Anterior Cruciate Ligament (ACL) Injury Mechanism and the Perceived Pain Levels and Kinesiophobia of Female Athletes

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1 INTRODUCTION

Female athletes are most at-risk for injuries of the anterior cruciate ligament (ACL), particularly from non-contact change-of-direction movements that may incur concomitant injuries (e.g., medial collateral ligament, meniscus). Furthermore, ACL injuries tend to occur in female athletes' supporting leg during twisting or turning movements. Nonetheless, pain associated with ACL injuries is multidimensional involving physical sensations and psychological responses. Although the intensity of pain sensations should diminish during injury recovery, subjective experiences of pain may lead to feelings of uncertainty, doubt, and movement-related fears or kinesiophobia.

2 PURPOSE

The purpose of this study was to examine the perceived pain levels and kinesiophobia of female athletes based on ACL injury mechanism.

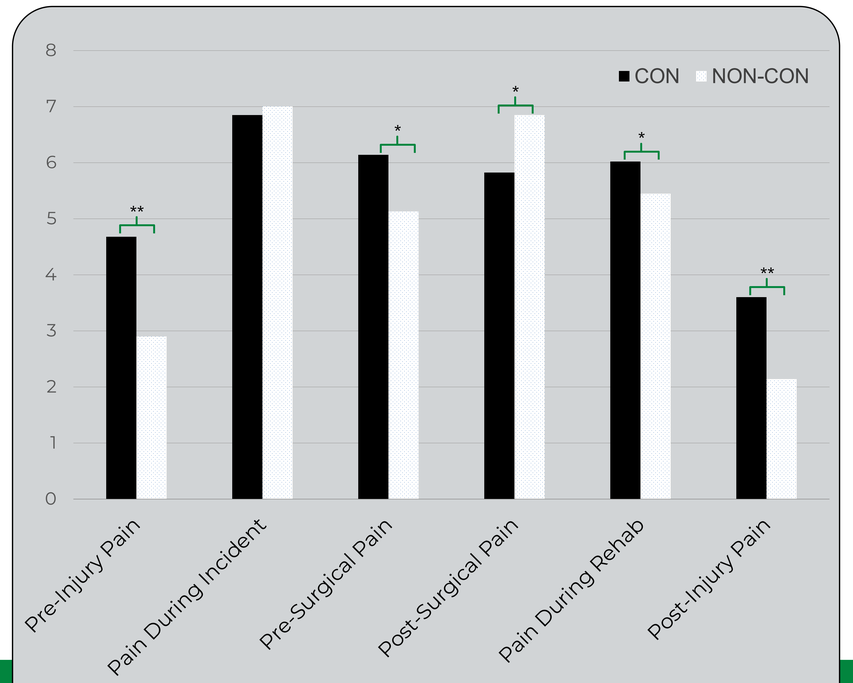
3 METHODS

Female athletes (N = 176) who had experienced an ACL injury were recruited to complete an online survey involving measures of kinesiophobia (Tampa Scale of Kinesiophobia-13), perceived pain levels at various timepoints (e.g., during injury incident, during rehabilitation), and demographic information (e.g., injury mechanism, concomitant injuries, injury site). Based on participants' responses of ACL injury mechanism, they were categorized into contact (CON; n = 125) and non-contact groups (NON-CON; n = 51) before independent samples t-tests were conducted.

4 RESULTS

Post-ACL female athletes of the NON-CON group most often injured their non-dominant leg, while the CON group more commonly injured their dominant leg and experienced concomitant injuries. The comparison of kinesiophobia scores show a significant difference between groups, with NON-CON athletes reporting higher injury-related fears than CON athletes. Results also indicate that throughout the injury recovery process (i.e., pre-surgery, post-surgery, during rehabilitation), the CON athletes reported higher pain levels than the NON-CON athletes.

FIGURE 1. Perceived Pain Levels of Contact and Non-Contact Groups Throughout ACL Injury Process



Note. N = 176; n_{CON} = 125; $n_{NON\text{-}CON}$ = 51; * $p < 0.05$ ** $p < 0.01$; CON = Contact injury mechanism; NON-CON = Non-contact injury mechanism; $n_{SURGICAL}$ = 132; $n_{NON\text{-}SURGICAL}$ = 44; perceived pain scales were measured on a 0-10 scale, with 0 indicating no pain and 10 indicating the most pain.

TABLE 1. Results of T-Test Comparing Contact and Non-Contact Groups

VARIABLE	GROUP	*n*	*M*	*SD*	*df*	*T*	*p*
ACL Injury Side	CON	125	1.06	1.11	174	-2.82	< 0.01
	NON-CON	51	1.61	1.33			
Concomitant Injury	CON	125	0.83	0.38	174	2.72	< 0.01
	NON-CON	51	0.65	0.48			
Overall Pain Levels	CON	125	4.86	3.07	174	3.17	< 0.01
	NON-CON	51	4.45	3.21			
Kinesiophobia	CON	125	28.24	6.81	174	2.52	< 0.01
	NON-CON	51	28.96	6.48			
Fear of Pain	CON	125	10.68	2.75	174	1.67	< 0.01
	NON-CON	51	10.77	2.55			
Somatic Focus	CON	125	9.77	2.76	174	2.22	< 0.05
	NON-CON	51	10.08	2.82			
Fear of Reinjury	CON	125	7.79	2.15	174	2.91	< 0.05
	NON-CON	51	8.10	2.12			
Return-to-Sport	CON	125	0.18	0.38	174	-0.01	0.49
	NON-CON	51	0.18	0.39			

Note. N = 176; CON = Contact injury mechanism; NON-CON = Non-contact injury mechanism.

5 SUMMARY & CONCLUSION

Although female athletes who experience non-contact ACL injuries are likely do to so on their non-dominant leg, their perceived pain levels and risk for concomitant injuries are lower than those who injure from contact mechanisms. However, non-contact ACL injuries led to increased fears of movement, pain, and reinjury. Considering this, sports professionals may want to tailor injury recovery programs for female athletes based on injury mechanism and collaborate with a sport psychology professional to highlight pain management strategies for both physical and psychological recovery outcomes.

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