



Learned Non-Use After Orthopedic Upper Extremity Injury or Surgery: A Cross-Sectional Study

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Introduction

- Individuals with upper extremity (UE) injuries are commonly immobilized for prolonged periods of time (Martin, 2024), which can lead to a multitude of negative effects.
- Learned non-use (LNU) is a phenomenon that occurs when the body decreases the use of an immobilized body part (Field-Fote, 2015).
- Individuals who are immobilized are at risk of developing LNU, however the incidence of this phenomenon in this population is still unexplored.
- Purpose:** to identify patterns of use of the injured UE in adults with orthopedic conditions who were immobilized.

Methods

- In this cross-sectional study, individuals were included if they were:
 - >18 years old
 - Immobilized for >2 weeks and out of immobilization for >2 weeks
 - Receiving outpatient therapy services
- The Motor Activity Log (MAL) was administered once to identify real-world use patterns of the affected UE.
- The MAL is a self-reported measure of how often and how well the affected arm is utilized to complete 30 daily tasks (Table 1).
 - Amount of Use (AOU) scale (0-5): 0 = Did not use my weaker arm, and 5 = Used my weaker arm as often as before the injury/surgery
 - How Well (HW) scale (0-5): 0 = The weaker arm was not used at all for this activity (never), and 5 = The ability to use the weaker arm for this activity was as good as before the injury/surgery

Table 1. Motor Activity Log (MAL) Activities and Scales

1. Turn on a light with a light switch	16. Take off your shoes
2. Open drawer	17. Get up from a chair with arm rest
3. Remove an item of clothing from a drawer	18. Pull chair away from table before sitting down
4. Pick up the phone	19. Pull chair toward table after sitting down
5. Wipe off kitchen counter or other surface	20. Pick up glass bottle or can
6. Get out of a car	21. Brush your teeth
7. Open the refrigerator	22. Put makeup, lotion or shaving cream on face
8. Open a door by turning a doorknob or handle	23. Use a key to unlock a door
9. Use a TV remote control	24. Write on paper
10. Wash your hands	25. Carry an object in your hand
11. Turn water on/off with a knob or lever on the faucet	26. Use a fork or spoon for eating
12. Dry your hands	27. Comb your hair
13. Put on your socks	28. Pick up a cup by the handle
14. Take off your socks	29. Button a shirt
15. Put on your shoes	30. Eat half a sandwich or finger foods

Methods cont.

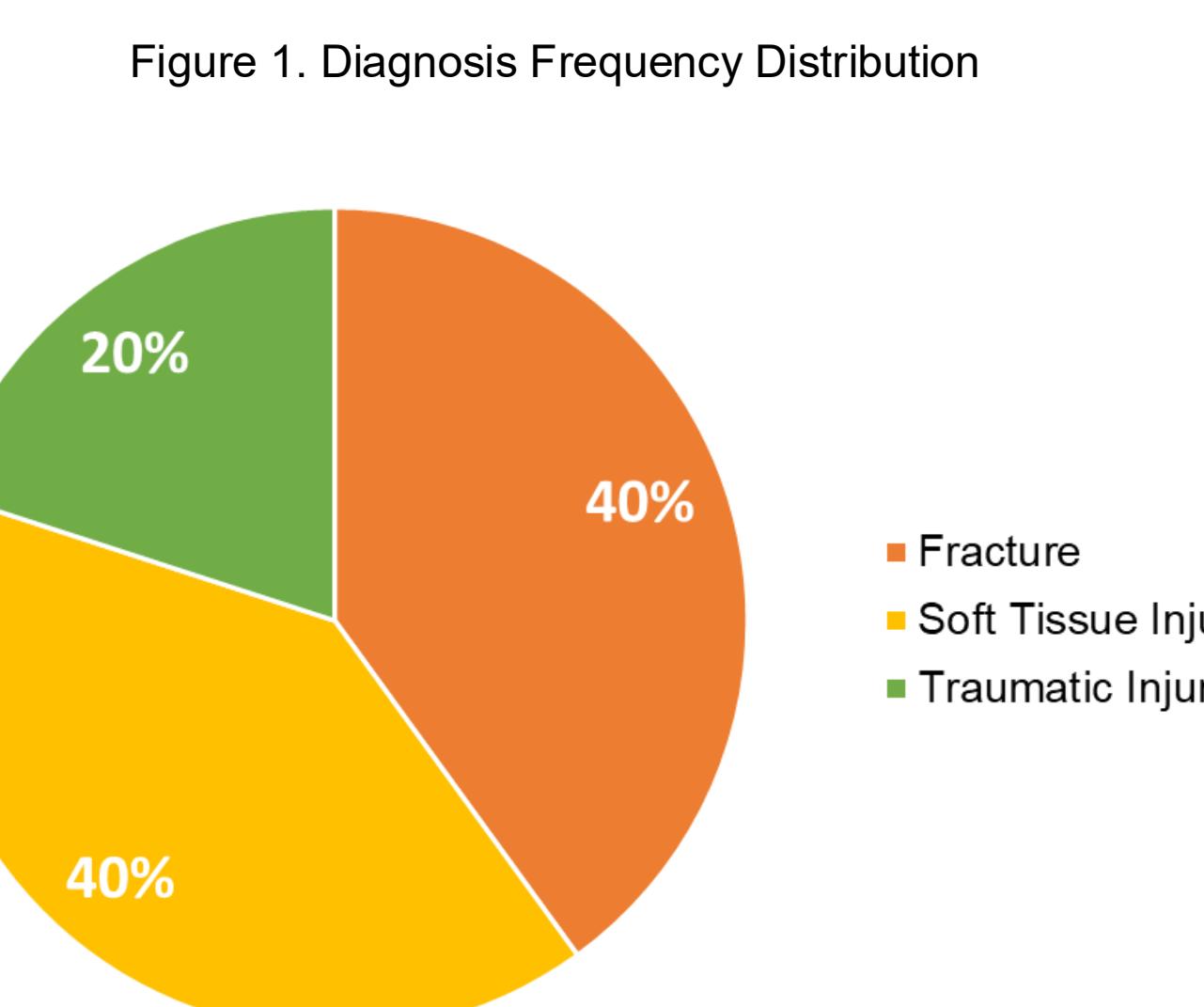
- Data analysis: MAL scores were descriptively analyzed by participant score and item score.
- Results are presented in mean, median, range, and frequency distribution (%).

Results

- Fifteen individuals were included, with a mean age of 50. Most were White (80%), and women (60%). Diagnoses included fractures (40%), soft tissue injuries (40%), and traumatic injuries (20%).
- The majority (60%) had been out of immobilization for ≤ 12 weeks, and 60% had injuries affecting their non-dominant hand.
- Demographic information presented in Table 2.

Table 2: Demographic Information

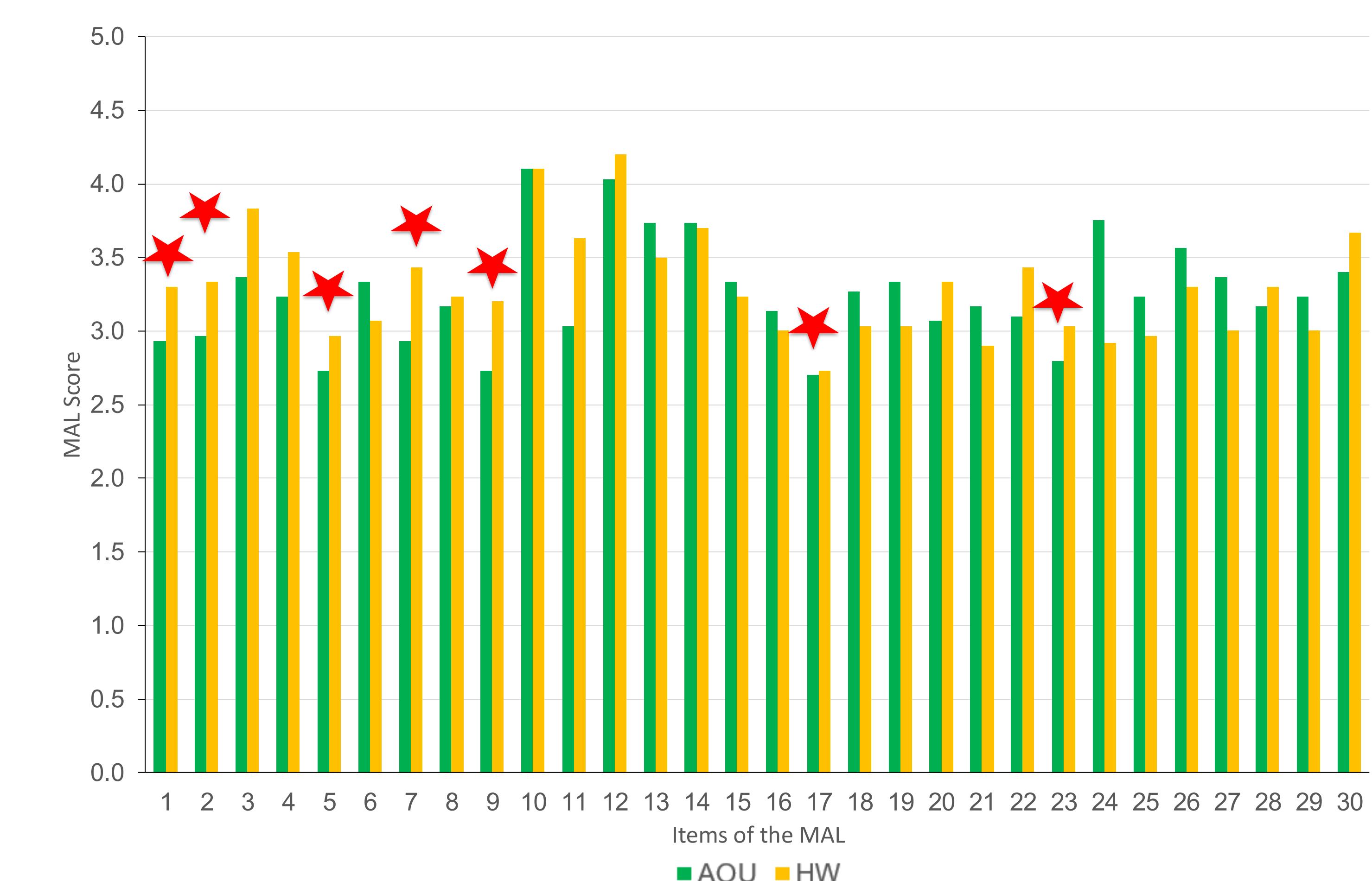
Characteristics	N=15
Age (Mean, range)	50 years, 24-74
Gender at Birth N(%)	
Female	9 (60%)
Male	6 (40%)
Ethnicity N(%)	
Hispanic	0
Non-Hispanic	15(100%)
Race N(%)	
White	12(80%)
Black	2 (13%)
Asian	1 (7%)
Time since immobilization (range)	2-104 weeks
Hand dominance N(%)	
Right	14 (93%)
Left	1 (7%)
Affected hand N(%)	
Right	5 (33%)
Left	10 (67%)
Dominant	6 (40%)
Non-Dominant	9 (60%)



Results cont.

- The median of the AOU was 3.4 (0.3-4.9), indicating that individuals used their affected UE about half as much as before the injury.
- The median HW score was also 3.4 (0.4-4.9) reflecting moderate effort during task performance.
- Tasks involving weight bearing, wrist extension, and dexterity, such as opening drawers, wiping counters, or using a TV remote, were rated 3 or lower on the AOU scale (Figure 3).

Figure 3. MAL Results per Item



Discussion/Conclusion

- Overall, the average use of the immobilized/affected extremity was about half of what the participants had before their injury, especially in activities that required dexterity, weight bearing, and wrist extension.
- The range in scores from the MAL reflect the variability in diagnoses and in the amount of time since immobilization means was removed.
- This study reflects the importance of using occupation-based assessments in outpatient orthopedic and hand therapy settings to frame intervention plans.

References

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