Fear-Avoidance Following Musculoskeletal Injury in Male Adolescent Gaelic Footballers

Abstract

Context: Gaelic football participation provides a wealth of benefits but a risk of musculoskeletal injury also exists. Injury is associated with physical consequences, including pain, discomfort, loss of function, time absent from school/sport, considerable medical expenses along with placing undue pressure on emergency services and hospital staff. Concurrent psychological consequences, such as fear-avoidance, can also occur causing psychological distress. There is a current dearth of available research examining the psychology of injury in male adolescent Gaelic footballers.

Objective: To examine fear-avoidance post-injury in male adolescent Gaelic footballers, the effect of pain, time-loss, injury severity and previous injury on the extent of fear-avoidance and the usefulness of a modified Athlete Fear Avoidance Questionnaire (mAFAQ) as a screening tool for predicting injury.

Design: Prospective cohort study.

Setting: Recreational clubs.

Participants: 97 male adolescent club Gaelic footballers (13.4±1.1 years).

Interventions: Musculoskeletal injuries sustained during Gaelic football participation, defined as any injury sustained during training or competition causing restricted performance or time lost from play,[1] were assessed and recorded weekly by a Certified Athletic and Rehabilitation Therapist. Injuries requiring time loss from participation were classed as time-loss injuries. Injury characteristics that included type, nature, location, severity and pain were recorded.

Main Outcome Measures: Injured players completed the Athlete Fear Avoidance Questionnaire (AFAQ), a measure of injury-related fear-avoidance following injury assessment (AFAQ1). With time-loss injuries, the AFAQ was completed again (AFAQ2) prior to return to play. mAFAQ was completed at baseline.

Results: Twenty-two injuries were recorded during the season with fear-avoidance evident post-injury that significantly decreased before returning to play. Fear-avoidance post-injury was higher in those with greater pain but time-loss, injury severity and previous injury did not significantly affect the extent of fear-avoidance. Baseline fear-avoidance did not predict injury. **Conclusions:** Psychological rehabilitation is recommended for managing post-injury psychological distress in male adolescent Gaelic footballers.

Keywords

Psychological distress, Gaelic games, teenage, boys, injuries

Introduction

The Gaelic Athletic Association plays an important role in the physical activity practices of Irish society with Gaelic football recognized as the most popular club sport for adolescent males.[2] Gaelic football is a high-intensity, high-velocity contact game that requires large volumes of strength, endurance, flexibility and speed[3] where the primary aim of the game is to outscore the opposing team.[4] Matches last up to 60 minutes in duration in adolescents[1] and players may be involved with club, school and county teams simultaneously. Gaelic football participation is associated with an inherent risk of musculoskeletal injury.[5] Musculoskeletal injuries are defined as injuries resulting from direct trauma or overuse sustained during sports participation.[6] Injuries are common in male adolescent Gaelic footballers. Recent research reported one-third of all players sustain an injury over one year and almost half of injured participants suffer a subsequent injury.[1]

Musculoskeletal injury can elicit negative emotional responses that stimulate feelings of depression, anxiety, low vigor, fatigue, grief and burnout, with depression and anger also negatively affecting wound healing.[7] Cognitive appraisal of the injury situation and the psychological response to injury is subjective to each athlete,[8-10] where one athlete may perceive their injury situation to be more stressful than a teammate's perception of a similar situation. Although negative emotional post-injury responses, like frustration, mild depression and irritability may be normal,[11] it is estimated that 10% to 20% of athletes report extreme post-injury responses, including clinical levels of depression, low self-esteem and suicidal ideation, indicating the need for clinical referral.[7] Concern is warranted when the psychological responses are excessive, do not resolve, exacerbate over time, or the athlete is unable to cope.[12] Injured athletes report depression symptoms that are similar to levels of depression reported by patients receiving outpatient medical treatment for mental health issues,[13] which highlights the extent of psychological distress post-injury. Research to date has shown that elite male Gaelic

footballers, who have sustained one or more severe musculoskeletal injuries during their career, increase their chances of experiencing symptoms of psychological distress compared to those who had not suffered severe musculoskeletal injuries during their career.[16] In addition, history of injury results in an increased risk of re-injury.[14-15]

The importance of psychological rehabilitation in conjunction with physical rehabilitation is becoming increasingly recognised as a necessity for holistic recovery from injury. According to the Integrated Model of Response to Sport Injury, the psychological reaction to injury is dependent upon situational and personal factors along with differing behavioral and emotional responses to an injury situation.[17] Fear-avoidance, defined as the avoidance of movements or activities based on fear, is a psychological reaction to injury that can influence the experience of pain[18] and subsequently lead to dysfunction,[19] which may hinder recovery and rehabilitation following injury. Musculoskeletal injury can elicit pain-related fear-avoidance behavioural responses, which stimulate either a confrontation or avoidance approach in the injured player.[18] With confrontation, athletes maintain engagement in physical activity through rehabilitation and involvement in the team environment where functional recovery is promoted.[20] In contrast, dysfunctional interpretations of pain escalate pain-related fear, forcing the athlete to adopt safety-seeking behaviours of avoidance.[20] These avoidance behaviours can reinforce mood disturbances, such as irritability, frustration and depression.[18]

Fear-avoidance has predominantly been measured to date in patients from the general population with chronic low back pain or those who have undergone anterior cruciate ligament reconstruction utilising the Tampa Scale for Kinesiophobia, Pain Catastrophizing Scale and the Fear-Avoidance Beliefs Questionnaire.[21-23] However, these questionnaires have not been developed primarily for use with athletes or have not been validated in physically active cohorts. The Athlete Fear-Avoidance Questionnaire (AFAQ) is a measure of sports injury-related fear-avoidance developed specifically for use with athletes.[19] Athletes are viewed as

having different mental traits to the general population due to their greater reliance on sport and physical activity and thus, require a unique questionnaire.[19] AFAQ is a valid tool for measuring fear-avoidance in athletes and can be easily administered efficiently in a short period of time.[19]

Returning a player to sport without the necessary psychological capacity can lead to fear, anxiety, re-injury, injury to other parts of the body, depression or an overall decline in performance.[24] The implementation of psychological interventions post-injury can moderate any dysfunctional beliefs that may hinder the rehabilitation phase[8] and can facilitate recovery**.** However, in order for sports medicine clinicians to facilitate rehabilitation using psychological interventions, an adequate understanding of the psychological processes involved with injury is essential[8, 25] and the extent of psychological distress experienced by male adolescent Gaelic footballers needs to be understood. No research to date has examined fear-avoidance behaviours in the Gaelic football population and the effect of associated injury characteristics on fear-avoidance. Examining the psychological effect of injury in adolescent Gaelic footballers is crucial as younger athletes under the age of 18 years are at an increased risk of experiencing injury-related psychological distress.[26] Managing the psychological response to injury in the adolescent years may teach the young player how to manage the psychological symptoms associated with athletic injury when they progress into adult level Gaelic football, allowing for longer and more successful sports participation. Thus, this study aimed to establish (i) the extent of fear-avoidance post-injury in male adolescent Gaelic footballers (ii) the effect of pain and days lost from Gaelic football participation on fear-avoidance experienced, (iii) if injury severity and previous injury predict fear-avoidance, and (iv) if a modified version of AFAQ completed at baseline is a useful screening tool in predicting injury.

Methods

Participants

Ninety-seven male adolescent Gaelic football players (13.4 ± 1.1 years) that played at under-14 (n=66) and under-16 (n=31) were recruited from three local Irish Gaelic football clubs. Participants had been playing Gaelic football for 6.2 ± 2.1 years. Ethical approval was granted by the institutes Research Ethics Committee and parental/guardian consent and participant assent was gained prior to the study beginning.

Measures

The validated Athlete Fear Avoidance Questionnaire (AFAQ)[19] is composed of ten statements detailing an athlete's post-injury fear-avoidance thoughts and feelings (Table 1). Each statement is rated on a 5-point Likert scale from 1 (not at all) to 5 (completely agree) and summed to give a total fear-avoidance score. The total score ranges from 10 to 50, with a greater overall AFAQ score indicating greater fear-avoidance. AFAQ showed significant correlations with previously validated catastrophizing and fear-avoidance assessment tools, indicating validity of the measure.[19] The AFAQ was modified (mAFAQ) by authors to create a screening tool for fear-avoidance (Table 2). Each of the ten statements were adapted by adding 'If I was injured' in order to measure injury-related fear-avoidance that a player expects they would experience if they became injured. The mAFAQ was ranked and scored the same as the original AFAQ. A pilot study was conducted in recreational athletes from a variety of sports (n=120; 20.1 ± 3.9 years) to examine the psychometric properties of the mAFAQ. Internal consistency was evident with Cronbach α coefficient of 0.733, indicating high reliability.[28] Construct validity was determined by factor analysis, which identified eigenvalues >1 for 3 items of the mAFAQ, explaining a cumulative percentage variance of 57.2%. However, the first item accounted for 30.7% of the variance, indicating the mAFAQ is a one-dimensional scale. The original AFAQ was also identified as being a one-dimensional scale

and the findings suggest both questionnaires measure different traits of the fear-avoidance model, including fear-avoidance beliefs, kinesiophobia and catastrophizing.[19] The results identify mAFAQ as a valid and reliable measure of baseline fear-avoidance.

A standardized injury report form[1] was utilized to record injuries that occurred during the season. The characteristics of injury, including injury type, nature, location, severity and associated pain both at the time of sustaining the injury and at the time of injury assessment were documented. Pain was recorded using the Visual Analogue Scale (VAS) 0 to 10 scale, which is a valid method for measuring pain.[29] Injury severity was defined according to number of days missed from participation; minor (<7 days), moderate (7-21 days) or severe (>21 days).[1]

[Insert Table 1]

[Insert Table 2]

Procedure

An injury history questionnaire documenting injuries sustained in the previous 12 months and their characteristics was completed at the beginning of the season. Injury history was limited to the previous 12 months to minimize recall errors associated with the collection of retrospective injury data.[30] Participants also completed the mAFAQ to screen for beginning of the season fear-avoidance.

Any participant who sustained an injury during the season (15.2 ± 8.9 weeks duration) reported to the Certified Athletic and Rehabilitation Therapist present at weekly training sessions for an injury assessment. Injuries, recorded using the standardized injury report form,[1] were defined as any injury sustained during training or competition resulting in restricted performance or time lost from play.[1] Injuries that required the participant to miss time from Gaelic football participation were classed as time-loss injuries, whereas non-time-loss injuries did not require the participant to miss participation from Gaelic football. Immediately following the injury

assessment, the injured participant completed the AFAQ, [19] which will be termed the AFAQ1 for the purpose of clarity in this paper. Those who sustained a time-loss injury completed the AFAQ a second time immediately before their first training or match when returning to play, termed the AFAQ2.

Data Analysis

Data was analysed using IBM SPSS version 24 (IBM, New York, USA). Normality was examined using Shapiro-Wilks test, which identified normally distributed data with a significance value greater than 0.05. The mean and standard deviation were calculated for the score of each individual statement and overall mAFAQ, AFAQ1 and AFAQ2 scores. Independent samples T-test compared the difference between AFAQ1 scores for time-loss and non-time-loss injuries. Paired samples T-tests compared AFAQ1 and AFAQ2 scores in those who sustained a time-loss injury and mAFAQ and AFAQ1 scores in participants who sustained an injury during the season. Effect sizes for T-tests, calculated using eta squared, were determined according to Cohens' classification; small=0.01, moderate=0.06 and large=0.14.[31] Pearson correlations identified the relationship between (i) mAFAQ, AFAQ1, AFAQ2 and time-loss from Gaelic football participation and (ii) AFAQ1, AFAQ2 and VAS pain rating and were interpreted using the following classifications: 0.00-0.19=very weak, 0.20-0.39=weak, 0.40-0.59=moderate, 0.60-0.79=strong and 0.80-1.00=very strong.[32] Multiple regression analysis was performed to determine if AFAQ1 scores could be predicted by injury severity and injury history in the previous 12 months. Multicollinearity of the multiple regression analysis was first examined by inspecting the correlation coefficients and variance inflation factors (VIFs), with high correlation (r>0.9) and VIF (>10) indicating multicollinearity. No multicollinearity was noted. Adjusted R square, which explains how much of the variance in the dependent variable is explained by the model, was utilized to explain the variance in the outcome variable. Adjusted R square was utilised for its increased accuracy over R square,

184 which tends to be an optimistic overestimation of the true value in the population.[33] Logistic
185 regression was conducted to analyse if total mAFAQ score predicts injury, with the odds ratio
186 (OR) and 95% confidence interval examined. An OR value greater than one indicated an
187 increased risk of injury. A significance level of 0.05 was set for all statistical tests ($p \leq 0.05$).

Results

Twenty-two injuries were recorded over the season, four of which resulted in time-loss from play, with 18 non-time-loss injuries. The nature of injuries that required time-loss were ligament sprains (n=3) and tendinopathies (n=1). Injury history identified that 54.6% of participants sustained an injury in the previous 12 months, with 21.6% reporting two or more injuries. Hamstring (22.6%) and ankle (18.9%) were the most commonly injured body parts, with injuries predominantly occurring to muscle (39.6%), ligament (26.4%) and bone (24.5%). The average mAFAQ score for all participants at baseline was 23.32 ± 6.01 (Table 3). Average AFAQ1 and AFAQ2 scores for time-loss and non-time-loss injuries are presented in Table 4. No significant differences were evident between average AFAQ1 scores for time-loss (26.75 ± 4.92) and non-time-loss injuries (21.00 ± 7.15) ($t(20)=1.52$; $P>0.05$; $\eta^2=0.10$). However, AFAQ1 scores (26.75 ± 4.92) were statistically greater than AFAQ2 scores (14.25 ± 4.92) in those who sustained a time-loss injury, with a large effect size ($t(3)=5.64$; $P=0.011$; $\eta^2=0.91$). In addition, there was no significant difference between mAFAQ and AFAQ1 in those who sustained an injury during the season ($t(21)=1.503$; $P>0.05$; $\eta^2=0.10$). No significant relationships were evident between mAFAQ, AFAQ1, AFAQ2 or days lost from Gaelic football participation ($r= 0.014$ to 0.595; $P>0.05$). Significant moderate correlations were evident between AFAQ1 and VAS at the time of injury ($r= 0.563$; $P=0.006$) and between AFAQ1 and VAS at the time of injury assessment ($r= 0.596$; $P=0.003$). No significant correlations were evident between AFAQ2 and VAS pain rating ($r= -0.160$ to -0.336; $P>0.05$). Multiple regression analysis identified that injury severity and previous injury explain 8.1% of the variance in AFAQ1 scores in those who sustained an injury during the season, however, the model was not found to be statistically significant ($F_{2,19} = 1.93$; $P>0.05$; $R^2= 0.081$). Injury severity ($\beta= 0.24$; $t= 1.13$; $P>0.05$) and previous injury ($\beta= -0.28$; $t= 1.13$; $P>0.05$) when examined individually did not contribute significantly to the model. Baseline fear-avoidance

was not a significant predictor of injury explaining 0.6% to 0.9% of the variance (P>0.05). However, the odds of sustaining an injury was slightly higher for those with higher baseline fear-avoidance (OR=1.03; 95% CI=0.95-1.12; P>0.05).

[Insert Table 3]

[Insert Table 4]

Discussion

This study aimed to establish the extent of fear-avoidance post-injury in male adolescent Gaelic footballers, the effect of pain, days lost from Gaelic football participation, injury severity and previous injury on the amount of fear-avoidance reported and the usefulness of a modified AFAQ as a screening tool for predicting injury.

Fear-avoidance post-injury

The average AFAQ score reported in this study (22.1 ± 7.1) is similar to that of a sample of currently injured and previously injured collegiate athletes (n=103) from a variety of sports (23.7 ± 7.0)[19] and a sample of adults (n=102; 25 ± 8.5 years) with a sports-related injury (26.0 ± 8.0).[34] Despite age differences between the adolescent, collegiate and adult participants, similar fear-avoidance is evident, outlining that adolescent Gaelic footballers experience psychological distress levels comparable to their adult counterparts. No research to date has identified fear-avoidance in Gaelic footballers, therefore, comparisons to other Gaelic football populations are unable to be completed. Nevertheless, there is a clear necessity for psychological intervention programs following injury in those that display fear-avoidance.

Fear-avoidance and pain

Fear-avoidance post-injury was higher in those with greater pain scores as measured by the VAS scale. Similar findings were found between pain and fear-avoidance in adults with a sports-related injury,[34] in physically active individuals with osteoarthritis[35] and patients with acute[36] and chronic low back pain.[37] These results support the fact that pain tolerance is a moderator of the psychological response to injury[17] and has significant physical and psychological effects on recovery.[38] In contrast, fear-avoidance has been defined as the fear of pain in chronic low back pain literature to date.[23, 39] The lack of a significant relationship between fear-avoidance prior to return to play and VAS pain ratings, which indicates that pain experienced when the injury was sustained does not relate to fear-avoidance prior to return to

play, highlights that this definition of fear-avoidance may not be appropriate in a high-functioning, physically active population. If fear-avoidance was solely to describe a fear of pain, an association between fear-avoidance and pain would be anticipated at any point following injury, particularly at a point of return to play post-injury. Fear-avoidance in injured athletes may instead be associated with the greater injury experience and the avoidance of movements or activities based on fear[18] and the negative emotional response to injury that stimulate feelings of depression, anxiety, low vigor, fatigue, grief and burnout.[7]

Fear-avoidance, time-loss and injury severity

Similar fear-avoidance was identified for participants who sustained time-loss and non-time-loss injuries, which suggests the duration of time loss from Gaelic football participation does not affect the extent of fear-avoidance. In addition, no significant relationships were noted between the duration of time-loss from Gaelic football participation and fear-avoidance at baseline, post-injury and prior to return to play. However, this finding conflicts with previous research that identified time loss duration as a moderator of the psychological response to injury.[17] Time loss duration may not be a moderating factor in the current study due to the low number of injuries that required missed participation from Gaelic football. Current injury severity (i.e. minor, moderate or severe based on the number of days lost from Gaelic football participation) was also not a significant predictor of fear-avoidance post-injury, despite previous research identifying that more severely injured athletes experience greater mood disturbances following injury when compared to those who suffer moderate to acute injuries.[8] Most injuries in the current study were minor in nature requiring less than 7 days absence from Gaelic football participation and only four time-loss injuries were noted, which may have impacted this finding. The lack of significant difference between fear-avoidance in participants who sustained time-loss and non-time-loss injuries and the lack of interaction between injury severity, days lost from Gaelic football participation and fear-avoidance could be attributed to

the prevalence of male adolescent Gaelic footballers who continue to play through injury.[1] Playing through injury results in no time-loss from Gaelic football participation, thus meaning time-loss may not affect fear-avoidance in this youth sample of the population. In addition, fear-avoidance was measured following the injury assessment where participants were aware of the nature of their injury but the extent of time loss from Gaelic football participation was not clear at that time.

Baseline fear-avoidance

Fear-avoidance was evident at the beginning of the season, but greater fear-avoidance did not increase the likelihood of sustaining an injury over one season. Similarly, fear-avoidance following injury was not significantly greater than baseline fear-avoidance and previous injury did not predict fear-avoidance post-injury. To our knowledge, no research to date has identified fear-avoidance at baseline prior to sustaining an injury so comparisons to similar research cannot be made. The baseline mAFAQ measured players' perceptions of fear-avoidance at the start of the season that may be experienced if they became injured. However, male adolescents' perceptions of their fear-avoidance may differ from their actual fear-avoidance experienced post-injury. Situational factors (level of competition, time in season, playing status, teammate/coach influences, family dynamics or social support), personal factors (player demographics, injury characteristics, injury history, pain tolerance, motivation, athletic identity, social support or mood states) or behavioural and emotional responses (risk-taking behaviours, rehabilitation adherence, tension, anger, depression, grief or emotional coping) can alter the psychological response to injury.[17] The stress-athletic injury model highlights that an athlete who exhibits increased amounts of stress due to their personality, history of stressors or subjective coping resources, may be at increased risk of sustaining an injury.[40] Therefore, fear-avoidance is highly subjective and situationally based so solely implementing baseline screening or post-injury measurement of fear-avoidance may not be useful. Instead clinicians

should screen for athletes who show elevated stress levels at the beginning of the season that can increase their risk of injury but also measure fear-avoidance post-injury that may overwhelmingly influence the physical and psychological response to injury that has the potential to hinder rehabilitation.

Fear-avoidance prior to return to play

Male adolescent Gaelic footballers experience fear-avoidance and psychological distress when they sustain an injury but following a period of time-loss from Gaelic football participation and rehabilitation, fear-avoidance reduces. Similar trends have been identified in previous research with negative emotions of tension, depression, anger, fatigue and confusion shown to decrease from the time of injury evaluation to the point of full recovery.[24] This difference could be due to the benefits of rehabilitation and the return to play process, which focuses on returning the athlete to sports participation and their pre-injury level of performance.[41] Meeting rehabilitation goals and successfully improving the components of performance, such as strength, flexibility and proprioception, could potentially help to reduce fear-avoidance by improving confidence in the injured body part. However, only four time-loss injuries were observed so the clinical applicability of this finding is limited. A clearer image of fear-avoidance in participants who sustain a time-loss injury may be evident with a greater number of time-loss injuries.

Limitations

A substantially low number of time-loss injuries were observed in this study, which may be due to the short season over which data was collected. The small number of time-loss injuries may impact the ability of this study to examine time-loss and its relationship to fear-avoidance. Furthermore, injury history was only determined for injuries sustained by participants in the previous 12 months in order to reduce the effects of recall bias. However, previous injury is a risk factor for re-injury and its relationship with the extent of fear-avoidance at baseline and

following injury may be different when examined over a longer period. In addition, this study failed to account for the occurrence of serious traumatic injury occurring greater than 12 months previous requiring surgical repair and substantial rehabilitation, despite the fact that these injuries may still insight increased levels of fear greater than 12 months post-injury. However, the incidence of sports injuries in youth participants requiring operative treatment is expected to be low with only 8.8% of sports injuries presenting to paediatric hospitals requiring surgery[42] and 6.7% of adolescents requiring surgery due to a Gaelic football injury.[1] In addition, this study solely examined fear-avoidance in male adolescent Gaelic footballers, which makes it difficult to apply the findings to collegiate and elite players or female Gaelic footballers. Future research should examine fear-avoidance and the psychological reaction to musculoskeletal injury across Gaelic football populations in a larger cohort of male adolescents and across a number of seasons.

Conclusions

Fear-avoidance is evident in male adolescent Gaelic footballers comparable to levels experienced by injured collegiate and adult athletes. Fear-avoidance post-injury was higher in those with greater pain scores. However, baseline measures of fear-avoidance did not predict the likelihood of sustaining an injury over one season, which indicated that fear-avoidance should be examined when a Gaelic footballer sustains an injury. The findings highlight the need for psychological rehabilitation in conjunction with physical rehabilitation in the management of an injured Gaelic footballer and their successful return to sport. Awareness of the extent of fear-avoidance in injured players allows clinicians to design an effective rehabilitation plan that can manage both the physical and psychological recovery required and may consequently reduce the period of time loss from participation.

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458 **Table 1 Athlete Fear Avoidance Questionnaire Statements (Dover and Amar, 2015)**

Question 1	I will never be able to play as I did before my injury.
Question 2	I am worried about my role with the team changing.
Question 3	I am worried about what other people will think of me if I don't perform at the same level.
Question 4	I am not sure what my injury is.
Question 5	I believe that my current injury has jeopardized my future athletic abilities.
Question 6	I am not comfortable going back to play until I am 100%.
Question 7	People don't undertand how serious my injury is.
Question 8	I don't know if I am ready to play.
Question 9	I worry if I go back to play too soon I will make my injury worse.
Question 10	When my pain is intense, I worry that my injury is a very serious one.

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460 **Table 2 Modified Athlete Fear Avoidance Questionnaire Statements**

Question 1	If I was injured, I would never be able to play as I did before my injury.
Question 2	If I was injured, I would be worried about my role with the team changing.
Question 3	If I was injured, I would be worried about what other people will think of me if I don't perform at the same level.
Question 4	If I was injured, I would not be sure what my injury is.
Question 5	If I was injured, I would believe that my current injury has jeopardized my future athletic abilities.
Question 6	If I was injured, I would not be comfortable going back to play until I am 100%.
Question 7	If I was injured, people would not undertand how serious my injury is.
Question 8	If I was injured, I would not know if I was ready to play.
Question 9	If I was injured, I would worry if I go back to play too soon I would make my injury worse.
Question 10	If I was injured and my pain was intense, I would worry that my injury is a very serious one.

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462 **Table 3 Average baseline mAFAQ scores**

	All participants (n=97)	Injured participants (n=20)	Non-injured participants (n=77)
mAFAQ		**Mean Score ± SD**	
Question 1	1.57 ± 0.88	1.60 ± 0.94	1.56 ± 0.87
Question 2	2.03 ± 1.07	2.05 ± 1.15	2.03 ± 1.05
Question 3	2.06 ± 1.06	1.90 ± 0.97	2.10 ± 1.08
Question 4	2.23 ± 1.31	2.45 ± 1.39	2.17 ± 1.29
Question 5	2.01 ± 1.10	1.85 ± 1.09	2.05 ± 1.11
Question 6	2.24 ± 1.32	2.35 ± 1.42	2.21 ± 1.30
Question 7	2.51 ± 1.21	2.65 ± 1.14	2.47 ± 1.23
Question 8	2.54 ± 1.23	2.50 ± 1.10	2.55 ± 1.26
Question 9	2.81 ± 1.54	3.00 ± 1.56	2.77 ± 1.54
Question 10	3.33 ± 1.51	3.10 ± 1.48	3.39 ± 1.51
Total	23.32 ± 6.01	23.45 ± 6.13	23.29 ± 6.02

463 Notes: mAFAQ= Modified Athlete Fear Avoidance Questionnaire; SD= standard deviation

464 **Table 4 Average AFAQ1 and AFAQ2 scores for time-loss and non-time-loss**
465 **injuries**

	AFAQ1			AFAQ2
	Time-loss injuries	**Non-time-loss injuries**	**All participants**	**Time-loss injuries**
	Mean Score ± SD			
Question 1	2.75 ± 1.26	1.61 ± 0.85	1.82 ± 1.01	1.25 ± 0.50
Question 2	2.25 ± 1.26	2.06 ± 1.21	2.09 ± 1.19	1.25 ± 0.50
Question 3	2.50 ± 0.58	2.61 ± 1.42	2.59 ± 1.30	2.00 ± 1.41
Question 4	3.25 ± 0.96	1.56 ± 0.86	1.86 ± 1.08	1.75 ± 1.50
Question 5	2.25 ± 0.96	1.67 ± 0.69	1.77 ± 0.75	1.00 ± 0.00
Question 6	3.25 ± 0.96	2.44 ± 1.38	2.59 ± 1.33	1.50 ± 0.58
Question 7	1.75 ± 0.50	2.06 ± 0.87	2.00 ± 0.82	1.50 ± 1.00
Question 8	3.50 ± 0.58	2.17 ± 1.38	2.41 ± 1.37	1.00 ± 0.00
Question 9	3.00 ± 1.15	2.56 ± 1.38	2.64 ± 1.33	1.50 ± 0.58
Question 10	2.25 ± 1.50	2.28 ± 1.32	2.27 ± 1.32	1.50 ± 0.58
Total	26.75 ± 4.92	21.00 ± 7.15	22.05 ± 7.07	14.25 ± 4.92

466 Notes: AFAQ1= Athlete Fear Avoidance Questionnaire completed following injury
467 assessment; AFAQ2= Athlete Fear Avoidance Questionnaire completed prior to return to play;
468 SD= standard deviation