

UC Davis

Physical Medicine and Rehabilitation

Title

Efficacy of Hydrodilatation Protocol Treatment for Resolving Adhesive Capsulitis

Permalink

<https://escholarship.org/uc/item/9r74q6bv>

Authors

Ramos, Andres

Herman, Daniel C

Publication Date

2025-04-01

Data Availability

The data associated with this publication are not available for this reason: NA

Introduction

- Adhesive capsulitis, commonly known as frozen shoulder, is a condition characterized by pain and restricted range of motion (ROM)
- Hydrodilatation, in which a large volume of fluid is injected into the joint to stretch the capsule out and restore ROM, has emerged as a promising non-surgical intervention^{3,4}
- We currently lack information on prognostic factors for patient outcomes, such that providers may be unable to identify good candidates for this procedure and provide patients with appropriate expectations

Objective: evaluate the efficacy of a standardized hydrodilatation protocol in improving ROM and reducing pain while investigating patient-specific factors influencing outcomes

Design/Sample

- Prospective cohort study of 136 shoulders in 124 patients (M = 54, F = 70)
- Baseline assessments included ROM (forward flexion, abduction, and external rotation), Shoulder Pain and Disability Index (SPADI) scores, and patient-specific demographic and historical factors (Table 1)
- Hydrodilatation protocol (Table 2) was completed
- Post-procedure ROM and SPADI scores were compared using paired t-tests and linear regression analysis was used to identify predictors of SPADI and ROM improvements at two weeks follow-up (alpha = 0.05)

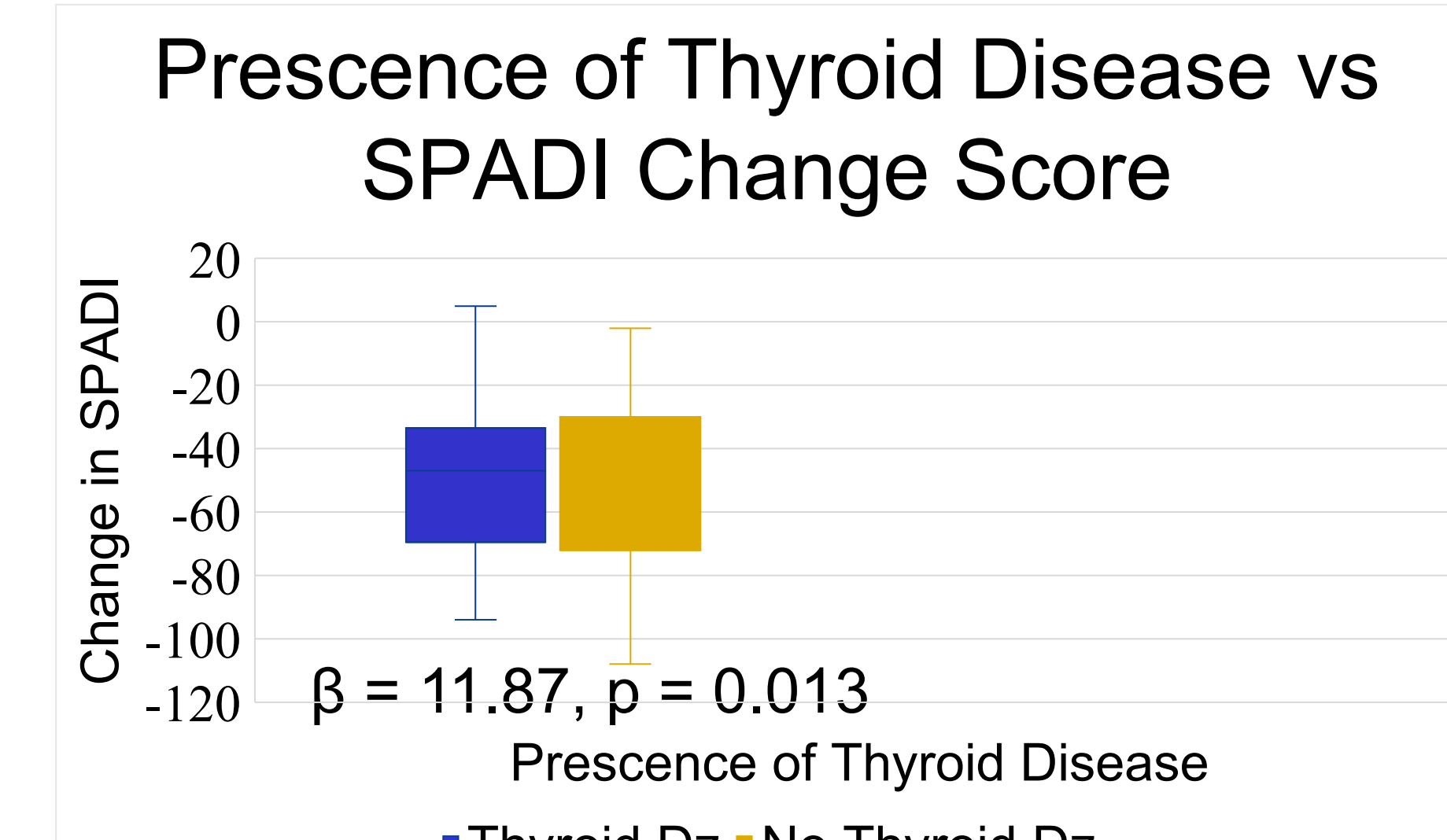
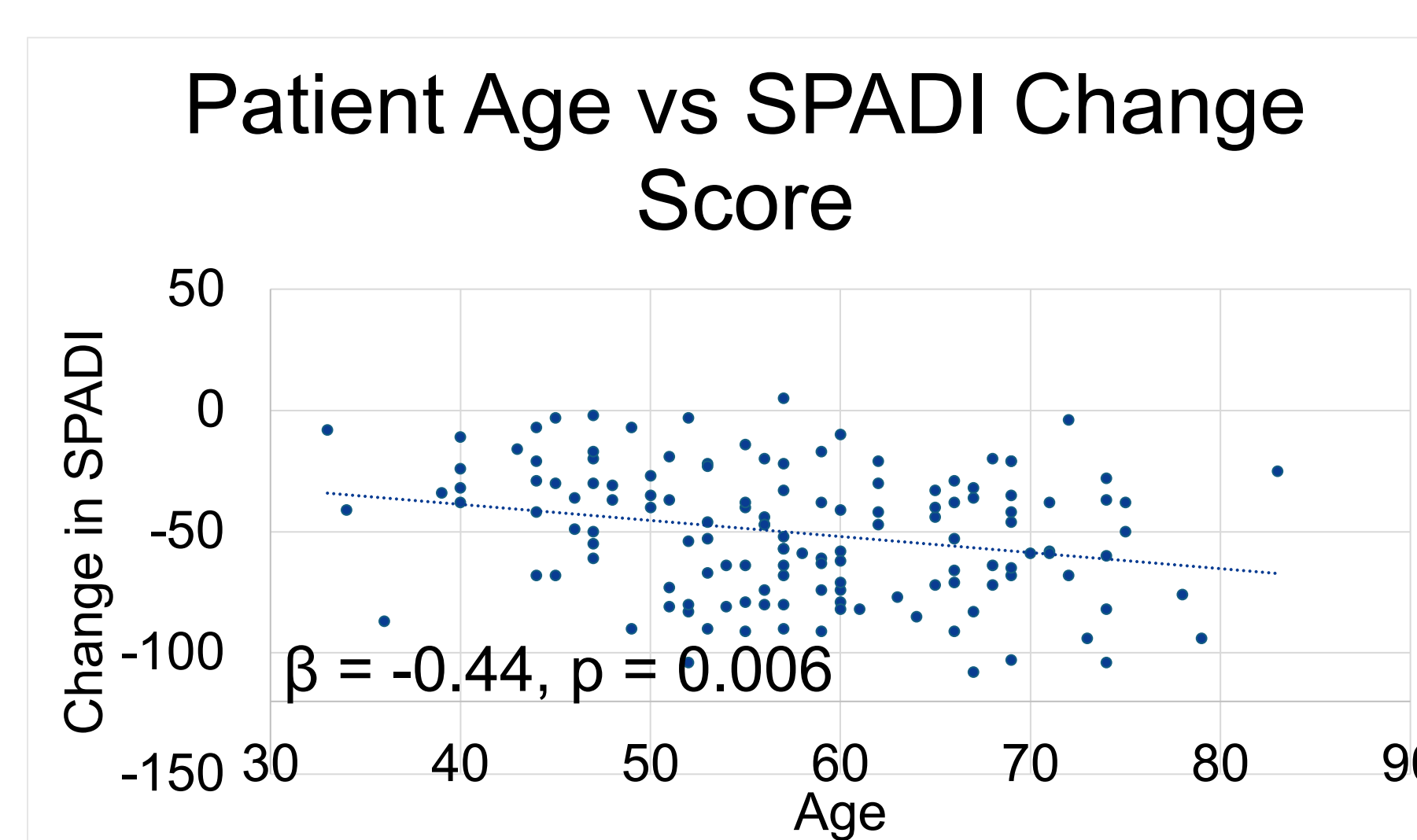
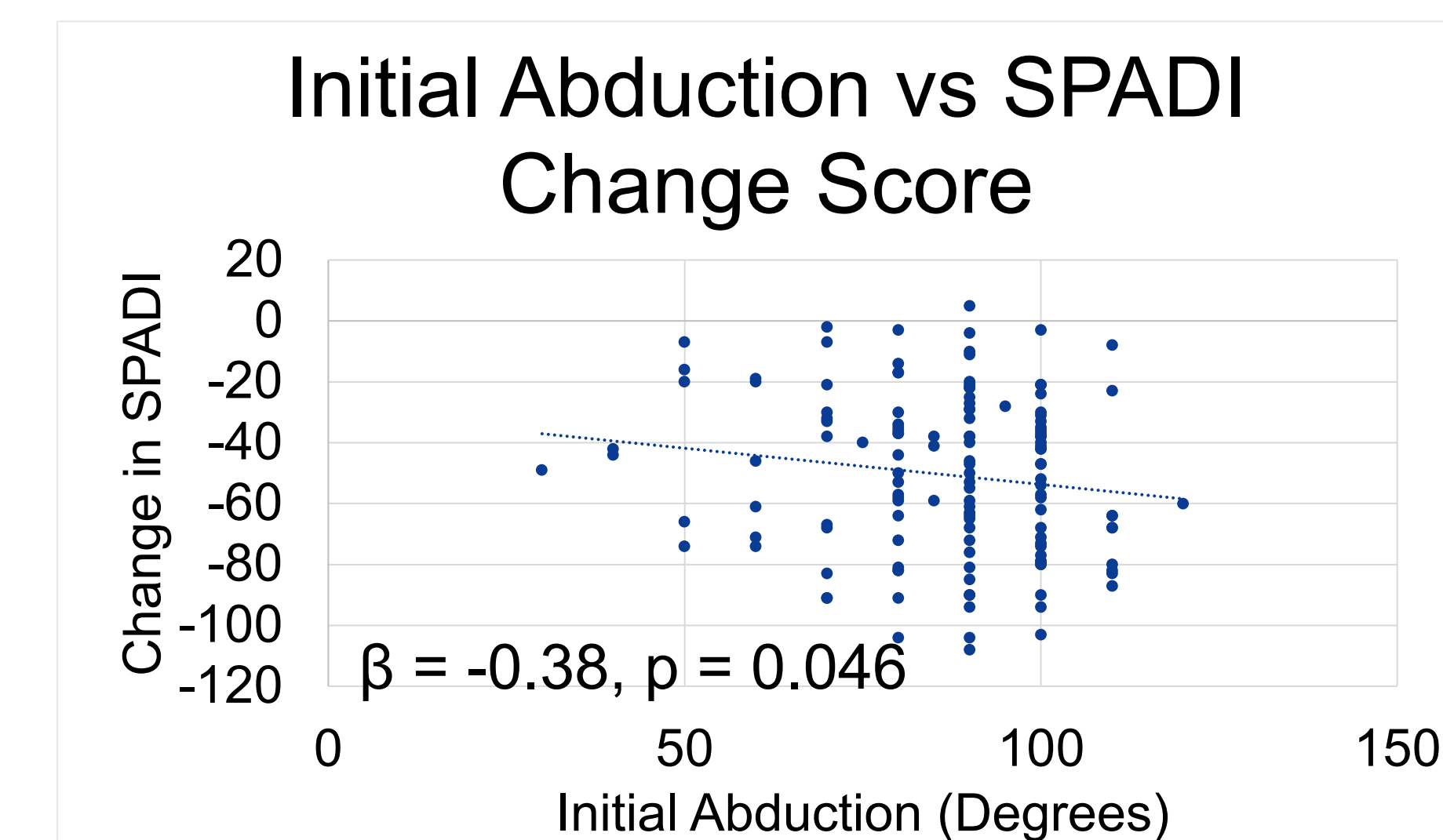
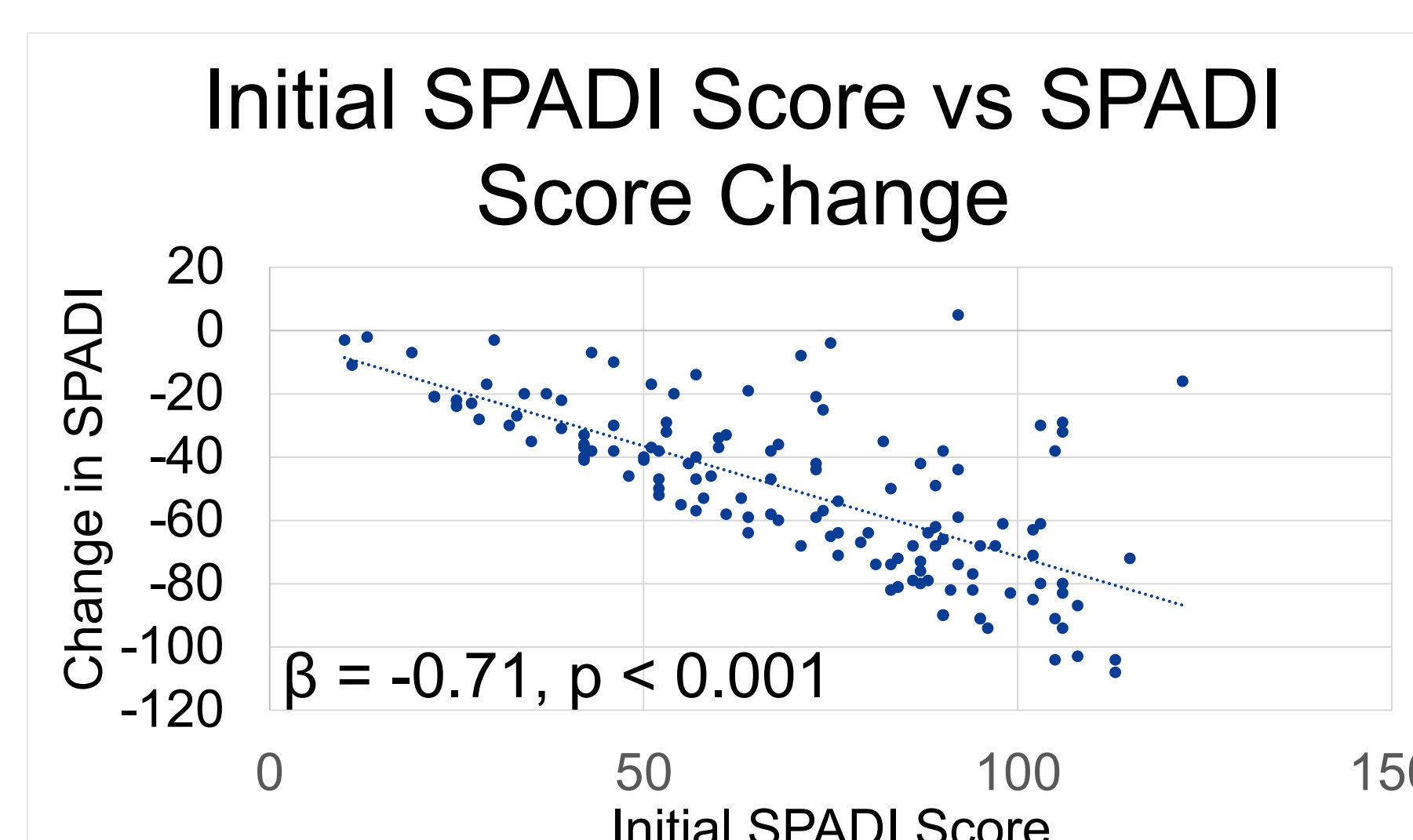
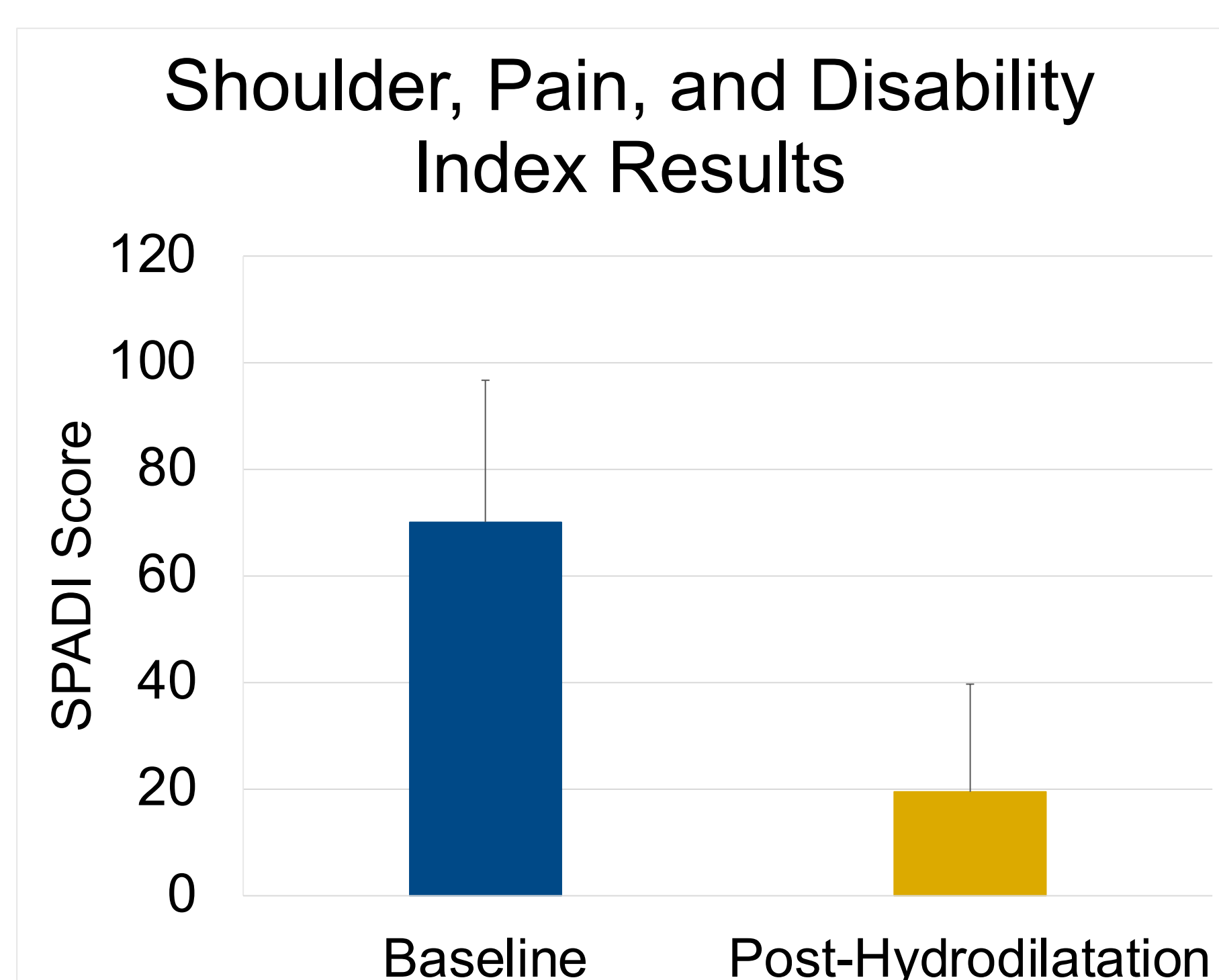
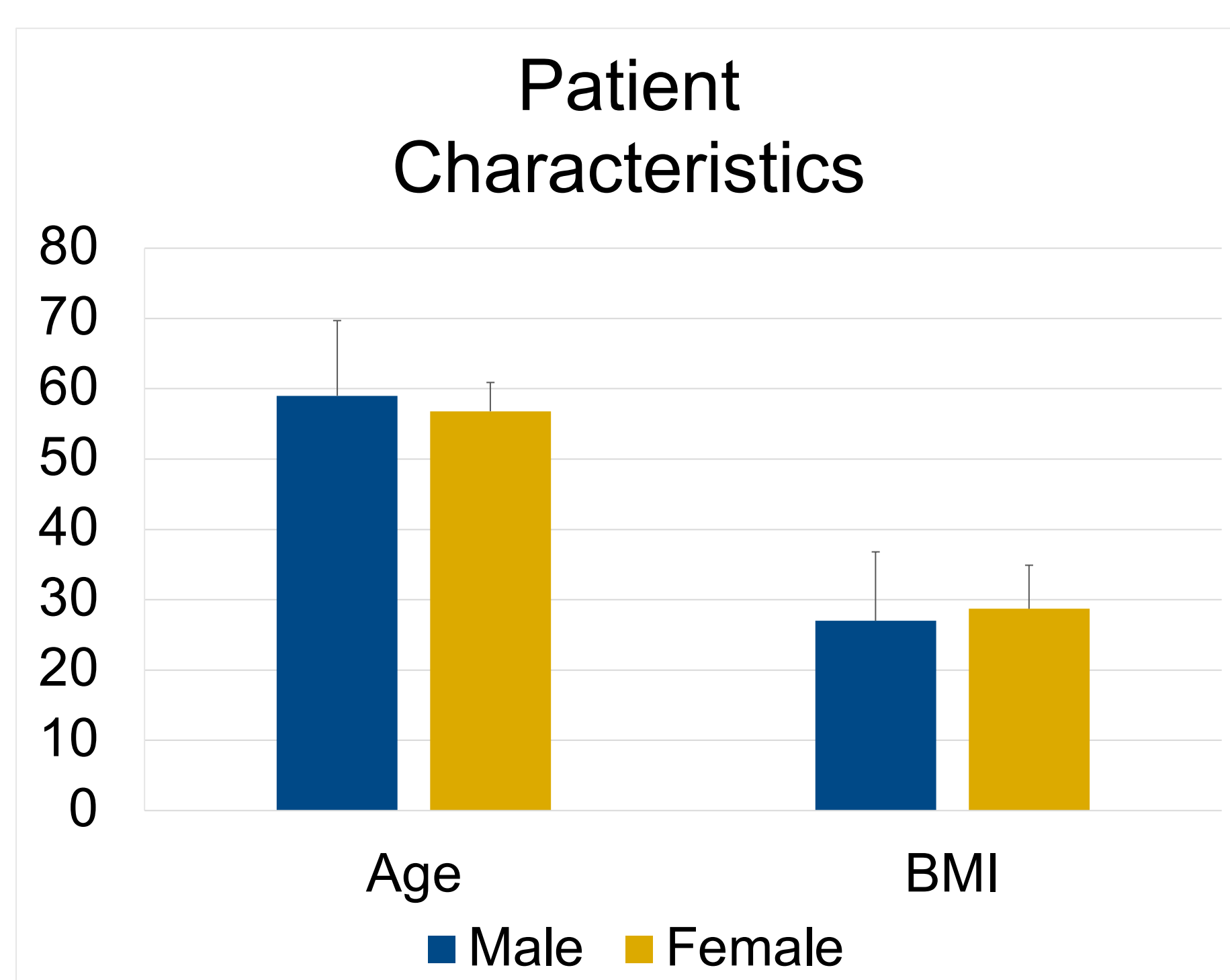
Category	Variables Collected
Demographics	Age, Height, Weight, BMI, Sex
MSK History	Acute Trauma History, History of Shoulder Surgery, Presence of Calcific Tendinopathy on Radiographs
Medical History	Diabetes, Hypothyroid Disease, Autoimmune Disorder Status, Cardiovascular Disease Status, Rheumatologic Disease Status, Smoking History

Table 1. Variables collected for analyses

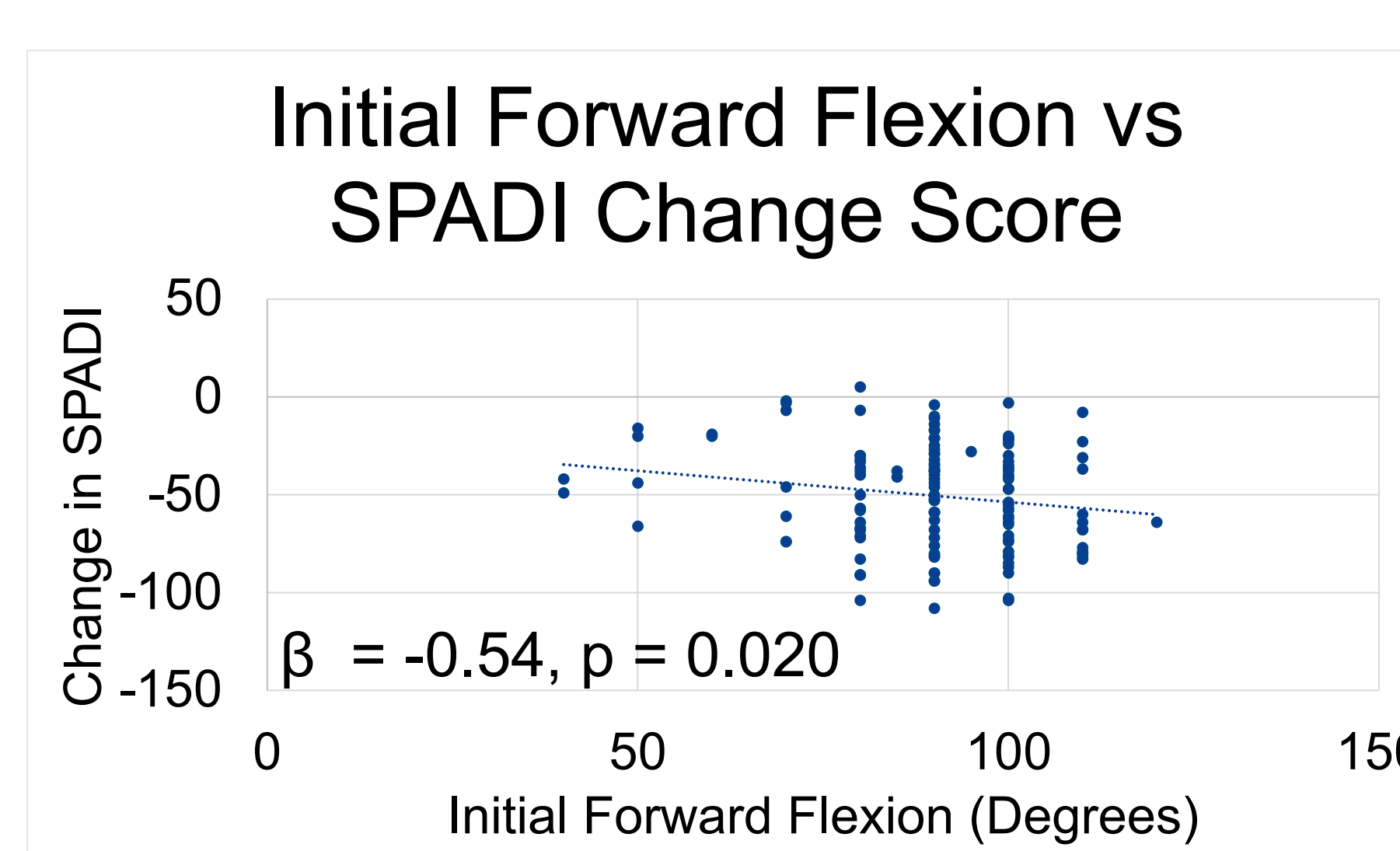
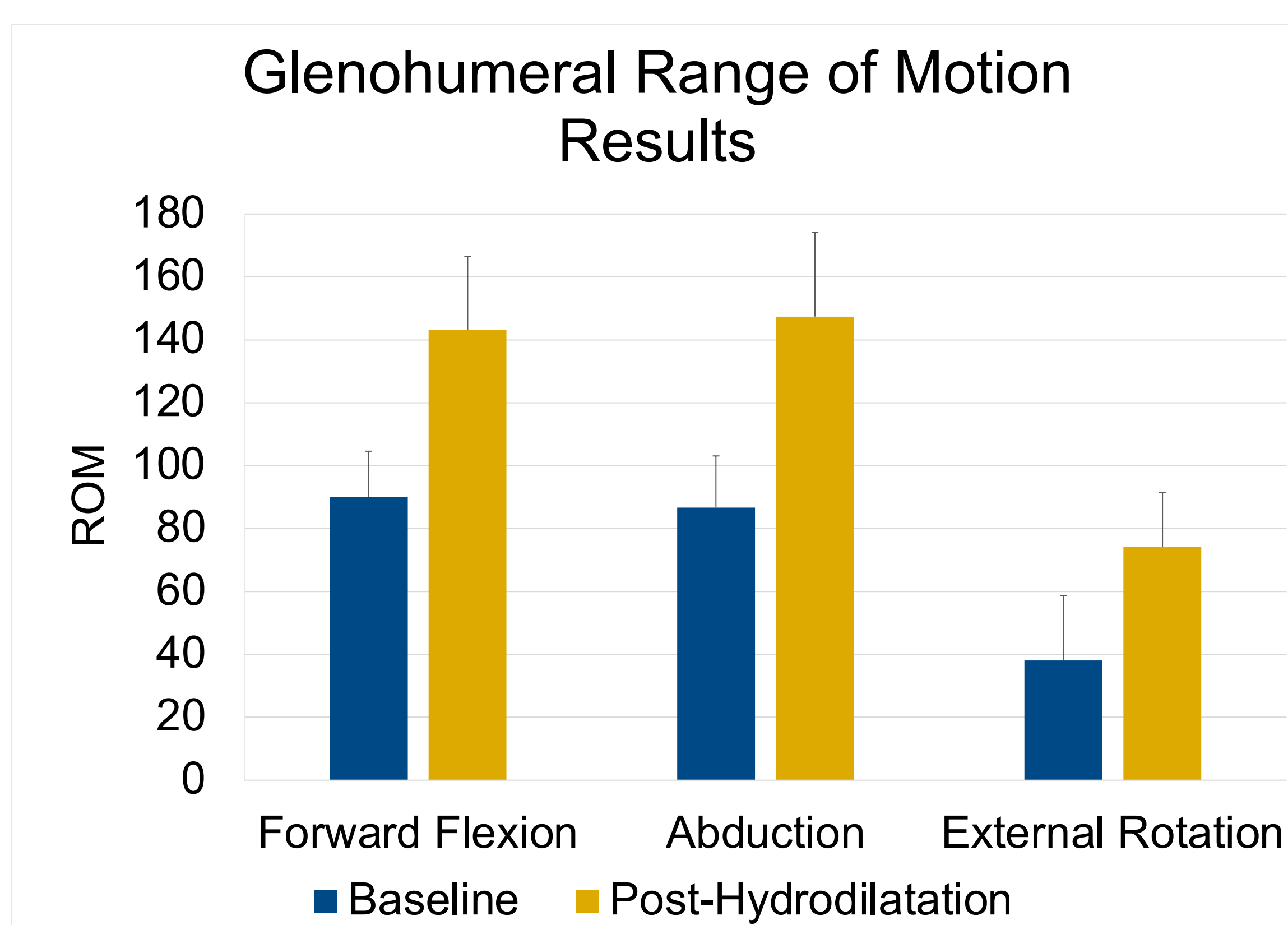
Steps	Protocol
Nerve Blocks	3mL 1% lidocaine at the lateral pectoral, subscapularis, sensory axillary, and suprascapular nerves under ultrasound guidance
Capsular Expansion	4mL 1% lidocaine, 1mL (40mg) triamcinolone, and up to 60mL of normal saline injected into the glenohumeral joint under ultrasound guidance
Brisement	Forceful ROM in forward flexion, abduction, and external rotation

Table 2. Hydrodilatation Protocol

Results



- Hydrodilatation significantly improved both shoulder ROM and function as measured by the SPADI
- Effect sizes were very large, including 1.9 for the SPADI and ranging from 2.7 to 3.4 for shoulder ROM.



- Linear regression was significant ($R^2=0.64$, $F=13.01$, $p<0.001$)
- Positive outcome predictors included: Baseline SPADI, Age, Baseline Forward Flexion ROM, Baseline Abduction ROM
- Hx of Thyroid Disease predicted worse outcomes

Summary

- Hydrodilatation significantly improves ROM and pain scores, with results far exceeding clinically meaningful thresholds
- Older age, higher initial SPADI scores, and better baseline ROM predict greater benefits, while thyroid disease may hinder results
- These results underscore the benefits of hydrodilatation for adhesive capsulitis and enhance providers' ability to counsel patients regarding potential outcomes on an individualized basis

References

- School of Medicine, University of California at Davis
- Department of Physical Medicine and Rehabilitation, University of California at Davis
- Lädermann A, et al. Hydrodilatation with corticosteroids is the most effective conservative management for frozen shoulder. PMID: 33420809
- Zhang J, et al. Comparative Efficacy and Patient-Specific Moderating Factors of Nonsurgical Treatment Strategies for Frozen Shoulder: An Updated Systematic Review and Network Meta-analysis. PMID: 32941053