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Perceived instability, pain, and psychological factors predict function and disability in individuals with chronic ankle instability

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Context: Chronic ankle instability (CAI) is associated with residual instability, pain, decreased function, and increased disablement. Injury-related fear has been associated with CAI, although its relationship to other impairments is unclear. The Fear-Avoidance Model is a theoretical framework hypothesizing a relationship between injury-related fear, chronic pain, pain catastrophizing, and disability. It has been useful in understanding fear's influence in other musculoskeletal conditions but has yet to be studied in those with CAI.

Objective: To explore relationships between instability, pain catastrophizing, injury-related fear, pain, ankle function, and global disability in individuals with CAI.

Design: Cross-Sectional Study

Setting: Anonymous online survey

Patients or Other Participants: A total of 259 people, recruited via e-mail and social media, with a history of ankle sprain completed the survey; of those, 126 participants (age=32.69±4.38, female=84.92%, highly active=73.81%) were identified to have CAI and were included in the analysis.

Main Outcome Measure(s): Demographics included gender identity, age, and physical activity level. Assessments encompassed the Identification of Functional Ankle Instability (instability), the Pain Catastrophizing Scale (pain catastrophizing), the Tampa Scale of Kinesiophobia-11 (injury-related fear), a numeric pain rating scale and activity-based question (pain presence), the Quick-FAAM (ankle function), and the modified Disablement in the Physically Active Scale (disability). Relationships between variables were explored through correlation and regression analyses.

Results: After controlling for instability and pain, pain catastrophizing and injury-related fear were significantly related to function and disability ratings in individuals with CAI. Together, the variables predicted 48.7% (P<.001) variance in function and 44.2% (P<.001) variance in disability.

Conclusions: Greater instability, pain, greater pain catastrophizing, and greater injury-related fear were predictive of decreased function and greater disability in those with CAI. This is consistent with the hypothesized relationships in the Fear-Avoidance Model, although further investigation is needed to determine causality of these factors in the development of CAI.

Key Words: ankle sprain, patient-reported outcomes, dimension-specific outcomes, health-related quality of life

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Key Points:

- Greater instability and pain catastrophizing, presence of pain, and greater injury-related fear were related to lower function and greater disability in physically active individuals with chronic ankle instability (CAI).
- Clinicians should begin to identify these factors in CAI patients and explore intervention strategies for reducing pain and injury-related fear as this may assist in improving function and disability.

- Investigations demonstrating the influence of cognitive-affective factors like pain catastrophizing and injury-related fear on the development of chronicity after ankle sprain are still needed.

Out of 11.8 million physician office visits annually, 23% involve a sprain or strain injury to the ankle or foot.[1] Disruption or stretch of the lateral ankle ligaments, most often the anterior talofibular and in more severe cases the calcaneofibular ligaments[2] have the highest incidence (0.93 out of 1,000 exposures) when compared to other types of ankle sprains.[3] Lateral ankle sprains are often regarded as benign injuries that will resolve quickly with minimal treatment. While there are patients, known as ankle sprain copers, who seem to fully recover after their ankle sprain injury, evidence suggests that 40% of individuals continue to suffer from recurrent sprains, episodes of instability, and perceived ankle instability for over one year after their initial sprain.[3] These characteristics comprise a condition known as chronic ankle instability (CAI).[4] Many other impairments have been identified within the CAI population including stability and movement pattern alterations, decreased perceived levels of ankle function, increased levels of global disability, physical activity restrictions, and post-traumatic ankle osteoarthritis.[5] Despite decades of research, it is still not fully understood which specific factor, or combination of factors, lead some patients down this continuum of disability.

Chronic musculoskeletal conditions are typically characterized by both disability and pain,[1] however, pain has not been a major focus in the CAI literature despite evidence of persisting pain after ankle sprains beyond the typical acute stage.[6] A recent retrospective analysis revealed 60% of CAI participants in previous research studies reported pain during different levels of activity.[7] The role of pain in CAI is still unknown but it has shown associations with perceived instability[7] and function[8] in recent reports. Despite this, the intensity of recurrent pain in this population was reported to be a mild intensity,[9] which may not alone contribute to changes in function. It is well-documented that pain is inextricably linked to emotional and cognitive functions.[10] Injury-related fear is a cognitive-affective factor that has been identified in individuals who develop CAI.[11] Injury-related fear has shown associations to negative outcomes after injury regarding physical impairments, recovery, and function in other musculoskeletal conditions through use of the fear-avoidance model (FAM).[12-14]

The FAM is a cognitive-behavioral model that postulates that exaggerated negative beliefs about pain, known as pain catastrophizing, can lead patients into a cycle of fear and activity avoidance.[15] These changes can lead to disuse which can often create new pathological pain pathways beyond the healing of the originally injured tissue, that continues these individuals down the path toward chronic pain and disability. On the other side of the model, individuals who do not prioritize pain-related thoughts after injury are hypothesized to be able to then confront their pain and injury, which leads them towards full recovery and function.[15] The most recent model for CAI proposes that after an ankle sprain injury an individual will fall along a spectrum of outcomes ranging from coper (fully recovered) to CAI (chronic disability)[5] which mirrors the hypothesized outcomes in FAM. As such, the FAM and its components may also serve as a theoretical model for understanding the development of CAI in some individuals post-ankle sprain.

Therefore, the purpose of this study was to determine whether the FAM and its components may be applicable to patients with CAI by examining relationships between pain catastrophizing, injury-related fear, pain, ankle function and global disability. This was tested through three specific aims. Our first aim was to examine the relationship between the two cognitive-affective model components – pain catastrophizing and injury-related fear. Pain catastrophizing is thought to contribute to the development of injury-related fear, but it is also possible that those who are fearful of re-injury may adopt pain catastrophizing cognitions that increase focus on the feared stimuli of pain. Thus, our first hypothesis was that greater pain catastrophizing beliefs would be related to greater levels of reported injury-related fear. Our second aim was to determine the influence of pain presence on reported function and disability. We hypothesized that the presence of pain would explain additional variance beyond reported instability in both ankle function and global disability outcomes. Our third aim was to determine the unique role of the cognitive-affective model components in predicting function and disability. We hypothesized that when controlling for instability and pain, both pain catastrophizing and injury-related fear would uniquely explain additional variance in both function and disability.

Methods

This study used a cross-sectional, online survey design and was approved as exempt research by the [redacted] Health Sciences Human Subjects Review Committee in December 2020. Recruitment for potential participants occurred over a 4-week period and was done via email in a university setting, and through shareable social media posts (Facebook and Twitter) to broaden our geographical and demographic reach. Participants were required to be between the ages of 18 and 40 years old. Inclusion and exclusion criteria for potential CAI participants followed the guidelines set forth by the International Ankle Consortium[4] and questions pertaining to these criteria were included in the survey to determine eligibility.

Participants were classified as having CAI if they reported at least one significant ankle sprain which was sustained at least 12 months prior to the survey and also reported residual symptoms including recurrent ankle sprains, and/or 2 or more giving away episodes in the previous 6 months, and/or perceived instability classified as a score ≥ 11 on the Identification of Functional Ankle Instability (IdFAI).[4] Individuals were excluded if they had sustained an acute lower extremity injury within the past three months, or had a history of lower extremity fracture or surgery.

We used Qualtrics (Provo, Utah) to create the anonymous survey which consisted of 37 total questions. This included the informed consent, a demographic section, general inclusion and exclusion criteria, specific questions and tools to determine the classification of CAI, and the patient-related outcome assessments for collecting pain catastrophizing, injury-related fear, pain, ankle function, and global disability outcomes. As each of the patient-related outcome assessments have established validity and reliability levels, no additional validation was completed for our survey. Additionally, the patient-related outcome assessments were organized into matrix-type questions to lower the overall total number of questions in the survey.

Pain Catastrophizing

The Pain Catastrophizing Scale (PCS) was used to assess pain catastrophizing beliefs.[16] It was chosen because it has been used in other ligament injury populations[13] and has also demonstrated strong internal consistency (α=0.93), good test-retest reliability (ICC=0.75), validity,[16,17] and has demonstrated factor stability across sexes and in both injured and non-injured, pain-free populations.[18] The PCS is a 13-item scale assessing the frequency of negative pain-related beliefs and ranges from 0 (*not at all*) to 4 (*always*). Total scores are calculated (ranging from 0-52), along with three subscale scores assessing magnification, rumination, and helplessness, with higher scores indicating higher levels of pain catastrophizing.

Injury-Related Fear

The Tampa Scale of Kinesiophobia-11 (TSK-11) was used to assess fear of movement and re-injury.[19] It has demonstrated good internal consistency (α=0.79), test-retest reliability (ICC=0.81), and validity when compared to the original 17 item scale,[19] and has demonstrated differences between individuals with and without CAI.[20] It is an 11-item scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) yielding total scores ranging from 11-44, with higher scores indicating higher levels of fear related to movement and re-injury.

Pain

Pain was used as a binary outcome (present or not present) for the purpose of this study and was determined using the answer on two survey questions. The first question is from the Cumberland Ankle Instability Instrument (CAIT) and states, "I have ankle pain" and has six potential answers (walking on level surfaces, walking on uneven surfaces, running on level surfaces, running on uneven surfaces, during sport, or never). Participants who reported pain during any level of physical activity were considered to have pain.[7] Because this question describes conditional pain activities, the use of a numerical rating scale for pain was also used secondarily to determine pain presence. Participants were also asked to rate their highest level of ankle pain they have experienced within the past week on a scale from 0 (*none*) to 10 (*worst pain imaginable*). Any participant who responded with reported pain > 0 was considered to have pain.

Ankle Function

The Quick-FAAM is a regional scale designed to determine functional limitations in those with foot and ankle conditions.[21] It is a shortened version of the Foot and Ankle Ability Measure (FAAM) and retained five items from the FAAM-Activities of Daily Living and seven items from the FAAM-Sport subscales. It is a 12-item scale ranging from 4 (*no difficulty at* all) to 0 (*unable to do*). Scores are totaled and transformed into percentages, with 100% being representative of no functional loss. It has demonstrated strong internal consistency ($\alpha = 0.94$),[21] and acceptable test-retest reliability,[22] and recently was found to be able to distinguish between individuals with CAI and copers, with CAI patients demonstrating lower scores.[23]

Global Disability

The modified Disablement in the Physically Active Scale (mDPA) is a global scale designed for individuals who are physically active.[24] The mDPA has demonstrated high test-retest reliability (ICC=0.943) and internal consistency (α=0.890–0.908).[24] The mDPA is 16 items ranging from 0 (*no problem*) to 4 (*severe*) and addresses both physical and mental factors. Total scores range from 0-64, with higher scores being indicative of increased disablement. The mDPA has shown to detect differences in those with and without CAI, with individuals with CAI reporting higher disablement.[20]

Statistical Analyses

Statistical analyses were performed using IBM SPSS Statistics, version 27 (IBM Corporation, Armonk, NY) on all participants who were classified as CAI. Individuals were excluded if the survey was not completed in its entirety or if they did not meet the full inclusion and exclusion criteria. Demographic variables are summarized as either mean (standard deviation) or as n (%) overall. To test the first hypothesis, Pearson-product moment correlations were used to evaluate the relationships between pain catastrophizing (PCS) and injury-related fear (TSK-11), and correlation coefficients (r) were interpreted as (negligible < 0.3, low = 0.3-0.49, moderate = 0.5-0.69, high = 0.7-0.89, very high = 0.9-1.0).[25]

To test our second hypotheses, two hierarchical linear regression models were used to determine the influence of pain presence on function and disability. The Quick-FAAM and mDPA served as the outcome variable in their respective models. For both models, the IdFAI score was used as a control variable and therefore entered in the first block. Pain was then entered as a two-level predictor (0=no pain; 1=pain) into the second block to determine its additional utility in predicting function and disability.

To test our final hypotheses, two hierarchical linear regression models were used to determine the influence of the cognitive-affective outcomes on function and disability. Again, the Quick-FAAM and mDPA served as the outcome variable in their respective models. For these analyses, both IdFAI and pain were used as control variables and entered in block one. PCS and TSK-11 were then simultaneously entered into the second block to determine their additional utility in predicting function and disability.

The data were assessed for bias by identifying any cases that may be outliers or influential, and although in all models, a few cases were found to have residuals >±2 standard deviations and one case in the mDPA model was found to have residuals >±3 standard deviations, all cases proved not be influential (Cooks distance <1) to their models. Linearity and additivity were assessed by plotting the predictors and outcome to ensure this assumption was satisfied. Effects due to multicollinearity were limited by ensuring the Pearson's correlation coefficients between predictor variables in the final model were less than 0.9, inspecting variance inflation factors and tolerances, and examining the variance distribution on the eigenvalues in the collinearity diagnostics table. The assumption of homoscedasticity was verified by inspection of the regression of standardized residual versus regression of standardized predicted value plot. Durbin-Watson testing yielded no problem with the assumption of independent errors, and although normality of errors testing indicated a slight skew in the data, we assumed normality based on the central limit theorem (>30 participants) and used bootstrapping to re-estimate the robustness of the significance testing of the model parameters, and to obtain 95% bias corrected (BCa) confidence intervals using 1,000 iterations. All assumptions were tested with strategies presented by Field.[26] Overall performance of the final model was evaluated using R^2 and significance was set to *a priori* at $p < 0.05$.

Results

Due to the nature of our recruitment strategy, we were unable to determine the number of potential participants that our survey could have reached, however, of those that accessed the survey (n = 314), 259 completed and submitted their answers, for a completion rate of 82.5%. Of those who completed the survey, 114 did not meet the basic inclusion and exclusion criteria (8 due to age, 56 due to history of surgery, 36 due to history of fracture, 13 due to recent acute injury, and 1 reporting no history of a significant ankle sprain). An additional 19 did not meet our CAI criteria, which left a total of 126 CAI participant responses that were included in our analysis. Demographic data and mean outcome measure scores for participants are presented in Table 1.

We found a significant, low, positive relationship between PCS and TSK-11 scores (r =0.493, 95% BCa CI [0.357, 0.606], $P < .001$), indicating that as reported levels of pain catastrophizing increased so did reported levels of injury-related fear.

The model with IdFAI entered as a single predictor significantly explained 23.4% of the variance in Quick-FAAM scores ($R^2 = .234$, $P < .001$), and the addition of pain significantly improved the Quick-FAAM model by accounting for an additional 8.9% of the variance (FΔ = 16.099 (1, 123) $P < .001$). For the final model, both IdFAI and pain were found to be significantly negatively related to Quick-FAAM ($R^2 = .322$, $P < .001$) and each predictor demonstrated unique predictive utility (Table 2).

The model with IdFAI entered as a single predictor significantly explained 21.4% of the variance in mDPA scores ($R^2 = .214$, $P < .001$), and again, the addition of pain significantly improved the mDPA model by accounting for an additional 6.6% of the variance (FΔ = 11.198 (1, 123) $P = .001$). For the final model, both IdFAI and pain were found to be significantly positively related to mDPA (R^2 = .280, $P < .001$), and each predictor demonstrated unique predictive utility (Table 3).

As noted in the previous Quick-FAAM analysis, both IdFAI and pain presence were found to be significant predictors of Quick-FAAM scores, accounting for 32.2% of the variance. The addition of the cognitive-affective outcomes (PCS and TSK) to the model significantly improved the Quick-FAAM model by accounting for an additional 16.5% of the variance (FΔ = 19.434 (2, 121) $P < .001$). For the final model, all predictors were significantly negatively related to Quick-FAAM (R^2 = .487, $P < .001$), and each predictor demonstrated unique predictive utility (Table 4).

Similarly, in the previous mDPA analysis, both IdFAI and pain presence were found to be significant predictors of mDPA scores, accounting for 28.0% of the variance. The addition of the cognitive-affective outcomes (PCS and TSK-11) to the model significantly improved the mDPA model by accounting for an additional 16.2% of the variance (FΔ = 17.578 (2, 121) $P <$ .001). For the final model, all entered predictors were significantly positively related to mDPA (R^2 = .442, $P < .001$), and each predictor demonstrated unique predictive utility (Table 5).

Discussion

The purpose of our study was to apply the FAM to the CAI population by investigating specific relationships between some of the model components. We were first interested in investigating whether a relationship existed between pain catastrophizing and injury-related fear variables as no literature has investigated pain catastrophizing in the CAI population thus far. Our hypothesis was supported in that higher levels of pain catastrophizing were significantly related to higher levels of injury-related fear. This relationship is hypothesized to exist because individuals who catastrophize pain and injury appraise pain as highly threatening. This increase in the value given to the threat of pain is therefore believed to lead someone to develop fear regarding movements that are associated with pain and injury.[15] Although our study cannot infer the direction of this relationship, our results demonstrate that they are significantly related constructs. There is some debate in the literature on the uniqueness of these inter-related variables,[18] however, we found the strength of this relationship was just under moderate. So, although the constructs were found to be related, our results indicate they are unique and independent constructs and could both be used in further analyses. Others studying these variables have produced similar findings to ours.[13,18] Further, as injury-related fear is an established factor related to CAI,[11] this relationship does suggest that pain catastrophizing may be another cognitive-affective variable warranting further investigation in the ankle sprain population.

It is well-established that CAI can result in individuals reporting deficits in ankle function and greater levels of global disability. The FAM postulates that pain, pain catastrophizing, and injury-related fear would lead an individual to avoidant behavior which then sends them down the road of disability. Therefore, our remaining hypotheses had specific interest in how pain, pain catastrophizing, and injury-related fear related to reported ankle function and disability. Our second aim was to determine the predictive utility of symptom-related factors that have been established in the CAI population on function and disability with a special interest in determining the additional utility of pain presence on these outcomes as the role of persistent pain in the CAI population has been somewhat overlooked. Our results indicate that greater levels of perceived instability were associated with lesser reported ankle function and greater reported disability within our CAI participants. Perceived instability significantly predicted 23.4% of variance in reported ankle function and 21.4% of variance in reported disability. Perceived instability is one of the characterizing symptoms of CAI[4] so it is not surprising that this variable would serve as an important predictor. Our hypothesis was further supported in that the models significantly improved when adding pain presence as an additional predictor which accounted for an increased 8.9% and 6.6% of the variance in reported ankle function and disability, respectively. This finding is consistent with a recent cross-sectional study that found relationships exist between reported pain and function in their CAI sample[8] and suggests that beyond perceived instability, individuals who reported pain during activities specified by the CAIT or reported pain within the past week, reported lower levels of ankle function and greater disability. Perceived instability and pain have demonstrated a relationship in a recent investigation,[7] but despite this, we found both variables to be unique predictors of function and disability and contribute similar weight to the model.

Our final models, including all four variables, explained 48.7% of the total variance in reported ankle function and 44.2% of the total variance in reported disability. Each predictor was found to significantly add to the model and reveals that greater perceived instability, pain presence, greater pain catastrophizing, and greater injury-related fear were related to lesser reported ankle function and greater reported disability. Our hypothesis was supported in that the models significantly improved when pain catastrophizing and injury-related fear were added as predictors, when controlling for both instability and pain. Together, they accounted for an additional 16.5% and 16.2% of the variance in reported ankle function and disability, respectively, which highlights their importance to the models. The use of the FAM framework has garnered support across multiple musculoskeletal conditions,[27,28] including those with foot and/or ankle pain,[29] and overall, our results demonstrate relationships that are similar to the theoretical framework presented in the FAM, suggesting it may prove useful for continued study of these variables within ankle sprain populations. Many other theoretical models and frameworks have already been applied to the ankle sprain population. Interestingly, we believe our findings both support and add important insight in describing the relationships that exist between several of the sensory-perceptual alterations (pain, kinesiophobia, perceived instability, perceived ankle function, and perceived disability) proposed in the most updated model for CAI,[5] while also providing support to the perceptual-interdependence framework.[30] The perceptual-interdependence framework describes a nested relationship of perceptual alterations after ankle sprain that span from the cellular (pain and inflammation) to societal level (activity participation).[30] Like the FAM, both theoretical proposals describe the likely importance of the relationship between the sensory-perceptual alterations and movement and activity behavior changes associated with CAI. Our findings suggest pain, high levels of perceived instability, and injury-related fear reduces one's perceived level of ankle function during activity which could likely promote activity avoidance behaviors. Overtime, these avoidant behaviors may lead to neural adaptations that further promote avoidance and lead to movement-behavior impairments described in the CAI population, such as poor balance and movement pattern alterations, as well as lower levels of physical activity. Overall, continued pursuit of understanding the role of persistent pain and cognitive-affective factors, such as pain catastrophizing and injury-related fear, on the development and continuance of CAI and its associated impairments is warranted. Additionally, investigating intervention strategies that mitigate persistent pain and lower injury-related fear would likely assist in improving function and disability.

Pain is often lumped in as a solely physical symptom; however, it is well-established that pain – specifically persisting or recurring pain - is a multidimensional experience influenced by many factors.[31] So although interventions specific to pain in the ankle sprain populations are warranted, our results also support a multidimensional approach to rehabilitation. Psychologically informed intervention strategies may assist in the efficacy of reducing pain by targeting the interrelated cognitive-affective factors such as injury-related fear. Common psychological frameworks incorporated into rehabilitation protocols include education, imagery, self-talk or reframing, graded exposure, social support strategies, goal setting, and relaxation.[12] More work is needed to investigate the application of psychologically informed practice in sport injury and specifically ankle sprain populations; however, the literature is promising for the benefits that it can have in individuals following injury.[32,33]

Limitations

This study is not without limitations which should be considered when interpretating our results. The biggest limitation is that due to the cross-sectional design, we cannot infer causality. Further, all our participants were individuals with CAI which limits our ability to determine the predictive utility of these variables in the development of the condition. Future research could perform prospective analyses measuring these variables overtime and determine their use in predicting CAI and its associated impairments.

Another potential limitation to note is the relatively low scores reported on the PCS instrument by our participants. To our knowledge we are the first to report PCS scores in highly active individuals with CAI, and although our mean results are similar to recent findings in athletes, these low scores may be driving the relationship between it and the other variables within our study. As it is still unclear what threshold values are clinically meaningful to athletic populations and to those who develop CAI, future research investigating clinically meaningful cut-off scores may be relevant.

Another limitation of our study is that there was still approximately 50% of the variance that was not explained by our variables. Due to institutional COVID-19 research restrictions that prohibited in-person data collection, only patient-reported outcomes were used and limited the availability of clinician-rated measures. For example, balance performance is established in the CAI literature as an important variable related to reported function and disability, and likely another variable that could help to inform our models. This and other established clinician-rated variables may be considered in future investigations.

Lastly, we recognize there are inherent limitations when using self-report outcomes measures that can include memory and recall bias and can play a role in skewing the data collected and used within our models. Despite the limitations, we do believe that our study lends support for the FAM model being an important consideration to the CAI population.

Conclusions

Our study examined the influence of perceived instability, pain, pain catastrophizing, and injury-related fear on reported ankle function and disability in individuals with CAI. All these variables were found to serve as predictors of function and disability, which continues to support the notion that the condition is multifactorial and that these variables are important for clinicians to consider when examining or treating an individual after ankle sprain(s). Our design limitations further warrant investigations focused on the role these variables play in the transition from an acute ankle sprain to CAI, and how these variables may relate to other known impairments within these populations.

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Table 1. Participant demographics and patient-reported outcome data

Demographic or Outcome	n (%) or mean (SD)
Gender Identity	n = 126
Male	17 (13.49%)
Female	107 (84.92%)
Other*	1 (0.79%)
Prefer not to specify	1 (0.79%)
Age	32.69 (4.38)
Physical Activity Score**	n = 126
1	5 (3.97%)
2	11 (8.73%)
3	17 (13.49%)
4	45 (35.71%)
5	48 (38.10%)
IdFAI	17.31 (4.90)
Pain Presence	n = 126
No Pain	44 (34.92%)
Pain	82 (65.08%)
Pain Catastrophizing Scale	7.32 (7.46)
Helplessness	2.30 (2.94)
Magnification	2.16 (2.25)
Rumination	2.87 (3.12)
TSK-11	21.36 (5.53)
Quick-FAAM	83.22 (14.95)
mDPA	10.50 (10.67)
Physical	8.68 (8.87)
Mental	1.82 (2.85)

*Participant identified as non-binary **As described by Jurca et al[24] 1: Inactive or little activity other than usual daily activity; 2: Regular (≥5 days/week) low level exertion >10 minutes at a time; 3: Aerobic exercise, vigorous sport, or similar exertion for 20-60 minutes/week; 4: Aerobic exercise, vigorous sport, or similar exertion for 1-3 hours/week; 5: Aerobic exercise, vigorous sport, or similar exertion for over 3 hours/week

Table 2. Perceived instability and pain as predictors of function

Model		*b* (95% BCa CI)	SE *B*	β	*P* value
1	(Constant)	108.778 (101.081, 116.909)	3.764		.001*
	IdFAI	-1.477 (-1.904, -1.044)	.223	-.484	.001*
2	(Constant)	107.066 (100.162, 114.319)	3.405		.001*
	IdFAI	-.979 (-1.450, -.527)	.233	-.321	.001*
	Pain Presence	-10.604 (-14.536, -6.257)	2.191	-.339	.001*

Confidence intervals, standard error, and significance are based on 1000 bootstrap samples *<0.001

Table 3. Perceived instability and pain as predictors of disability

Model		*b* (95% BCa CI)	SE *B*	β	*P* value
1	(Constant)	-6.876 (-12.152, -1.099)	2.932		.022
	IdFAI	1.004 (.644, 1.353)	.183	.463	.001*
2	(Constant)	-5.830 (-11.175, -2.56)	2.920		.046
	IdFAI	.700 (.316, 1.103)	.213	.322	.003
	Pain Presence	6.482 (2.929, 10.242)	1.883	.292	.002

Confidence intervals, standard error, and significance are based on 1000 bootstrap samples *<0.001

Table 4. Perceived instability, pain, and cognitive-affective variables as predictors of function

Model		*b* (95% BCa CI)	SE *B*	β	*P* value
2	(Constant)	120.620 (112.037, 129.231)	4.515		.001*
	IdFAI	-.650 (-1.104, -.216)	.230	-.213	.006
	Pain Presence	-10.045 (-13.664, -6.072)	2.023	-.322	.001*
	PCS	-.393 (-.714, -.095)	.163	-.196	.016
	TSK	-.783 (-1.182, -.375)	.210	-.290	.001*

Confidence intervals, standard error, and significance are based on 1000 bootstrap samples *<0.001

Table 5. Perceived instability, pain, and cognitive-affective variables as predictors of function

Model		*b* (95% BCa CI)	SE *B*	β	*P* value
2	Constant	-14.152 (-20.570, -7.159)	3.355		.001*
	IdFAI	.475 (.083, .890)	.206	.219	.026
	Pain Presence	6.169 (2.660, 9.247)	1.644	.278	.001*
	PCS	.346 (.098, .585)	.120	.243	.003
	TSK	.463 (.167, .743)	.147	.241	.002

Confidence intervals, standard error, and significance are based on 1000 bootstrap samples *<0.001