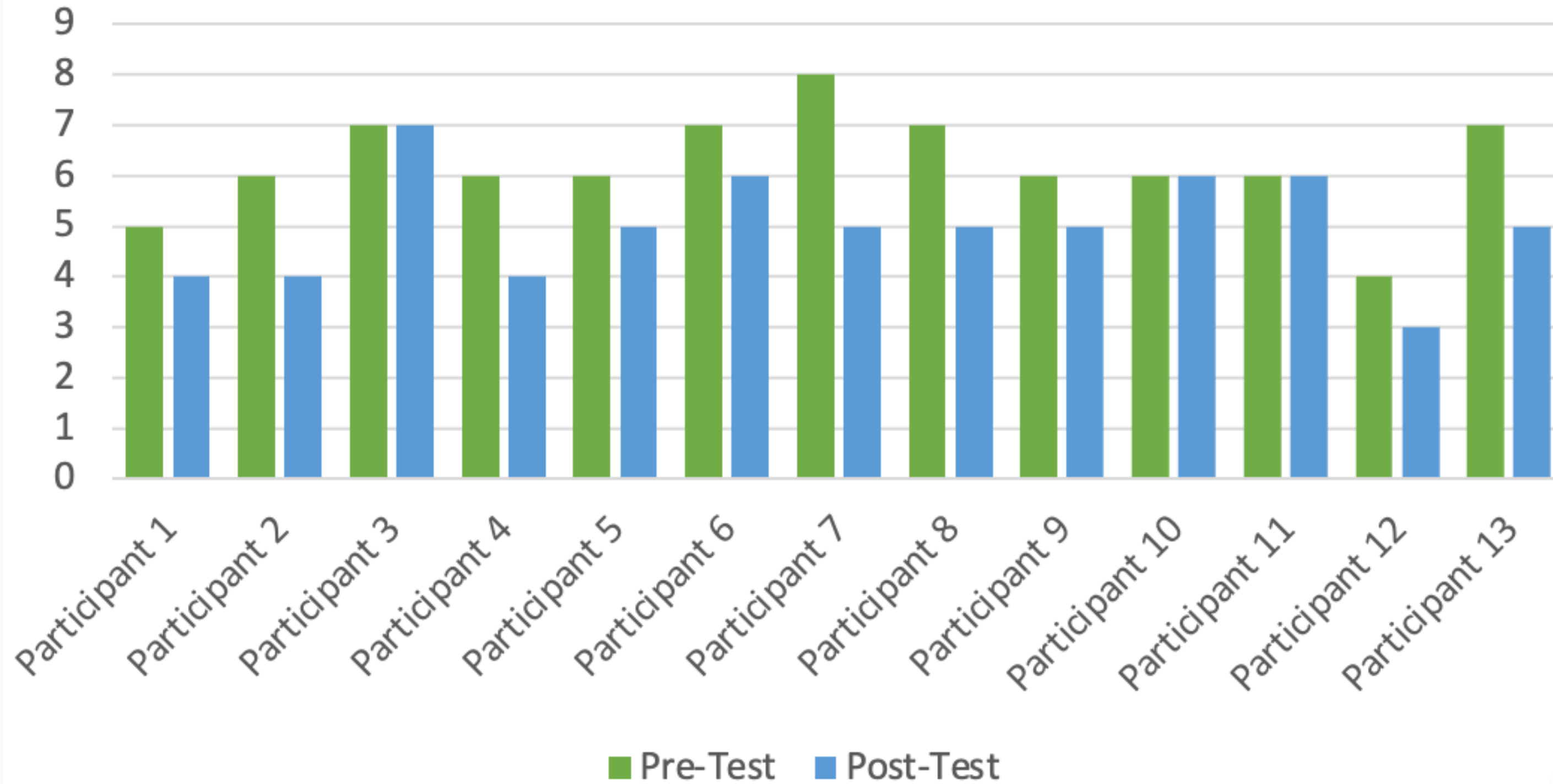


The ROSA summary report will show the scores and classify it as high risk (**red**), medium risk (**yellow**), and low risk (**green**). The scores of all ROSA assessments range from 0 to 10. Here is a general guideline of what you will need to do if you see the following scores:

ROSA Score & Colour Code	Recommended Actions
0-3	Self-adjustments and perhaps an e-mail or follow up assessment is required to resolve the issue.
4-5	Some self-adjustments can be done, but also a follow up e-mail and phone call as well as monitoring and follow up assessments.
6-10	Intervention is highly recommended either remotely or in person with phone calls and possible accommodations will be required. Active monitoring and follow up assessments will be required.

Scoring System

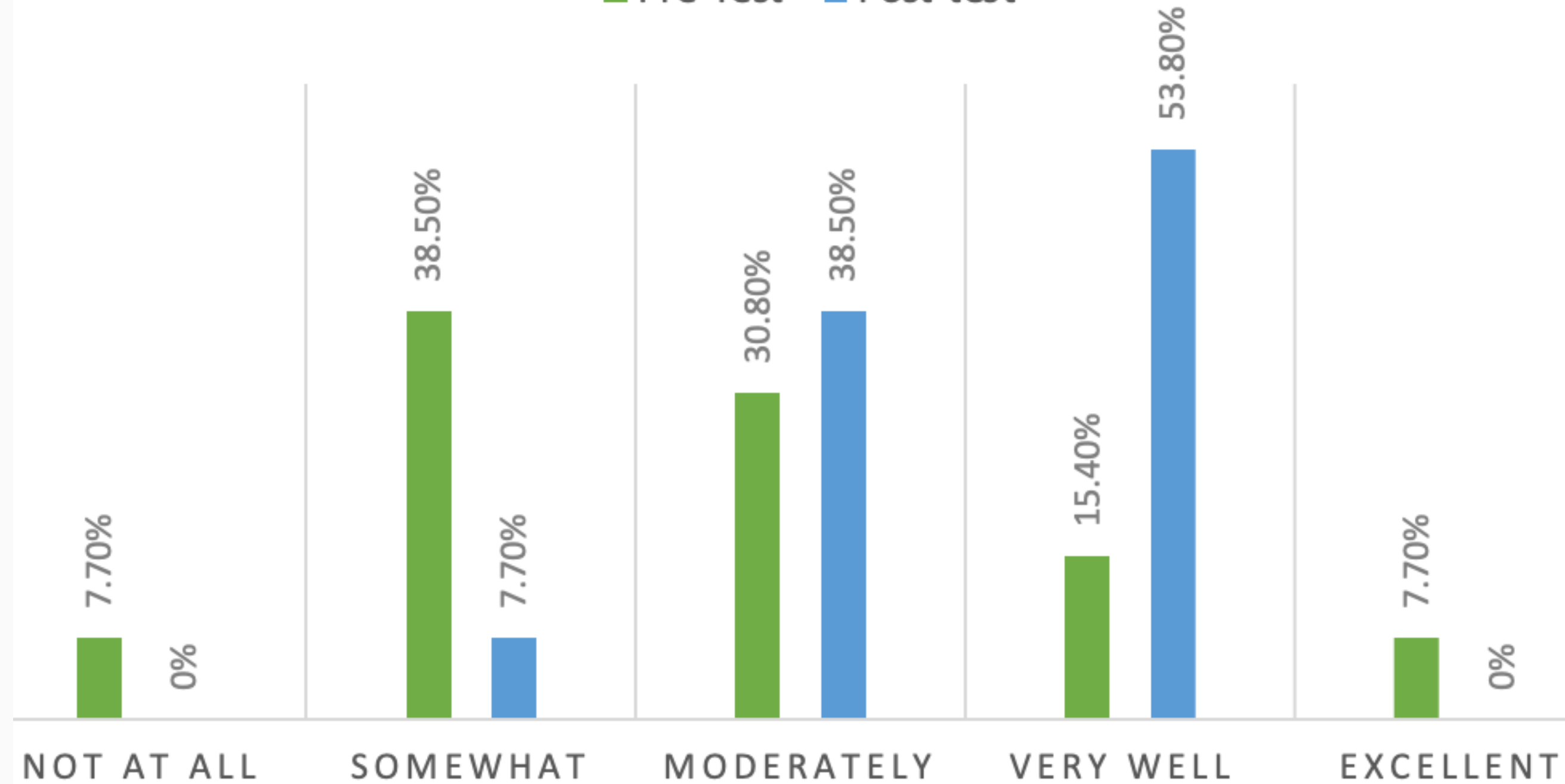
Rapid Office Strain Assessment (ROSA) Scores



**Two Tailed P-
Value:
0.000442**

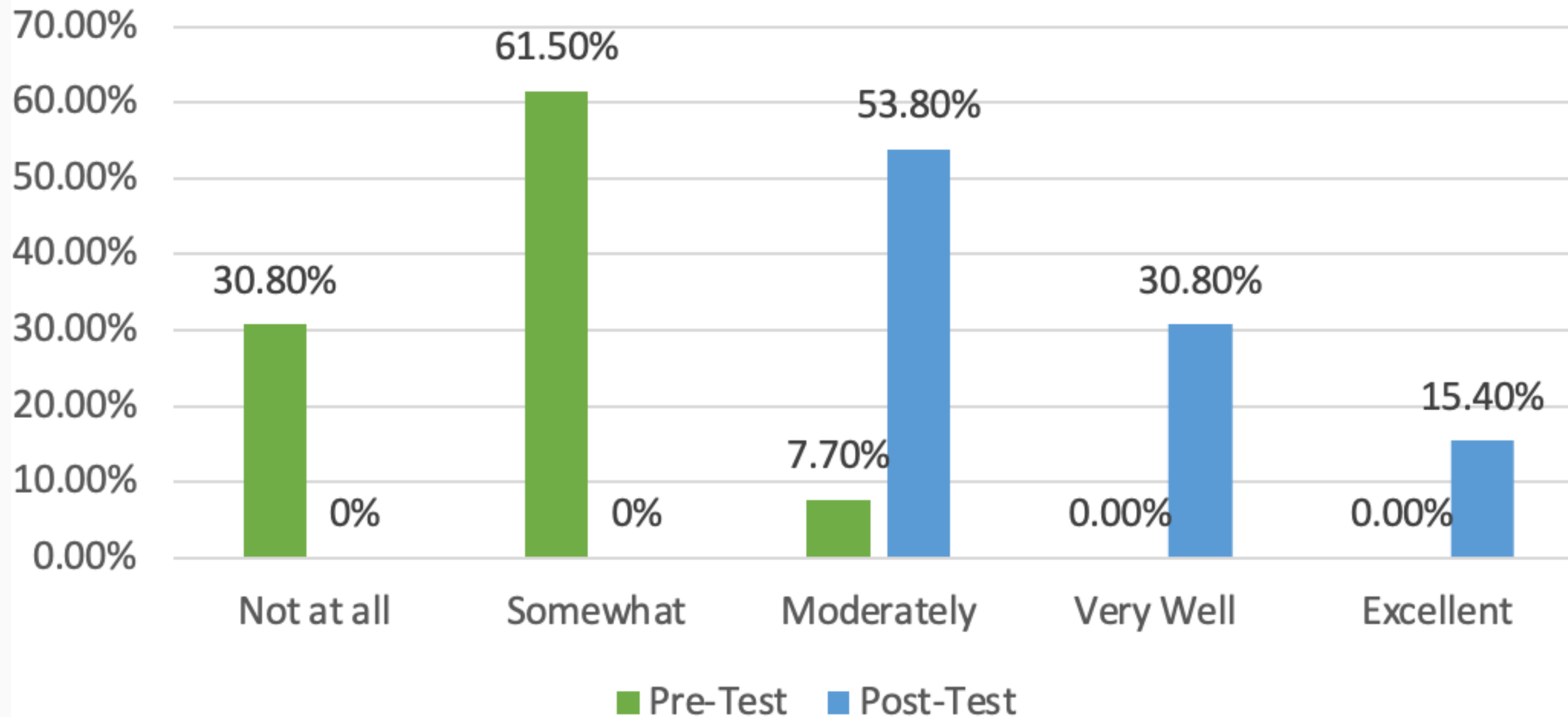
UNDERSTANDING ERGONOMICS

■ Pre-Test ■ Post-test



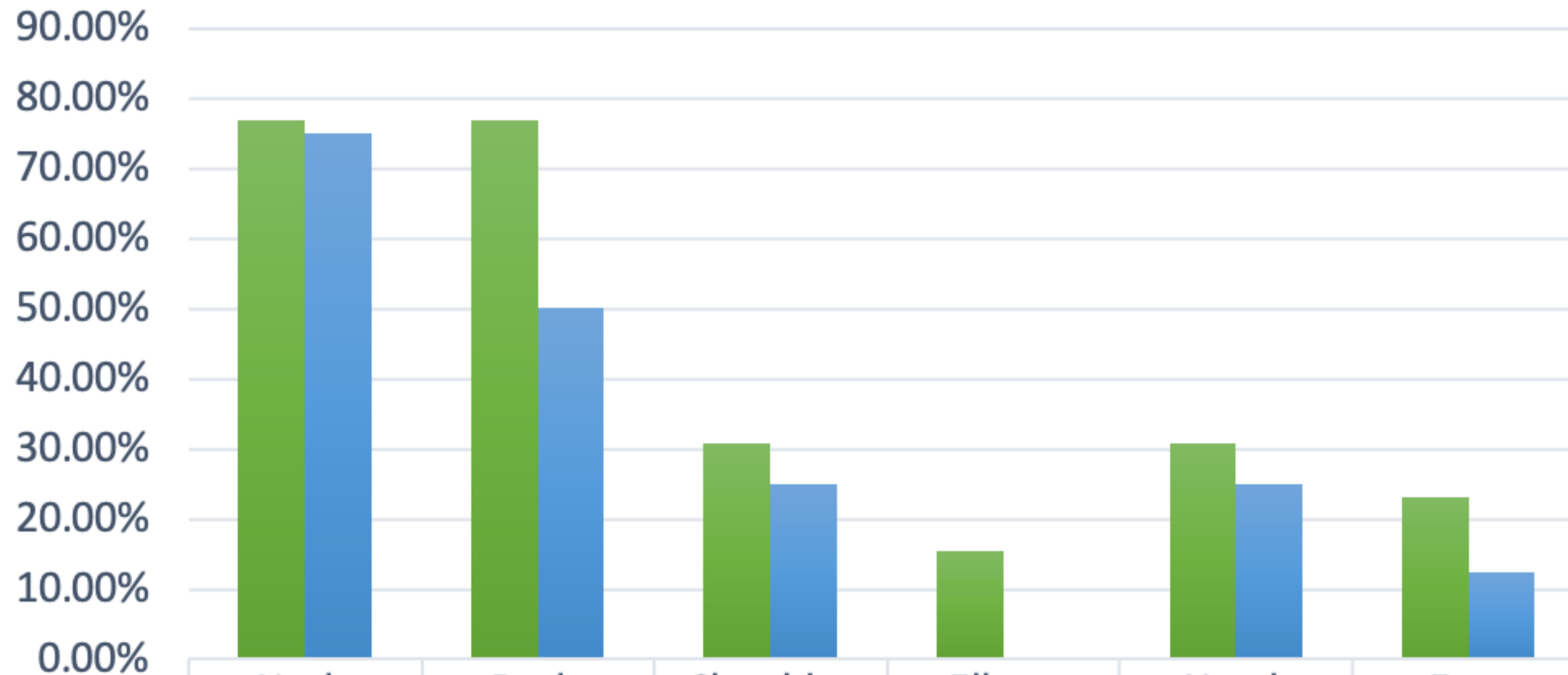
Two Tailed P-Value:
0.0323

Implementing a Workstation Confidently to Mitigate MSD



Two Tailed P-Value:
0.00014

Location of Discomfort



■ Pre-Test	76.90%	76.90%	30.80%	15.40%	30.80%	23.10%
■ Post-Test	75%	50%	25%	0%	25%	12.50%

Two Tailed P-Value:

Neck – 0.0179

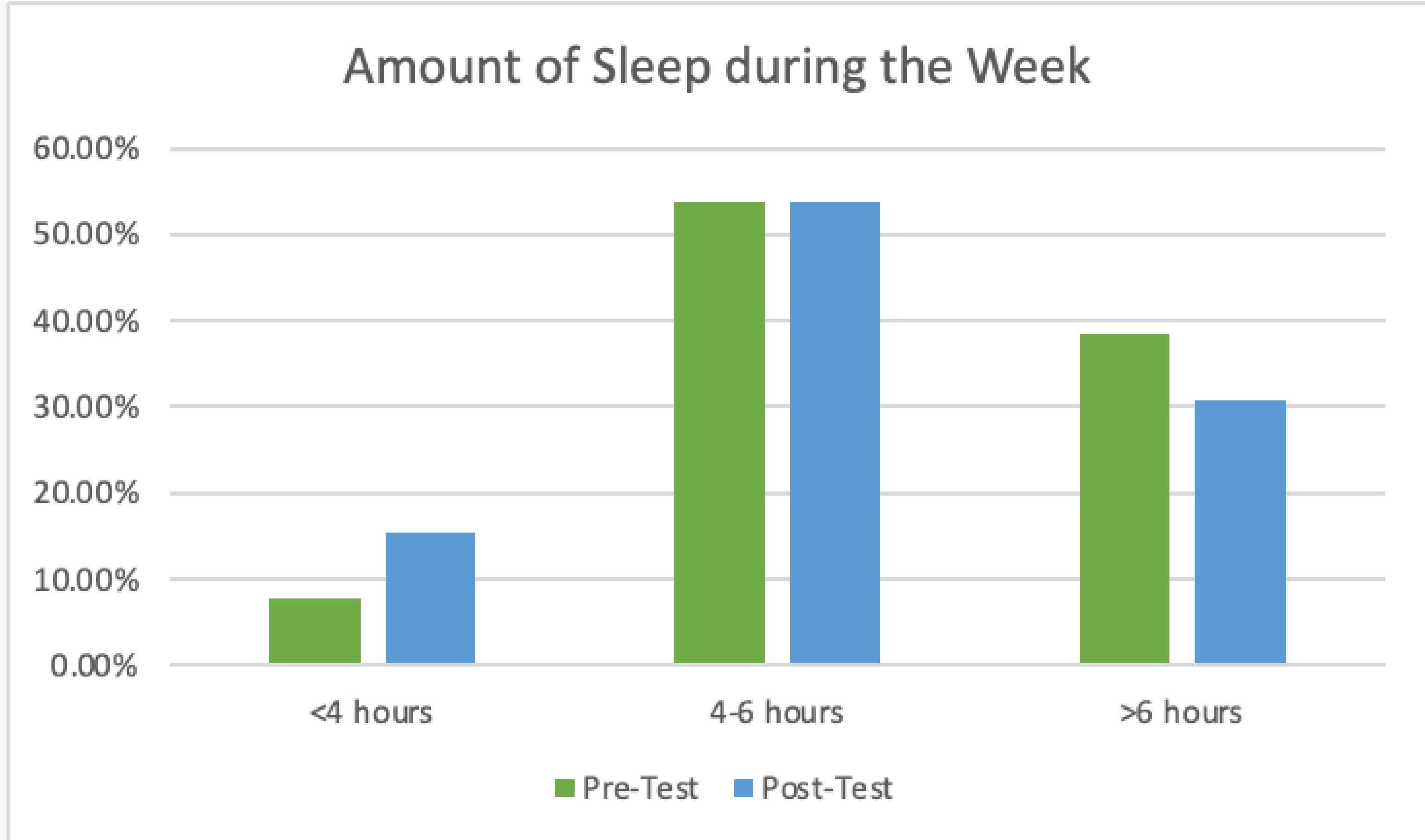
Back – 0.00089

Shoulder – 0.33704

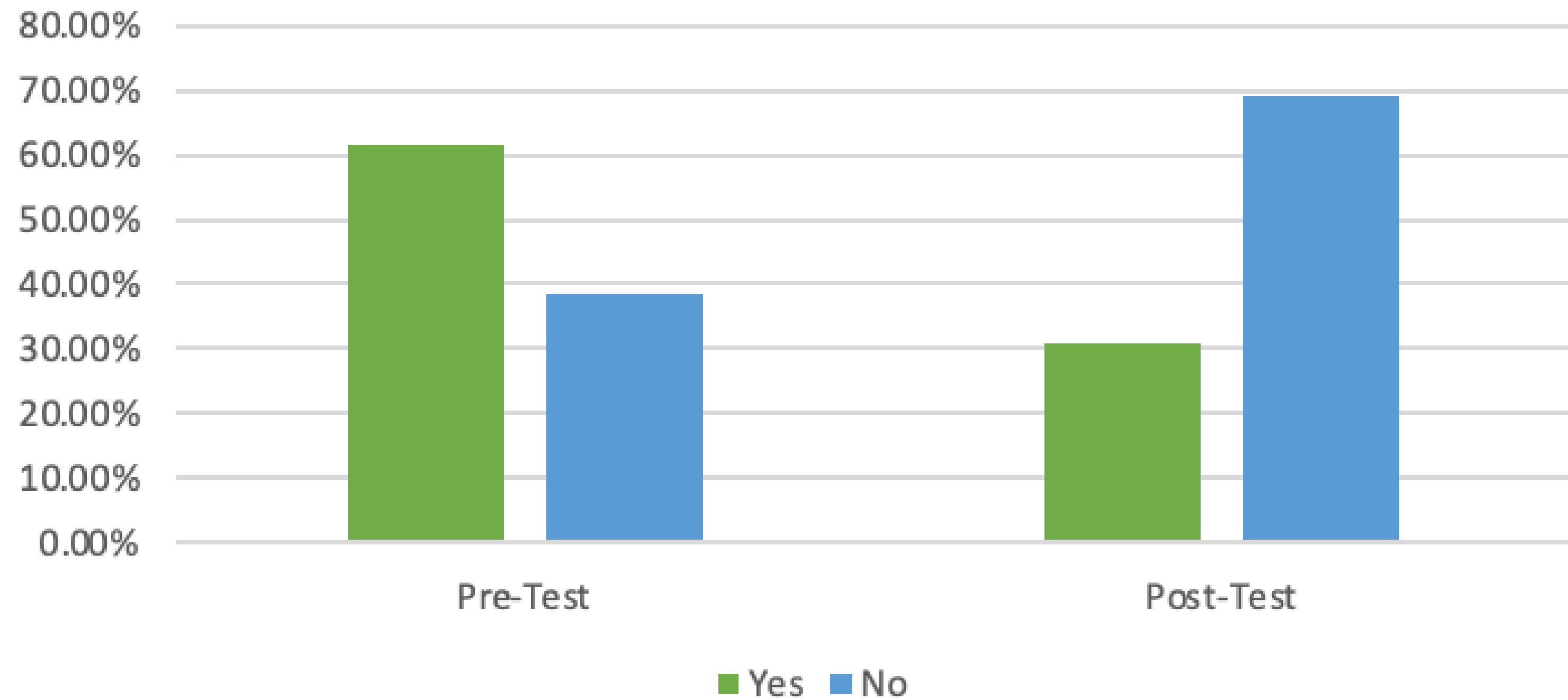
Elbow – 0.16540

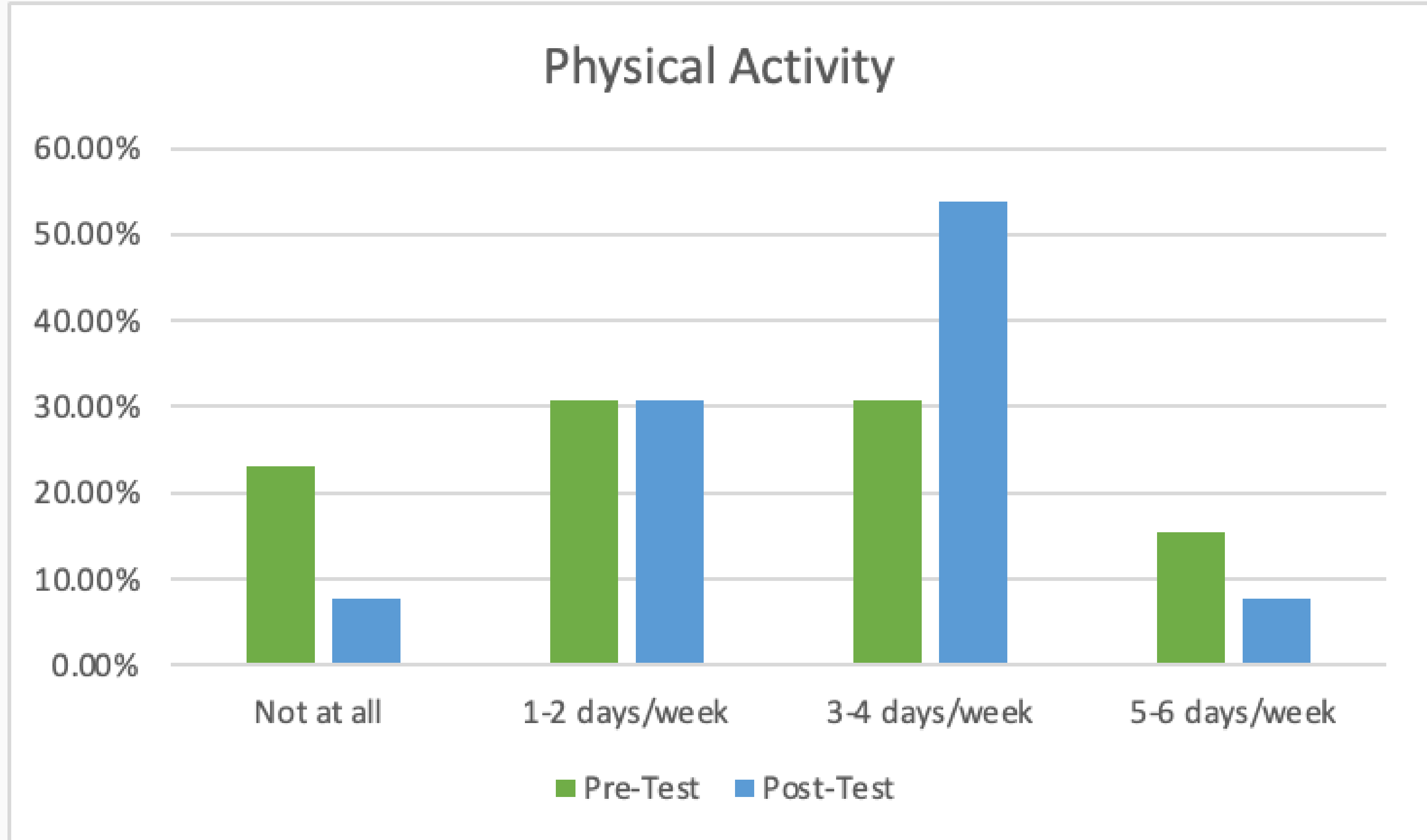
Hand – 0.33704

Eyes – 0.16540



Experience of Anxiety, Nervousness, or Depression





Summary

- 1 Muscular discomfort is prevalent in the neck, shoulder, and back region resulting in poor posture
- 2 Providing ergonomic training and demonstrating proper body mechanics resulted in alleviating discomfort
- 3 Students at universities would benefit from an occupational therapist teaching ergonomics

Sustainability

Added to the ergonomics website for TWU

- 1
 - Students
 - Faculty and Staff
 - Guidelines
 - Resources + Recommendations

Partnered with the following departments for outreach:

- 2
 - Marketing and Communications
 - Risk Management/EH&S
 - Student Health Services
 - Student Life

TWU Website



<https://twu.edu/health-safety/safety-programs/ergonomics/>

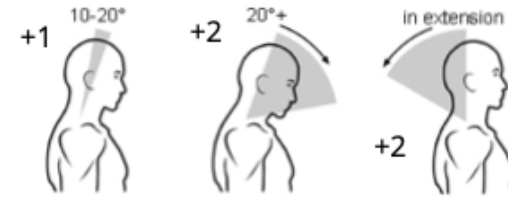
Rapid Entire Body Assessment (REBA)

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A. Neck, Trunk and Leg Analysis

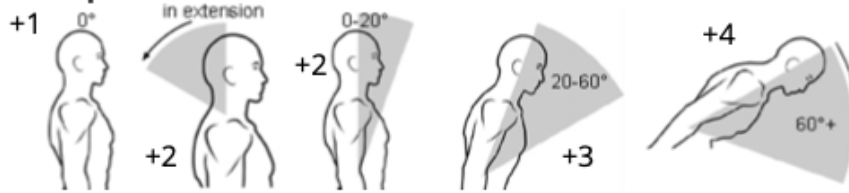
Step 1: Locate Neck Position



Step 1a: Adjust...
If neck is twisted: +1
If neck is side bending: +1

Neck Score

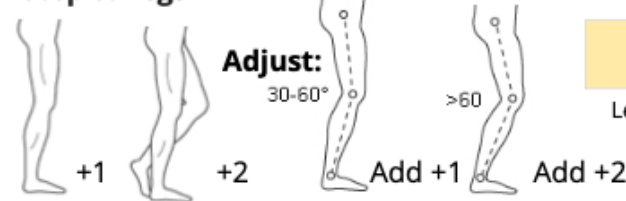
Step 2: Locate Trunk Position



Step 2a: Adjust...
If trunk is twisted: +1
If trunk is side bending: +1

Trunk Score

Step 3: Legs



Leg Score

Step 4: Look-up Posture Score in Table A

Using values from steps 1-3 above,
Locate score in Table A

Posture Score A

Step 5: Add Force/Load Score

If load < 11 lbs.: +0
If load 11 to 22 lbs.: +1
If load > 22 lbs.: +2

Adjust: If shock or rapid build up of force: add +1

Force / Load Score

Step 6: Score A, Find Row in Table C

Add values from steps 4 & 5 to obtain Score A.
Find Row in Table C.

Score A

Scoring

1 = Negligible Risk
2-3 = Low Risk. Change may be needed.
4-7 = Medium Risk. Further Investigate. Change Soon.
8-10 = High Risk. Investigate and Implement Change
11+ = Very High Risk. Implement Change

Scores

Table A	Neck												
		1				2				3			
	Legs	1	2	3	4	1	2	3	4	1	2	3	4
Trunk Posture Score	1	1	2	3	4	1	2	3	4	3	3	5	6
	2	2	3	4	5	3	4	5	6	4	5	6	7
	3	2	4	5	6	4	5	6	7	5	6	7	8
	4	3	5	6	7	5	6	7	8	6	7	8	9
	5	4	6	7	8	6	7	8	9	7	8	9	9

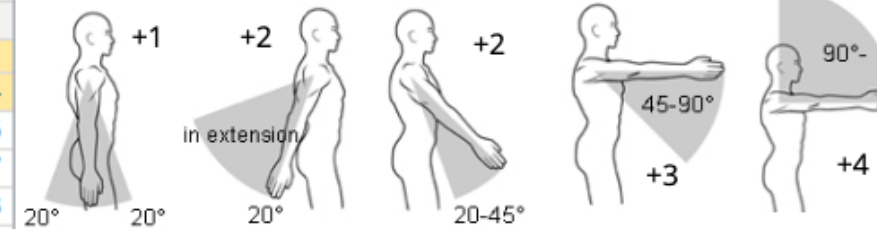
Table B	Lower Arm						
		1			2		
	Wrist	1	2	3	1	2	3
Upper Arm Score	1	1	2	2	1	2	3
	2	1	2	3	2	3	4
	3	3	4	5	4	5	5
	4	4	5	5	5	6	7
	5	6	7	8	7	8	8
	6	7	8	8	8	9	9

Score A	Table C											
	Score B											
	1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	2	3	3	4	5	6	7	7	7
2	1	2	2	3	4	4	5	6	6	7	7	8
3	2	3	3	3	4	5	6	7	7	8	8	8
4	3	4	4	4	5	6	7	8	8	9	9	9
5	4	4	4	5	6	7	8	8	9	9	9	9
6	6	6	6	7	8	8	9	9	10	10	10	10
7	7	7	7	8	9	9	9	10	10	11	11	11
8	8	8	8	9	10	10	10	10	10	11	11	11
9	9	9	9	10	10	10	11	11	11	12	12	12
10	10	10	10	11	11	11	11	12	12	12	12	12
11	11	11	11	11	12	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12	12	12	12	12	12

Table C Score + Activity Score = REBA Score

B. Arm and Wrist Analysis

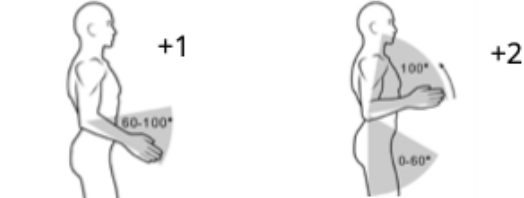
Step 7: Locate Upper Arm Position:



Step 7a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

Upper Arm Score

Step 8: Locate Lower Arm Position:



Lower Arm Score

Step 9: Locate Wrist Position:



Wrist Score

Step 9a: Adjust...
If wrist is bent from midline or twisted: Add +1

Step 10: Look-up Posture Score in Table B

Using values from steps 7-9 above, locate score in Table B

Posture Score B

Step 11: Add Coupling Score

Well fitting Handle and mid rang power grip, **good: +0**
Acceptable but not ideal hand hold or coupling
acceptable with another body part, **fair: +1**
Hand hold not acceptable but possible, **poor: +2**
No handles, awkward, unsafe with any body part,
Unacceptable: +3

Coupling Score

Step 12: Score B, Find Column in Table C

Add values from steps 10 & 11 to obtain
Score B. Find column in Table C and match with
Score A in row from step 6 to obtain Table C Score.

Score B

Step 13: Activity Score

+1 1 or more body parts are held for longer than 1 minute (static)
+1 Repeated small range actions (more than 4x per minute)
+1 Action causes rapid large range changes in postures or unstable base

Any Questions?



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Thank You

