

Appendix A

Medline search strategy

01. athletes/
02. injur\$.mp.
03. “wounds and injuries”/
04. 1 or 2 or 3
05. psychological models/
06. health knowledge attitudes, practice/ or attitude to health
07. illness belief.mp.
08. recovery expectation\$.mp
09. internal-external control/ or health locus of control.mp.
10. psychological tests
11. anxiety/
12. depression/
13. self efficacy/
14. fear/
15. motivation/
16. “fear of re-injury”.mp.
17. “fear for re-injury”.mp.
18. adaptation, psychological
19. 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18
20. “return to sport”.mp.
21. sport competition
22. “return to play”.mp.
23. “sport re-entry”.mp
24. 20 or 21 or 22 or 23
25. 4 and 19 and 24

Appendix B

Assessment of risk of bias items[10]

Inclusion criteria are defined

Exclusion criteria are defined

Source population is defined

Adequate description of diagnostic criteria for classifying patients as injured athletes

Clinical and demographic characteristics are fully described

The sample is representative of the majority of patients with an athletic injury

The sample is assembled at a common point following injury

The sample is complete

Any treatment received is fully described (including no treatment)

Outcome measures with established test-retest reliability in an athletic population have been used

Those assessing outcome were blinded to baseline data

Prognostic factors are fully defined, including details of method of measurements

Measurements used for the prognostic factors are standardised or validated

Was the sample size adequate for the number of prognostic factors included in the analysis? (minimum of 10 per factor)

Loss to follow up is less than 20%

Was multivariate analysis carried out?

Statistical adjustment for important prognostic factors (including age, sex)

**Note* Items are scored as satisfactory (1 point) or unsatisfactory (0 points)

Appendix C

Reason for exclusion	Reference
No quantitative psychological variable reported (n = 5)	Joy EA. Overcoming the odds. <i>Curr Sport Med Rep</i> 2007 6 :379-380. Kjeldsen SR, Tordrup PJ et al. Return to sport after a Bankart operation of the shoulder using the Mitek anchor system. <i>Am J Sport Med</i> 1996 6 :346-351. Makdissi M, McCrory P, et al. A prospective study of postconcussive outcomes after return to play in Australian football. <i>Am J Sport Med</i> 2009 37 :877-883. Makdissi M, Darby D, et al. Natural history of concussion in Sport: Markers of severity and implications for management. <i>Am J Sport Med</i> 2010 38 :464-471. Podlog L, Eklund RC. A longitudinal investigation of competitive athletes' return to sport following serious injury. <i>J Appl Sport Psychol</i> 2006 18 : 44-68.
No return to sport rate reported (n = 11)	Duda J, Smart A, et al. Predictors of adherence in the rehabilitation of athletic injuries: An application of personal investment theory. <i>J Sport Psychol</i> 1989 11 :367-381. Evans L, Hardy L. Injury rehabilitation: A goal-setting intervention study. <i>Res Q Exerc Sport</i> 2010 73 :310-319. Hansen SJ, McCullagh P, et al. The relationship of personality characteristics, life stress, and coping resources to athletic injury. <i>J Sport Exerc Psychol</i> 1992 14 :262-272. Mainwaring L. Restoration of self: A model for the psychological response of athletes to severe knee injuries. <i>Can J Rehabil</i> 1999 12 :143-154. Morrey MA, Stuart MJ, Smith AM, et al. A longitudinal examination of athletes' emotional and cognitive responses to anterior cruciate ligament injury. <i>Clin J Sport Med</i> 1999 9 :63-69. Quinn AM, Fallon BJ. Predictors of recovery time. <i>J Sport Rehabil</i> 2000 9 :62-76. Thoméé P, Währborg P, et al. A randomized, controlled study of a rehabilitation model to improve knee function self-efficacy with ACL injury. <i>J Sport Rehabil</i> 2010 19 :200-213. Thoméé P, Währborg P, et al. Self-efficacy of knee function as a pre-operative predictor of outcome 1 year after anterior cruciate ligament reconstruction. <i>Knee Surg Sports Traumatol Arthrosc</i> 2008 16 :118-127. Thoméé P, Währborg P, et al. Self-efficacy, symptoms and physical activity in patients with an anterior cruciate ligament injury: A prospective study. <i>Scand J Med Sci Sports</i> 2007 17 :238-245. Thoméé P, Währborg P, et al. A new instrument for measuring self-efficacy in patients with an anterior cruciate ligament injury. <i>Scand J Med Sci Sports</i> 2006 16 :181-187. Walker N, Thatcher J, et al. A preliminary development of the Re-Injury Anxiety Inventory (RIAI). <i>Phys Ther Sport</i> 2010

11:23-29.

Not athletic injuries (n = 5)

- Bianco T, Malo S, Orlick T. Sport injury and illness: Elite skiers describe their experiences. *Res Q Exerc Sport* 1999 **70**:157-169.
- Gagnon I, Swaine B, et al. Exploring children's self-efficacy related to physical activity performance after a mild traumatic brain injury. *J Head Trauma Rehabil* 2005 **20**:436-449.
- Gordon S, Milios D, et al. Psychological aspects of the recovery process from sport injury: The perspective of sport physiotherapists. *Aust J Sci Med Sport* 1991 **23**:53-60.
- Gravare-Silbernagle K, Brorsson A, et al. The majority of patients with Achilles tendinopathy recover fully when treated with exercise alone. *Am J Sport Med* 2011 **39**: 607-613.
- Lamba H, Crossman J. The knowledge of, attitude toward and use of psychological strategies by physiotherapists in injury rehabilitation. *Phys Ther Sport* 1997 **20**: 14-17.

Review articles (n = 5)

- Brand E, Nyland J. Patient outcomes following anterior cruciate ligament reconstruction: The influence of psychological factors. *Orthopedics* 2009 **32**:335-340.
- Myklebust G, Bahr R. Return to play guidelines after anterior cruciate ligament surgery. *Br J Sport Med* 2005 **39**:127-131.
- Podlog L, Eklund RC. The psychosocial aspects of a return to sport following serious injury: A review of the literature from a self-determination perspective. *Psychol Sport Exerc* 2007 **8**:535-566.
- Podlog L, Dimmock J, Miller J. A review of return to sport concerns following injury rehabilitation: Practitioner strategies for enhancing recovery outcomes. *Phys Ther Sport* 2011 **12**:36-42.
- Yukelson D. Psychology of sports and the injured athlete. In: Bernhart DB, editor. *Clinics in Physical Therapy*. New York: Churchill-Livingston; 1986.

No separate analysis of returned to sport and not returned to sport (n = 6)

- Appaneal R, Levine B, Perna F, Roh J. Measuring postinjury depression among male and female competitive athletes. *J Sport Exerc Psychol* 2009 **31**:60-76.
- Cantu R, Guskiewicz K, et al. A retrospective clinical analysis of moderate to severe athletic concussions. *PM and R* 2010 **2**:1088-1093.
- Johnston LH, Carroll D. The context of emotional responses to athletic injury: A qualitative analysis. *J Sport Rehabil* 1998 **7**:206-220.
- Kvist J, Ek A, Sporrsteadt K, Good L. Fear of re-injury: A hindrance for returning to sports after anterior cruciate ligament reconstruction. *Knee Surg Sport Traumatol Arthrosc* 2005 **13**:393-397.
- Lee DY, Karim SA, et al. Return to sports after anterior cruciate ligament reconstruction: A review of patients with minimum 5-year follow-up. *Ann Acad Med Singapore* 2008 **37**:273-278.
- Tripp DA, Stanish W, et al. Fear of reinjury, negative affect, and catastrophizing predicting return to sport in recreational athletes with anterior cruciate ligament injuries at 1 year postsurgery. *Rehabil Psychol* 2007 **52**:74-81.

Case report (n = 2)

Jevon SM, O'Donovan SM. Psychological support delivery through the primary care provider in a sports medicine clinic: A case study of a British Championship motorcycle racer. *Phys Ther Sport* 2000; **1**: 85-90.

Pain M, Kerr JH. Extreme risk taker who wants to continue taking part in high risk sports after serious injury. *Br J Sport Med* 2004 **38**: 337-339.

Appendix D.

Autonomy-related psychological factors and outcome scales

Study	Psychological factor	Psychological outcome scale	Scale measurement properties	Scale psychometric properties
Gobbi & Francisco[25]	Motivation	Psychovitality questionnaire	Maximum 18 points; higher score indicates greater motivation	Not reported
Podlog et al.[21]	Motivation Perceived psychological return to sport outcomes	Adapted Sport Motivation Scale (SMS) Return to Sport After Serious Injury Questionnaire (RSSIQ)	SMS: 28-item questionnaire with score expressed as five subscales concerning intrinsic and extrinsic motivation RSSIQ: 21 item questionnaire with score expressed as two constructs – return concerns (RC) and renewed perspective (RP); higher RC score indicates more negative psychological return to sport outcome, higher RP score indicates more positive psychological return to sport outcome	SMS: Cronbach's $\alpha \geq 0.70$; test re-test reliability ICC range 0.63-0.85 RSSIQ: Cronbach's $\alpha = 0.83$
Smith et al.[30]	Self-esteem	Rosenberg Self-Esteem Inventory	10-item scale measuring global self-esteem; higher score indicates higher self-esteem	Cronbach's $\alpha \geq 0.85$; test re-test reliability ICC 0.84 in Spanish University students[31]
Podlog et al.[20]	Autonomy needs satisfaction Well-being Perceived psychological return to sport outcomes	Needs Satisfaction Scale (NSS) Positive and Negative affect Scale (PANAS) Self Esteem Scale (SES) Subjective Vitality Scale (SVS) RSSIQ	NSS: 12-item scale, higher score indicates more positive response PANAS: 20-item scale measuring positive (PA) and negative (NA) affect SES: 10-item scale, higher score indicates more positive response SVS: 7-item scale; item scores averaged to form overall vitality scores,	NSS: Cronbach's $\alpha = 0.70$ PANAS: PA subscale Cronbach's $\alpha = 0.87$, NA subscale Cronbach's $\alpha = 0.89$ SES: Cronbach's $\alpha = 0.86$ SVS: Cronbach's $\alpha = 0.87$ RSSIQ: Previously described

higher score indicates greater vitality
RSSIQ: Previously described

Appendix E.

Competence-related psychological factors and outcome scales

Study	Psychological factor	Psychological outcome scale	Scale measurement properties	Scale psychometric properties
Crossman et al.[23]	Emotions	Checklist of emotions based on the work of Izard[32]	Not reported	Not reported
de Heredia et al.[19]	Mood Subjective estimation of injury	Profile of Mood States – Spanish version	Comprises 63 items in subscales of tension, depression, anger, vigour, fatigue, confusion, friendliness; lower score indicates more positive mood	Cronbach's α range 0.77-0.92 for subscale scores in a group of athletes
Glazer[24]	Psychological readiness to return to sport, confidence Mood	Injury Psychological Readiness to Return to Sport scale (I-PRRS) Profile of Mood States-short form (POMS-SF)	I-PRRS: Scored on 0-100 point scale, total scale scored out of 60 points; higher score indicates more positive psychological readiness to return to sport and greater confidence POMS: Possible score range = -20 to 100 points, lower score indicates more positive mood; scoring gives global score (total mood disturbance) and score for the six subscales – fatigue-inertia, vigour-activity, tension-anxiety, depression-dejection, anger-hostility, confusion-bewilderment	I-PRRS: Cronbach's α = 0.78 POMS-SF: Cronbach's α range 0.76-0.94 for global and subscale scores in medical populations and healthy adults
Johnson[26]	Mood Perceptions of readiness to return to sport	Mood Adjective Checklist (MACL) Sports Injury Questionnaire (SIQ)	MACL: Measures 6 bipolar mood dimensions – hedonic tone, activity-passivity, tension-relaxation, extraversion-introversion, positive-negative social orientation, control-lack of control	MACL: Cronbach's α = 0.70

Langford et al.[27]	Emotions Emotions, confidence and risk appraisal	Emotional responses of Athletes to Injury Questionnaire (ERAIQ) Anterior Cruciate Ligament – Return to Sport after Injury scale (ACL-RSI)	ACL-RSI: 12 questions scored on 0-100 point scale; higher score indicates more positive psychological response. ERAIQ: List of 12 emotions to which respondents assign a rank score (from 0-12); score range from 12 to 144; higher score indicates more positive emotional response	ACL-RSI: Cronbach's $\alpha = 0.92$ ERAIQ: Good convergent validity with Incredibly Short Profile of Mood States scale
Podlog et al.[20]	Well-being Perceived psychological return to sport outcomes	PANAS SES SVS RSSIQ	PANAS: Previously described SES: Previously described SVS: Previously described RSSIQ: Previously described	PANAS: Previously described SES: Previously described SVS: Previously described RSSIQ : Previously described
Smith et al.[28]	Emotions Mood	ERAIQ POMS	ERAIQ: Previously described POMS: Comprises 58 items in subscales of tension-anxiety, depression, anger-hostility, vigour-activity, fatigues, confusion-bewilderment; score range from 0-200 with lower score indicating more positive mood	ERAIQ: Previously described POMS: Previously described
Smith et al.[30]	Mood	POMS	POMS: Previously described	POMS: Previously described
Webster et al.[29]	Emotions, confidence and risk appraisal	ACL-RSI	ACL-RSI: Previously described	ACL-RSI: Previously described
