Perceived Social Support, Re-injury Anxiety and Psychological Readiness to Return to Sport in Soccer Players

Highlights:

1. Perceived social support predicts psychological readiness to return to sport following injury in soccer players.
2. Re-injury anxiety during rehabilitation is a mediating psychological factor in the perceived social support-psychological readiness to return to sport relationship.
3. Increasing positive perceptions of social support and decreasing re-injury anxiety during rehabilitation may help soccer players be more psychologically ready to return to sport.

Abstract

The burden of sports injury in soccer is high, while return to sport outcomes following injury are often poor. This is compounded by a current lack of understanding surrounding the factors that may optimise psychological readiness to return to sport. Consequently, in the present study, we aim to further our understanding of these issues by examining the role of perceived social support in predicting psychological readiness to return to sport. In doing so, we extend previous research by examining whether re-injury anxiety is a mediating factor in this relationship. A sample of 150 previously injured soccer players (mean age = 25.32 years) completed measures of perceived social support (PASS-Q), re-injury anxiety during rehabilitation (RIA-R), and psychological readiness to return to sport (I-PRRS). Mediation analyses showed that re-injury anxiety partly accounted for the positive relationship between perceived social support and psychological readiness to return to sport. These findings suggest that injured soccer players with higher perceptions of social support will experience less re-injury anxiety during rehabilitation and, as a consequence, will be more psychologically ready upon return to sport.

Keywords: Social support, re-injury anxiety, soccer, return to sport, rehabilitation

Introduction

Within soccer, the burden of sports injury is high.[1] At the same time, return to sport outcomes for players sustaining injury are often poor (e.g., rates of return to pre-injury sport, return to pre-injury performance, and re-injury).[2] Ideally, a player should only return to sport when they are both physically and psychologically ready to do so.[3] However, in comparison to the physical factors predicting optimal return to sport, psychological factors are less well understood.[4] In this regard, both theory and research suggest a prominent role for social support.[4,5] Therefore, the purpose of the present study was to examine the role of social support in psychological readiness to return to sport following injury in soccer players. In doing so, we aimed to extend previous research by examining whether re-injury anxiety is a mediating/explanatory factor in this relationship.

Psychological Readiness to Return to Sport

There is a growing body of literature examining psychological readiness to return to sport.[6] Generally, psychological readiness is poorly defined. However, in the context of soccer, psychological readiness to return to sport may be considered to be a players' confidence in their ability to perform soccer activities well and to remain injury-free.[7] Psychological readiness predicts which players return to competitive sport following injury,[8] functional performance upon return to sport,[9] and the risk of re-injury.[10] Psychological readiness is therefore an important determinant of optimal return to sport.[3] Understanding the factors that promote psychological readiness to return to sport may help practitioners better support injured players.[6]

Currently, we have a limited theoretical and empirical understanding of how psychological readiness to return to sport is either developed or diminished.[7] One possible theoretical explanation lies with the biopsychosocial model of sport injury rehabilitation.[5] Broadly, this heuristic model suggests that biological (e.g., hormonal, circulatory),

psychological (e.g., emotion, cognition), and socio-contextual factors (e.g., rehabilitation environment, social support) predict sports injury outcomes (e.g., functional performance, psychological readiness to return to sport). Furthermore, the model posits that this occurs via mediating biopsychosocial processes (e.g., pain, function).

There is evidence to support the biopsychosocial model in context of psychological readiness to return to sport. For example, research has found that biological factors (e.g., limb symmetry)[9] psychological factors (e.g., motivation)[11] and socio-contextual factors (e.g., injury to surgery interval)[6] are associated with psychological readiness to return to sport. As sports injury rehabilitation is a social process involving many people (e.g., coaches, medical staff, teammates), one potentially important factor contained within the biopsychosocial model is social support.

Social Support

Broadly, social support is defined as an exchange of resources (i.e., activities and the messages arising from these activities) between individuals, that are intended to help one another.[12] Social support is a complex construct comprising of actual (i.e., size of the social support network and the exchanges received) and perceived features (i.e., subjective judgements of the quality of the available social support relative to a player's needs and expectations). Although these features show a moderate overlap, research suggests that they have differential predictive ability.[13] In regard to the present study, it is perceived social support that is likely most relevant. This is because it is more consistently associated with health-related outcomes (e.g., return to sport outcomes) than actual social support.[14] The operational definition of perceived social support in the present study was taken as the player's subjective judgement that the available social network during injury was sufficiently supportive enough or not, relative to their specific needs.[15, 16]

In context of sports injury rehabilitation in soccer, perceived social support may improve a player's psychological readiness to return to sport. There is some evidence for this notion. For example, a qualitative study of mixed sport players showed that perceptions of social support were related to perceptions of psychological readiness to return to sport.[11] Similarly, a quantitative study of mixed sport players with severe knee injuries found that social support, in the form of group-based rehabilitation classes, significantly improved psychological readiness to return to sport.[17] Taken together, preliminary research suggests that perceived social support may be an important antecedent of psychological readiness to return to sport.

In the present study, we wished to understand why this is the case. According to the biopsychosocial model of injury,[5] perceived social support will have its effect on psychological readiness to return to sport via indirect mechanisms. In other words, perceived social support affects psychological readiness to return to sport via mediating psychological factors such as emotions. One particularly relevant emotion in the context of sports injury rehabilitation is anxiety.[4]

The Mediating Role of Re-Injury Anxiety

Anxiety is a commonly experienced emotion during sports injury rehabilitation.[4,11] At its broadest, anxiety is described as the subjective feeling of apprehension, worry, and tension caused by the perception of a situation as threatening.[18] Given the potentially personally meaningful context of injury rehabilitation, anxiety is likely to manifest in relation to the possibility of re-injury.[19] That is, a player will experience apprehension, worry, and tension regarding the possibility of re-injuring themselves during rehabilitation and re-entry into competition.[19,20] Consequently, re-injury anxiety may be one psychological factor that affects sports injury rehabilitation outcomes (e.g., psychological readiness to return to sport).

Re-injury anxiety may be important in relation to return to sport. In support of this proposition, research has found it to be related to numerous actual and perceived sports injury rehabilitation outcomes which include failing to return to sport at pre-injury levels,[8] greater time-loss from injury,[21] and heightened concerns upon return to sport.[20] In addition, upon return to sport, players with re-injury anxiety are less likely to perform well (e.g., avoid contact situations and give less than required effort levels).[20] Pertaining to the context of the present study, then, experiencing high levels of re-injury anxiety is likely to decrease the likelihood of optimal psychological readiness to return to sport.

There are several factors that can explain the development of re-injury anxiety during rehabilitation (e.g., injury severity, time to surgery, player age).[20] One potentially important factor is a player's perceptions of social support. This is because perceived social support is thought to have a preventative (i.e., inoculating) and palliative (i.e., buffering) relationship with injury-related stress.[12] That is, with lower perceptions of social support, injury-related stress may be amplified, whereas with higher perceptions social support, injury-related related stress may be diminished. As such, higher perceptions of social support activities and messages may help players better cope with the apprehensions, worries, and tensions of re-injuring themselves. In line with this idea, several studies have found that higher perceptions of social support negatively predict anxiety.[22] It can thus be inferred that an injured player with lower perceptions of social support (i.e., dissatisfaction) is more likely to suffer from the effects of re-injury anxiety than a player with higher perceptions of social support.

In regard to an explanatory mechanism that accounts for the relationship between perceived social support and psychological readiness to return to sport, there is evidence that re-injury anxiety is potentially important. Research has related social support to negative affective states such as re-injury anxiety,[23] and re-injury anxiety to psychological readiness to return to sport.[20] Moreover, according to the biopsychosocial model of sport injury and

rehabilitation,[5] re-injury anxiety may mediate this relationship. However, to date, no study has examined these factors in the same study, despite a theoretical and empirical rationale to do so.

The Present Study

Against this background, the first aim of the present study was to further examine the role of perceived social support in psychological readiness to return to sport following injury in soccer players. The second aim was to extend previous research by examining whether re-injury anxiety during rehabilitation is a mediating factor in this relationship. Based on the preceding theoretical and empirical underpinnings, we hypothesised that; (i) perceived social support would positively predict psychological readiness to return to sport and (ii) re-injury anxiety during rehabilitation would mediate this relationship (see Figure 1).

Methods

Participants

Participants were 150 adult soccer players (83 male, 67 female; *M* age = 25.32 years, *SD* = 4.28) who had sustained at least one injury within the last 24 months leading to a minimum injury time-loss from soccer training or matches of eight weeks or more. [11] The sample demographics by sex are presented in Table 1. The mean injury time-loss (i.e., the length of time from injury occurrence to full return to training and competition) caused by sport injury was 17.17 weeks (*SD* = 12.22). Participants were drawn from a range of levels of performance (international, *n* = 11; professional, *n*= 11; semi-professional, *n* = 30; recreational, *n* = 98). Most of the injuries reported were traumatic (i.e., sudden onset of symptoms such as a sprain or strain; *n* = 119) vs. overuse (i.e., insidious onset of symptoms such as tendinopathy or periostitis; *n* = 31) and were considered a new injury (*n* = 126) to the participants versus a re-injury (i.e., same injury type and location after returning to sport; *n* = 24).

Procedure

A university ethics committee approved the study. Informed consent was obtained from all participants prior to the commencement of the study. Our study employed a cross-sectional design. Prior to distribution, the questionnaire was piloted on two separate individuals focussing on the quality of the content, presentation, ease of completion, and then consequently revised. Participants voluntarily completed either an online version of the questionnaire (82%; Qualtrics, Provo, UT, USA) or an identical paper copy (18%). All Likert scales were fully labelled with verbal anchors to be more robust than partially labelled scales. Participants responded to the questionnaire by retrospectively reflecting on their experience of rehabilitation (i.e., perceived social support and re-injury anxiety) and their return to sport following injury (i.e., psychological readiness).

Measures

Perceived Social support. To measure perceptions of social support, we used the Perceived Available Support in Sport Questionnaire (PASS-Q)[24]. The PASS-Q contains 16 equally distributed items which assess dimensions of emotional (e.g., "show concern for you"), esteem (e.g., "boost your sense of competence"), informational (e.g., "give you constructive criticism"), and tangible support (e.g., "help with travel to training and matches"). To contextualise the scale to the injury experience, the items were preceded by the stem: "Think about your overall experience of injury rehabilitation. If needed, to what extent would someone…," with responses scored on a 5-point Likert scale ranging from 0 (not at all) to 5 (extremely so). Based on conceptual suggestions together with previous empirical work we created a total score of perceived social support by averaging across subscales.[12,13] For example, it is plausible that each dimension of perceived social support serves multiple functions.[13] This was termed total perceived social support. The PASS-Q has demonstrated reliability and validity in previous studies with independent samples (α = .79 - .89).[24]

Re-injury anxiety. To measure the intensity of re-injury anxiety, we used the Re-Injury Anxiety Inventory (RIAI).[19] Due to the retrospective nature of the study the following amended from original generic stem sentence preceded the items: "Think about your overall experience of injury rehabilitation. To what extent do the statements reflect how you felt?" The RIAI is focussed upon anxiety over re-injury during rehabilitation (RIA-R) and re-entry back to training/competition (RIA-RE). Given our interest in examining a theoretically [5] and empirically informed sequential process, only the 13-item RIA-R subscale was used (e.g., "I am worried about becoming re-injured during rehabilitation").[20, 23] Participants responded on a 4-point Likert scale ranging from 0 (not at all) to 3 (very much so). The subscale score was calculated by summing items. The RIA-R subscale has demonstrated reliability and validity in previous studies with independent samples (α = .98).[19]

Psychological readiness to return to sport. To measure psychological readiness to readiness to return to sport, we used the Injury–Psychological Readiness to Return to Sport Scale (I-PRSS).[7] Owing to the retrospective nature of the study the scale was preceded by an amended from original generic stem sentence: "Based on your overall experience of returning to soccer after injury, to what extent do you agree with the following statements". The I-PRSS contains 6 items measuring self-confidence relating to performance (e.g., "confidence in my skill level/ability") and injury (e.g., "confidence in the injured body part to handle the demands of the situation"). Each item response was recorded using a scale from 0 (no confidence) to 100 (utmost confidence). A total score for psychological readiness was derived summing the six items and dividing by 10. The I-PRSS has demonstrated reliability and validity in previous studies with independent samples (α = .94).[25]

Data Screening

First, we examined the data for missing values. Due to relatively few missing items (i = 15), we replaced missing responses with mean imputation of the item responses from the

corresponding scale. Secondly, we calculated Cronbach's alpha for each of the study variables, all of which were acceptable (> .70; see Table 2). Finally, we followed procedures described by Tabachnick and Fidell,[26] data were screened for univariate and multivariate outliers. No univariate or multivariate outliers were found.

Analytic Strategy

To address the aims of our study, data analyses had several stages. First, demographic variables of age, sex, injury time-loss, and injury type (i.e., first time injury or re-injury) were analysed for potential confounding effects. Second, we computed means, standard deviations, and bivariate correlations for all variables (see Table 2). We used Cohen's effect size thresholds to interpret the correlation coefficients.[27] Third, following Baron and Kenny [28] we conducted a regression analysis to examine whether the combination of total perceived social support and re-injury anxiety during rehabilitation predicted psychological readiness. This approach highlights three conditions in order to support potential mediating effects: (i) the independent variable predicting the dependent variable; (ii) the independent variable predicting the mediating variable; and (iii) the independent variable and mediator variable predicting the dependent variable. In Step 1, we entered total perceived social support, and in Step 2 we entered re-injury anxiety during rehabilitation. Finally, to further test whether re-injury anxiety during rehabilitation mediated the relationship between total perceived social support and psychological readiness to return to sport, we examined the size and significance of the indirect effect using the PROCESS macro for SPSS (version 28, IBM). We ran the mediation model with bias-corrected bootstrapping (5000 resamples) using 95% confidence intervals (CI).[29] For statistical modelling the sequence of the variables was informed by processes described in the biopsychosocial model of sport injury rehabilitation.[5]

Results

Preliminary Analyses

Demographic analyses and descriptive statistics

To examine potential confounding effects of demographic variables (e.g., sex, age, time-loss, injury type) we inspected mean scores for sex and injury type, and then computed correlations coefficients (i.e., with Pearson and Eta correlations) between sex, age, injury time-loss, and injury type and the study variables. By examining mean scores there were only marginal differences between male and female participants across all study variables other than females, on average, reported slightly lower psychological readiness scores (–4.45 points on a 0-100 scale, see Table 1). All correlation coefficients between sex, age, time-loss and injury type and the study variables were not significant ($p > .05$, $\eta < .20$). Additional partial correlational analysis between the study variables controlling for injury time-loss and age indicated very little influence on the direction and significance of relationships when compared to zero order correlations. According to published cut-offs, on average, participants reported that they had experienced moderate levels of re-injury anxiety during rehabilitation ($M = 29.57$; SD = 9.96) with low-moderate levels of psychological readiness upon return to sport ($M = 37.02$; SD = 12.15).[7,19]

Perceived social support and re-injury anxiety during rehabilitation in psychological readiness to return to sport

Bivariate correlations

Table 2 displays the bivariate correlations between the variables and the effect size of these. Total perceived social support showed a significant small-to-medium negative correlation with re-injury anxiety during rehabilitation (i.e., on average, players with higher total perceived social support had lower re-injury anxiety) and demonstrated a significant medium-to-large positive relationship with psychological readiness to return to sport (i.e., on average, players with higher total perceived social support had higher psychological readiness to return to sport). Re-injury anxiety during rehabilitation showed a significant medium-to-

large negative correlation with psychological readiness to return to sport (i.e., on average, players with high re-injury anxiety had lower psychological readiness to return to sport).

The mediating role of re-injury anxiety during rehabilitation

Regression and mediation analysis

Results from regression analysis indicated that total perceived social support $F(1,148) = 32.41$, $p < .001$, $R^2 = .19$, and re-injury anxiety during rehabilitation $F(1,148) = 38.21$, $p < .001$, $R^2 = .21$, predicted psychological readiness to return to sport. Moreover, when we added re-injury anxiety during rehabilitation was added to the stepwise multiple linear regression model, the effect of total perceived support was reduced in size (from .43 to .33) which is indicative of mediation (see Table 3).[28] These findings are summarised in Figure 2. We then further tested whether re-injury anxiety during rehabilitation mediated the relationship between total perceived social support and psychological readiness to return to sport, as suggested by the regression analyses. Results showed that the mediation effect was significant (indirect effect = 0.11 [95% CI = 0.19, 0.38]). The R^2 value was .32 indicating that this model accounted for 32% of the variance of the response data around the mean.

Discussion

The primary aims of the present study were to further examine the role of perceived social support in psychological readiness to return to sport following injury in soccer players and extend previous research by examining whether re-injury anxiety during rehabilitation is a mediating factor in this relationship. As hypothesised and in line with both theory [5] and research [17] we found that perceived social support was a significant positive predictor of psychological readiness to return to sport. Furthermore, we found support for the mediating role of re-injury anxiety during rehabilitation.

The Mediating Role of Re-Injury Anxiety

To date, this is the first study to examine one psychological process underpinning the relationship between perceived social support and psychological readiness to return to sport. In congruence with theoretical propositions,[5] we found that re-injury anxiety during rehabilitation was a significant mediator of this relationship. In other words, an injured player with higher perceived social support will experience less re-injury anxiety during rehabilitation, and consequently they will be more confident in performing well and remaining injury-free upon return to sport (i.e., more psychologically ready to return to sport). Drawing a comparison to other empirical studies is challenging. However, one similar study by Wadey and colleagues [20] found that social support seeking was not significantly related to re-injury anxiety or return to sport outcomes, in the form of return concerns and renewed perspectives, and was not a significant mediator in the re-injury anxiety – injury outcome relationship. The direction of the relationships were however consistent with our findings. Therefore, the findings from our study are potentially important given the relatively poor rates of returning to competitive sport (e.g., only 41% playing their pre-injury sport at 2-years post-surgery),[8] the negative impact of injury on future performance level,[2] and the factors we examined being related to a subsequent increased risk of injury on return to sport.[10,20]

Other Possible Mediating Pathways

After accounting for the mediating role of re-injury anxiety, we found a significant positive direct relationship between total perceived social support and psychological readiness to return to sport. In other words, the relationship was not fully explained by re-injury anxiety. This finding is suggestive of the potential for other factors to explain this relationship. Revisiting the biopsychosocial model of injury,[5] there are several factors that may be relevant in this regard. For example, other psychological (e.g., rehabilitation

behaviour) and biological (e.g., rate of injury healing) factors may mediate this relationship. These alternative factors are certainly worth considering for future research in this area.

Previous research may also provide some direction for further explanatory factors. These factors include motivation,[11] pain perceptions,[14] and adherence to rehabilitation activities.[21] For example, a soccer player with higher perceptions of social support may be more motivated to return to their pre-injury sport and adhere to their prescribed rehabilitation program. Previous research has rarely accounted for the complex interplay between psychosocial factors and return to sport outcomes. Therefore, examining these variables together with re-injury anxiety or as alternative factors to re-injury anxiety may provide further understanding of the relationship between perceived social support and psychological readiness to return to sport. Future research should aim to test these assertions too.

Limitations and Future Directions

The present study has several limitations. First, we used a cross-sectional design collecting retrospectively recalled and self-reported data (i.e., reflecting on the injury experience). This approach precludes establishing causality, temporality (e.g., change to over time) and can be open to recall bias. Additionally, the RIAI and I-PRRS scale were originally created to gain prospective and concurrent data to support clinical decision-making and not with the intention of being used retrospectively. Although we mitigated this and the scales demonstrating good internal consistency, using state-based measures in this manner may have biased our findings. Future research should seek to use prospective longitudinal designs to better address causal and temporal precedence. Such an approach may better examine the dynamic nature of perceived social support where its effect is thought to be enhanced when its provision is optimally matched with specific needs which likely change through the return to sport process.[16] Second, we only measured perceived social support. It is currently unclear whether received social support is important for psychological readiness to return to sport.

However, including measures of both perceived and received social support may provide a more comprehensive understanding of the role of social support in psychological readiness to return to sport. A third limitation relates to how representative the study sample is of the available population. Specifically, this study relied on participants to actively volunteer to complete the questionnaire. As such, the individuals who met the inclusion criteria but chose not to take part may have contributed different data. Future research should consider adjunctive and alternative methods of recruitment and sampling to garner data from individuals that do not engage in questionnaire research and/or had not been able to return to soccer following injury. Finally, our study was based exclusively on soccer players. It is unclear if the present findings will generalise to other sports and contexts (e.g., individual sports). Future research should aim to examine these relationships in other populations to determine their generalisability and utility.

Applied Implications

The present findings lend themselves to applied recommendations. In this regard, we have two suggestions. First, to optimise psychological readiness to return to sport, practitioners should routinely monitor (i.e., screen) player's perceptions of social support and re-injury anxiety throughout injury rehabilitation (e.g., with the RIAI).[19] Second, practitioners could implement social support interventions with injured players tailored to their support needs in an attempt to diminish feelings of re-injury anxiety. Further research is needed to determine what such interventions should consist of and how effective they can be. However, one practitioner-directed example is provided by Murray et al.,[30] who found that a 2 x's 4-hour communication skills intervention directed at sports injury practitioners led to higher-levels of perceived support provided for patients' psychological needs (i.e., autonomy, competence, relatedness). In accordance with our findings, the higher perceptions of social support may limit the experience of re-injury anxiety during rehabilitation, and as such

increase psychological readiness to return to sport. This is an excellent starting point for future research. It is hoped that together these suggestions may enable practitioners to better support injured soccer players. Last, while interventions may be appropriate for the injured player, organisations and stakeholders may wish to consider the broader environmental and cultural factors that may foster re-injury anxiety and as such limit psychological readiness to return to sport.[31] For example, the train or play through pain mentality and risk-taking culture. This indicates that a multidisciplinary team-based approach to providing high quality social support and reducing re-injury anxiety may be required.

Conclusion

The present study contributes to our understanding of the relationship between perceived social support and psychological readiness to return to sport following injury in soccer players. The study suggests that perceived social support is important in relation to predicting psychological readiness to return to sport. Moreover, it appears that re-injury anxiety during rehabilitation, at least partly, explains this relationship.

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Table 1. *Sample demographics by sex*

Variable		Overall (*n*=150)	Male (*n*=83)	Female (*n*=67)
Age	*M* (SD)	25.32 (4.28)	24.53 (4.94)	26.12 (3.22)
Injury time-loss (weeks)	*M* (SD)	17.17 (12.22)	15.2 (11.18)	19.14 (15.54)
Performance level	*n* (%)			
International		11 (7.3)	2 (18.2)	9 (81.8)
Professional		11 (7.3)	6 (54.5)	5 (45.5)
Semi-professional		30 (20)	19 (63.3)	11 (36.7)
Recreational		98 (65.3)	65 (66.3)	33 (33.7)
Injury type	*n* (%)			
Traumatic		119 (79.3)	55 (46.2)	64 (53.8)
Overuse		31 (20.7)	20 (64.5)	11 (35.5)
First time injury		126 (84)	71 (56.3)	55 (43.7)
Re-injury		24 (16)	6 (25)	18 (75)

Table 2. *Descriptive statistics, bivariate correlations and Cronbach's alpha*

Variable	1	2	3
1. Total perceived social support			
2. Re-injury anxiety	–.24***		
3. Psychological readiness to return to sport	.43***	–.46***	
M	3.58	29.57	37.02
SD	0.88	9.96	12.15
Cronbach's alpha	.95	.94	.88

Note. $N = 150$. *** $p < .001$.

Table 3. *Summary of multiple regression analyses predicting psychological readiness to return to sport*

DV = Psychological readiness to return to sport	ΔR^2	β
Step 1		
Total perceived social support	.19***	.43***
Step 2		
Total perceived social support	.13***	.33***
Re-injury anxiety		–.37***

Note. $N = 150$. β = standardised regression weight. *** $p < .001$.

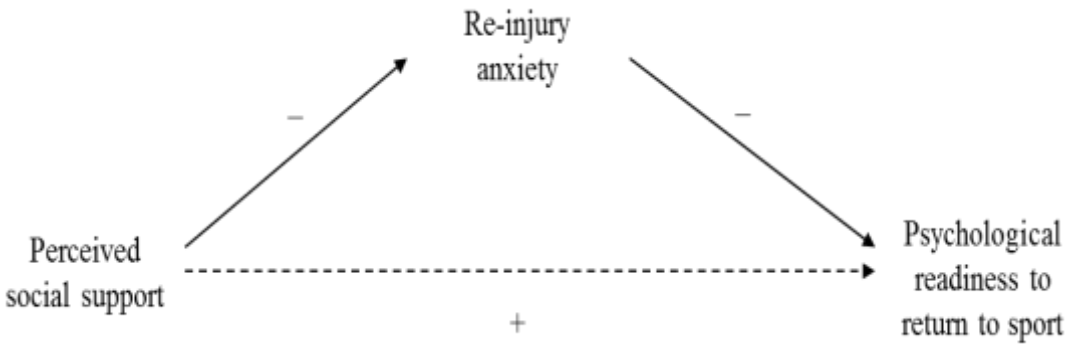

Figure 1. Hypothesised model of the relationship between perceived social support, re-injury anxiety, and psychological readiness to return to sport.

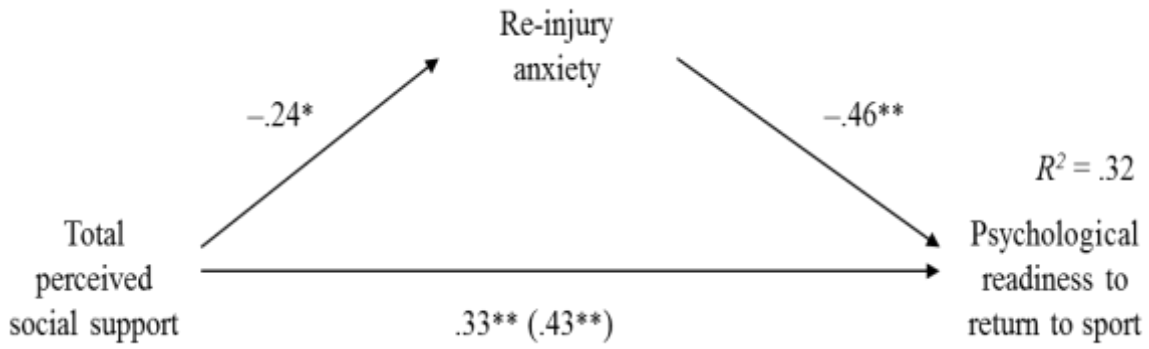

Figure 2. Mediation model of perceived social support and re-injury anxiety predicting psychological readiness to return to sport confidence (N = 150). All coefficients are correlations. *p < .01, **p < .001.