Enlisted Status & Prior Mental Health Diagnosis Predict Baseline Pain Among Service Members Undergoing ACL Reconstruction: A MOTION Cohort Study

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Uniformed Services University

Andrew Sheean[1], Yuxuan Jin[2], Laura Withrow[3], Elizabeth Harris [4,5], Matthew Bradley[4,5], MOTION Collaborative, Kurt P. Spindler[2]

[1] University of Wisconsin–Madison, Madison, WI[2] Cleveland Clinic, Cleveland, OH[3] Vanderbilt University, Nashville, TN[4] The Geneva Foundation, Tacoma, WA [5] Uniformed Services University of the Health Sciences

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INTRODUCTION

Preoperative pain and dysfunction may predict worse postoperative outcomes following ACL reconstruction (ACLR). Using data from the Military Orthopaedic Tracking Injuries and Outcomes Network (MOTION), we evaluated demographic and injury-related predictors of baseline pain and knee function among Service Members undergoing primary ACLR.

Study Objective To identify demographic and injury-related factors associated with baseline pain and knee function in military Service Members undergoing primary ACLR.

Hypothesis: Female sex, enlisted status, smoking history, meniscal/chondral injury, and prior mental health diagnosis would predict greater pain and worse function before surgery.

METHODS

Study Population: Prospective MOTION cohort

Inclusion
- Primary ACL reconstruction
- Operative report available
- Baseline PROMs completed

Predictors Evaluated
- Age
- Sex
- Race
- Meniscal tear
- Smoking history
- Grade III/IV chondral injury
- Previous meniscus surgery
- Prior mental health diagnosis
- Military status (Officer vs Enlisted)

Primary Outcomes
- PROMIS Pain Interference (PROMIS-PI)
- IKDC

Multivariable regression analyses were performed using demographics, injury characteristics, and patient-reported outcome measures (PROMs).

RESULTS

606 Service Members undergoing primary ACL reconstruction (ACLR) were included in the final analysis

218 Officers (36.0%)
388 Enlisted (64.0%)

Table 1. MOTION Cohort Summary Statistics. For continuous variables, the summary statistics displayed are median [Q1, Q3]. For categorical variables, the summary statistics displayed are counts and percentages.

Variable	Level	Total (N=606)	N
Age		26.0 [22.0;33.0]	606
Sex	Female	163 (26.9%)	606
	Male	443 (73.1%)	
Previous Meniscus Surgery	No	591 (97.8%)	604
	Yes	13 (2.15%)	
Education	Enlisted	388 (64.0%)	606
	Officer	218 (36.0%)	
Smoking	No	507 (85.6%)	592
	Yes	85 (14.4%)	
Previous Mental Health Diagnosis	No	540 (89.6%)	603
	Yes	63 (10.4%)	
Chondral Injury	No	536 (88.4%)	606
	Yes	70 (11.6%)	
Meniscal Tear	No	235 (38.8%)	606
	Yes	371 (61.2%)	
Race	White	337 (55.6%)	606
	Black	89 (14.7%)	
	Other	180 (29.7%)	
PROMIS Pain Interference		57.3 [52.8;61.7]	542
PROMIS Physical Function		42.5 [38.7;45.9]	542
IKDC		50.6 [39.1;59.8]	605

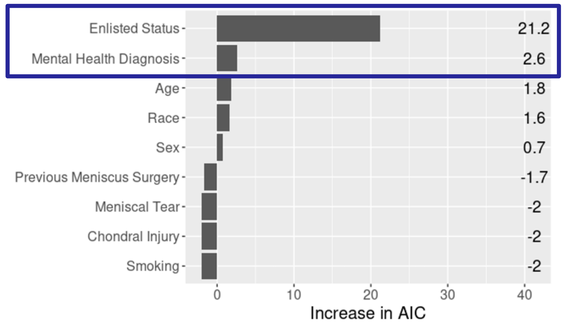

Figure 1. Results of Modeling for Baseline PROMIS Pain Interference

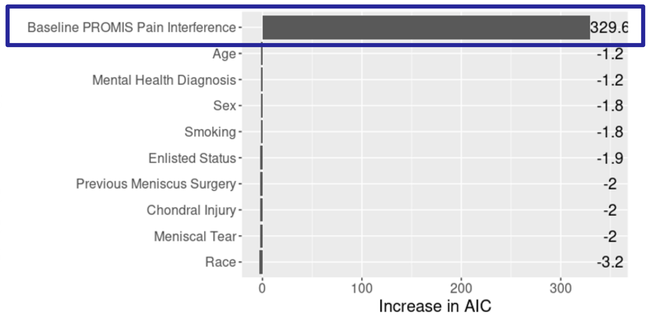

Figure 2. Results of Modeling for Baseline IKDC

Enlisted status was a significant predictor of greater baseline pain interference (PROMIS PI).

Key predictors of increased baseline pain interference included:
- Enlisted SM status (strongest predictor)
- History of mental health diagnosis

Baseline pain interference was significantly associated with baseline knee function (IKDC).
- Higher PROMIS PI scores (greater pain interference) were associated with **worse baseline IKDC scores**

CONCLUSIONS

- Enlisted military status and prior mental health diagnosis were the strongest predictors of increased baseline pain before ACLR, highlighting a potential need for targeted preoperative support and risk stratification in military ACLR populations
- Greater baseline pain was associated with worse knee-specific function
- Early identification of high-risk Service Members may support targeted perioperative interventions and improved rehabilitation outcomes

IMPACT

Findings may inform resource allocation strategies aimed at maintaining operational readiness and optimizing recovery after ACLR

Department of Orthopedics and Rehabilitation
UNIVERSITY OF WISCONSIN
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