Determinants of Quality of Life at 12-Months following Anterior Cruciate Ligament Reconstruction in Young Athletes

Christina Y. Le PT, PhD Student\textsuperscript{1,2}, Catherine Hui MD\textsuperscript{2,3}, Carolyn A. Emery PT, PhD\textsuperscript{4}, Patricia J. Manns PT, PhD\textsuperscript{1}, Jackie L. Whittaker PT, PhD\textsuperscript{1}

\textsuperscript{1}Faculty of Rehabilitation Medicine, University of Alberta, Canada  
\textsuperscript{2}Glen Sather Sports Medicine Clinic, University of Alberta, Canada  
\textsuperscript{3}Division of Orthopedic Surgery, Department of Surgery, University of Alberta, Canada  
\textsuperscript{4}Sport Injury Prevention Research Centre, Faculty of Kinesiology, University of Calgary

Corresponding Author: Christina Y. Le \texttt{cyle@ualberta.ca}  
Tweet: @yegphysio
Consequences of an Anterior Cruciate Ligament Injury

Background & Objectives

- Anterior cruciate ligament (ACL) tear is a common injury sustained by young athletes.

- Long-term consequences of an ACL tear include:
  - ↓ Quality of life (QOL)
  - ↓ Physical activity
  - ↑ Risk of being overweight or obese
  - ↑ Risk of osteoarthritis

- There is little information regarding what modifiable factors impact knee-related QOL following youth sport-related ACL reconstruction (ACLR).

- Identifying these factors can inform interventions that improve QOL.

To examine association of 6-month self-reported knee symptoms, kinesiophobia (fear of movement and reinjury), and daily average moderate-to-vigorous physical activity (MVPA), with 12-month knee-related QOL following ACLR in young athletes.

Shaw & Finch (2017); Toomey et al. (2017); Whittaker et al. (2017)
Study Sample
20 youth (15-20 years old) with a first-time, sport-related ACL tear who elected to undergo ACLR were recruited from a university-based sports medicine clinic.

Exposure Variables
- Knee Injury and Osteoarthritis Outcome Score knee symptoms subscale (KOOS\textsubscript{SX})
- Tampa Scale for Kinesiophobia (TSK)
- Daily average minutes of MVPA (ActiGraph GT3X)

Outcome Variable
Knee Injury and Osteoarthritis Outcome Score knee-related QOL subscale (KOOS\textsubscript{QOL})

Statistical Analyses:
- Descriptive statistics [mean (95%CI), median (range), or proportion (exact 95%CI)] were calculated for demographic outcome and exposure variables
- Univariable linear regression was used to evaluate the associations between each 6-month exposure variable and 12-month KOOS\textsubscript{QOL} (95%CI; \(\alpha=0.05\))
## Changes in QOL and Possible Determinants of QOL

### Results

#### Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic*</th>
<th>Summary Statistics</th>
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<tbody>
<tr>
<td><strong>Sex (% female)</strong></td>
<td>70 (45, 87)</td>
</tr>
<tr>
<td><strong>Age at baseline (years; mean±SD, 95%CI)</strong></td>
<td>18.1±1.8 (15.1, 20.5)</td>
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<tr>
<td><strong>Injury mechanism (% non-contact)</strong></td>
<td>65 (40, 84)</td>
</tr>
<tr>
<td><strong>Concomitant meniscus injury (% yes)</strong></td>
<td>85 (60, 96)</td>
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<tr>
<td><strong>Main sport (% soccer)</strong></td>
<td>40 (20, 64)</td>
</tr>
<tr>
<td><strong>Main sport participation level (% club)</strong></td>
<td>25 (10, 50)</td>
</tr>
<tr>
<td><strong>Time from injury to baseline (days; median, range)</strong></td>
<td>165 (78-1178)</td>
</tr>
<tr>
<td><strong>Time from baseline to ACLR (days; median, range)</strong></td>
<td>70 (1-219)</td>
</tr>
</tbody>
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*Values represent proportion and exact 95%CI unless otherwise noted

#### Change in KOOS\textsubscript{QOL} Score over Study Period

<table>
<thead>
<tr>
<th>KOOS\textsubscript{QOL} Score (0-100)</th>
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<tbody>
<tr>
<td>100</td>
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<tr>
<td>80</td>
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<tr>
<td>60</td>
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<tr>
<td>40</td>
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<tr>
<td>20</td>
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<td>0</td>
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- **Baseline**
- **3-Month**
- **6-Month**
- **9-Month**
- **12-Month**

#### Associations between 6-Month Exposure Variables and 12-Month KOOS\textsubscript{QOL} Score

- **6-Month KOOS\textsubscript{QOL}**: 1 unit
- **12-Month KOOS\textsubscript{QOL}**: 1.3 unit (95%CI 0.4, 2.1)
- **6-Month TSK**: 1 unit
- **12-Month KOOS\textsubscript{QOL}**: 3.3 unit (95%CI 0.6, 6.1)

No association was found between 6-month MVPA and 12-month KOOS\textsubscript{QOL}

Salavati et al. (2011)
Take Home Messages

Discussion

- 15 participants exceeded the KOOS\textsubscript{QOL} MCID over the 12-months
- 6-month KOOS\textsubscript{SX} was positively associated with 12-month KOOS\textsubscript{QOL}
  - Less swelling, stiffness, locking, catching was related to better QOL
- 6-month TSK was negatively associated with 12-month KOOS\textsubscript{QOL}
  - Less fear of movement and re-injury was related to better QOL
- No association was found between 6-month MVPA and 12-month KOOS\textsubscript{QOL}
  - May be due to a small sample size or non-representative physical activity data

There is preliminary evidence that fewer knee symptoms and less kinesiophobia at 6-months is associated with better knee-related QOL at 12-months post-ACLR.

Treatment efforts to minimize knee symptoms and kinesiophobia by 6-months may improve QOL at 12-month post-ACLR in young athletes.

Interpret these findings with caution due to small sample size and loss to follow-up.

More research is needed to understand modifiable determinants of QOL following sport-related ACLR in young athletes.

Funding acknowledgements