Early Psychosocial Factors Predict Physical Function and Return to Work Status at a 2- Year Follow-Up After a Lower Extremity Fracture

Lucy C. Bowers, BS, PA-S, William Charlton, BS, Josh Van Wyngaarden, PT, DPT, PhD, Brian W. Noehren PT, PhD, Paul E. Matuszewski, MD

College of Medicine
Orthopedic Surgery and Sports Medicine

College of Health Sciences
Physician Assistant Studies

Introduction

- There are approximately 500,000-600,000 lower extremity fractures occurring within the United States each year.
- The cost of treating these lower extremity fractures (LEF) are expensive.
- In 2017, the Army estimated cost from a lower extremity fracture to be $116 million dollars.
- $92 million was due to limited/ lost duty status. This is 4x what was spent on direct medical care.
- Patients are constantly asking when they can return to work, however, there are not many tools to help clinicians answer these questions.
- It is challenging to prognosticate recovery, but emerging evidence is supporting the importance of psychosocial factors.
- Return to work (RTW) has yet to be reported.

Purpose

- Determine if early psychosocial screening predicted the ability to RTW and self-reported physical function 24- months after a LEF requiring surgical fixation

Methods

- Prospective Longitudinal Cohort Study
- At 6-weeks and 3-months post-injury:
  - Pain Catastrophizing Scale (PCS)
  - Pain Self-Efficacy Questionnaire (PSE)
  - Patient Reported Outcome Measurement Information System (PROMIS)
- At 24-months post injury:
  - Cincinnati Occupational Rating Scale (CORS)
  - PROMIS Physical Function
- Separate linear regression analyses were completed for each outcome
  - Each model: BMI, Age, smoking status, depression, Injury Severity Score, PSE, and PCS.

Results

Subject Demographics (n = 177)	
Characteristic	**Mean ± SD or (%)**
Age (y)	41.9 ± 14.5
Sex	Male: 54% Female: 46%
BMI (kg/m^2)	31.22 ± 8.84
Length of Hospital Stay (days)	3.5 ± 3.4
Race	White: 90% Non-white: 10%
Smoker	27%

- Fracture types: tibia (51%), femur (25%), pelvis/acetabulum (17%), ankle/foot (5%), and patella (2%).
- 45% had articular involvement.
- MVC were the most common mechanism (38%), followed by falls (29%).

Cincinnati Occupational Rating Scale at 24-months	
CORS Score	**N (%)**
Disabled (CORS=0)	4 (2.9)
Very Light Duty (CORS=1-20)	40 (29.4)
Light Duty (CORS=21-40)	45 (33.1)
Moderate (CORS=41-60)	32 (23.5)
Heavy (CORS=61-80)	11 (8.1)
Very Heavy (CORS >80	4 (2.9)

- 138 (78%) completed this study.
- At 24 months:
  - 15% increase in light duty only work.
  - 11% decrease in ability to return to heavy work.

PSE and BMI Predictive Value of CORS at 24-Months		
	6-weeks	3-months
Pain Self-Efficacy	b=0.357 95%CI: 0.154 to 0.560 **p=0.001**	b=0.355, 95%CI: 0.130 to 0.580 **p=0.002**
BMI	b=-0.683, 95%CI: -1.012 to -0.354 **p<0.001**	b=-0.732, 95%CI:-1.072 to -0.392 **p<0.001**

PSE and BMI Predictive Value of Physical Function at 24-Months		
	6-weeks	3-months
Pain Self-Efficacy	b=0.243 95%CI: 0.149 to 0.337 **p<0.001**	b=0.354 95%CI:0.263 to 0.446 **p<0.001**
BMI	b=-0.336 95%CI:-0.484 to -0.188 **p<0.001**	b=-0.318 95%CI: -0.459 to -0.178 **p<0.001**

Results Cont.

- Patients with a high BMI at baseline (greater than 30) reported:
  - Lower physical function at 24- months: -5.64pts (-11.4%)
  - Lower Occupational Rating Score: -16.2pts (-38.5%)
- Patients with low Pain Self-Efficacy score (Less than 40):
  - at 6-weeks
    - Lower physical function at 24mo: -6.42pts (-12.8%)
    - Lower Occupational Rating Score: -12.63pts (-30%)
  - At 3-months
    - Lower physical function at 24mo: -8.41pts (-16.8%)
    - Lower Occupational Rating Score: -12.39pts (-31.5%)

Conclusion

- Lower extremity fractures are common, disabling, and expensive.
- Most cost is from disability, NOT direct care.
- Our findings show two new tools to help identify patients most at risk for not making a complete recovery with a time to intervene:

Low Pain Self- Efficacy (<40 at 6 weeks or 3 months) OR High patient BMI at baseline (>30)

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Worse physical function and occupational status at 24 months

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