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ORIGINAL RESEARCH

Understanding Injury-Related Fear in Individuals with Chronic Ankle Instability: A Qualitative Approach

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Context: The Tampa Scale of Kinesiophobia (TSK-11) is used to identify injury-related fear (IR-Fear) in individuals with chronic ankle instability (CAI) and is a predictor of poor health outcomes. Limited knowledge beyond quantitative scores necessitates a deeper, qualitative understanding of IR-Fear to reduce the burden of fear within CAI patients.

Objective: To explore the perceptions and experiences that influence IR-Fear within the CAI population.

Design: Consensual qualitative research.

Setting: Individual semistructured video conference interviews.

Patients or Other Participants: Nine participants with CAI were selected as a follow-up from a web-based questionnaire investigating the fear-avoidance model. Potential participants were contacted based on highest reported agreement with TSK-11 fear-belief statements.

Data Collection and Analysis: We conducted semistructured interviews via Zoom (Zoom Video Communications). Our research team used a consensual qualitative research data analysis process to create a consensual codebook. Multiple researchers, an external auditor, and member checks were used to ensure trustworthiness.

Results: We identified 2 major themes: (1) perceptions and influence of pain and IR-Fear and (2) assessment of their condition. Participants described individualized experiences and activities related to the cause of their pain and fear, severity and consequences of pain and injury, and adapting their activities due to their concerns for their ankle. Participants self-assessed their injuries, current condition, and care strategies. Participants described positive and negative interactions with others, including health care providers, coaches, family, and peers. Though participants shared how CAI affects their lives negatively, they all shared a generally positive outlook regarding their condition.

Conclusions: Individualized experiences shaped how IR-Fear affected activity behaviors and quality of life in individuals with CAI. Understanding these individualized aspects would be valuable for clinicians to choose appropriate strategies for reducing the burden of IR-Fear. Additionally, clinicians may find the TSK-11 a helpful discussion tool to understand these individual patient differences.

Key Words: Kinesiophobia, ankle sprain, patient-reported outcomes

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KEY POINTS

- Individuals' unique pain and injury experiences likely contribute to their fear perceptions, behavioral responses, and overall quality of life differently.
- Patients' injury and pain experiences, perceived susceptibility and severity of injury beliefs, and perceived risk or fear of harm during specific tasks/activities are important aspects to understanding their injury-related fear.
- Psychologically informed practice strategies are likely critical supplemental components for creating individualized care plans to address injury-related fear in patients with chronic ankle instability.

INTRODUCTION

Chronic ankle instability (CAI) is estimated to affect 40% of patients who suffer a lateral ankle sprain.[1] Chronic ankle instability is characterized by recurrent instability episodes, which may result in recurrent sprains and/or ongoing feelings of ankle instability.[2] Continuous bouts or feelings of ankle instability often result in challenges to physical function, movement, and activity and are well established in the literature.[3] Recent evidence supports that individuals with CAI also report heightened levels of injury-related fear.[4] Injury-related fear is an umbrella term that includes but is not limited to kinesiophobia and fear-avoidance beliefs,[5] and likely develops from memories of the pain and discomfort suffered after injury.[6] The most common element of injury-related fear studied in the CAI population is kinesiophobia, or fear beliefs regarding movements that the individual feels may make them vulnerable to pain and (re)injury.[7] Considering that individuals with CAI often experience multiple ankle injuries or continually experience bouts of ankle instability that could cause reinjury during movement and activity, it is not surprising that these patients report experiencing fears regarding reinjury.

Kinesiophobia is a barrier to rehabilitation and is associated with pain, disability, and low quality-of-life outcomes in other musculoskeletal conditions.[8] Kinesiophobia is also predictive of function and disability ratings in individuals with CAI, suggesting it is an important variable to the condition.[9] Some evidence has suggested that rehabilitation and multimodal interventions can improve reported fear beliefs in individuals with CAI,[10,11] but the presence of these fears may also require more specific treatment approaches focused on modifying fear beliefs and their subsequent behavioral consequences.[12] Unfortunately, current knowledge regarding kinesiophobia in the CAI population is in the form of quantitative scores, limiting our understanding of fear beyond its existence. Investigating injury-related fear through a qualitative lens is therefore warranted, as this deeper understanding of patients' fears enhances the clinicians' ability to create appropriate intervention strategies to reduce the burden of kinesiophobia in CAI patients.

Patient-reported outcomes (PROs) offer a standardized approach to measure psychological constructs such as injury-related fear. The Tampa Scale of Kinesiophobia (TSK-11) is most commonly used to assess levels of kinesiophobia in musculoskeletal conditions, including patients with CAI.[7] Patient-reported outcomes like the TSK serve a significant role in identifying this dimension of health and are imperative for tracking changes to the dimension throughout treatment and rehabilitation. However, PROs should be used by clinicians and researchers beyond the quantitative data they provide, as a total score does not necessarily give the clinician a clear understanding of patient-specific fear beliefs. For example, a patient could disagree with all 11 items on the TSK-11, yielding a total score of 22. In contrast, another patient may indicate agreement with 5 of 11 items and strongly disagree with the remaining 6, producing an overall score of 21. If comparing scores only, these patients would look quite similar, and one would even consider patient 1, with a score of 22, to have higher levels of fear compared with patient 2 (with a score of 21). However, patient 2 would have a greater display of specific fear beliefs despite a slightly lower overall score. Therefore, when creating individualized interventions, the clinician must look beyond the overall score and address each item individually. Discussing the elements of the PRO with patients allows for a qualitative understanding of the experiences and/or factors that underlie the scores and could ultimately lead to the ability to address them within the intervention if necessary.

At this point in the CAI literature, it is unknown if all individuals with CAI who present with greater levels of fear demonstrated by higher TSK scores have similar experiences regarding fears of movement and reinjury or if there is vast variation in experiences. Further, although CAI is known to be a heterogeneous condition, it is also unknown if there are commonalities in the fear beliefs held by individuals with CAI that are specifically related to the condition that may not be gleaned from PRO scores alone. Therefore, our purpose was to explore the perceptions and experiences that influence injury-related fear, measured with the TSK-11, within the CAI population.

METHODS

The Old Dominion University Health Sciences Human Subjects Review Committee approved this study as exempt research in December 2020 as a secondary analysis to a larger web-based survey investigating the use of the fear-avoidance model as a framework for CAI.[9] We used the survey as a recruitment platform for this study, to confirm consent to participate, determine CAI eligibility, and collect the TSK-11 data.[2] Our priority for this portion of the study was exploration of injury-related fear via the TSK-11. We used a consensual qualitative research (CQR) approach to explore individuals' experiences and perceptions underlying their agreement with TSK-11 items.[13] Consensual qualitative research includes aspects of grounded theory,[14] phenomenology,[15] and comprehensive process analysis[16] and

Table 1. Participant Characteristics and Patient-Reported Outcome Data

Participant Pseudonym	Gender Identity	Age, y	Physical Activity Score[a]	% of Agreement on TSK-11	Statements Agreed With	TSK-11 Score
Jessica	Female	30	2	81.82	1, 3, 4, 6–11	31
Melissa	Female	35	4	63.64	1, 4–7, 9, 11	31
Luke	Male	23	4	54.55	1, 2, 6, 7, 9, 11	29
Elizabeth	Female	30	5	45.45	1, 2, 5, 7, 11	26
Megan	Female	29	3	45.45	2, 7, 8, 9, 11	24
Sarah	Female	35	4	45.45	1, 3, 4, 7, 11	27
Amber	Female	33	4	45.45	1–3, 7, 10	26
Tiffany	Female	31	4	36.36	5–7, 9	22
Phil	Male	33	3	36.36	6, 7, 9, 11	22

Abbreviation: TSK-11, Tampa Scale of Kinesiophobia.

[a] Physical activity score: 2, regular (≥5 days/week) low-level exertion >10 minutes at a time; 3, aerobic exercise, vigorous sport, or similar exertion for 20–60 min/wk; 4, aerobic exercise, vigorous sport, or similar exertion for 1–3 h/wk; 5, aerobic exercise, vigorous sport, or similar exertion for over 3 h/wk. As described by Jurca et al.[17]

focuses on consistent data collection strategies and diverse teams to reduce bias.[13]

Sixty-one individuals with CAI completed the survey, indicated interest in participating in qualitative interviews, and were considered potential participants for this study. Our potential participants' TSK-11 data were exported and reviewed, and we calculated a percentage of agreement with the fear-belief statements. To do this, we determined the number of fear-belief statements each participant agreed with (represented by a score of 3 or 4), divided this number by 11 (the total number of fear-belief statements), and transformed it into a percentage. Percentages for all potential participants ranged from 81.8% to 0.0% agreement. We then contacted participants using purposive sampling, starting with the participants reporting the highest percentages of agreement. We used this instead of the total score due to the issues with total-score interpretations noted in the introduction and to capture perceptions for as many fear-belief statements as possible. The primary researcher (A.S.) contacted potential participants via email over a 1-month period using data saturation to guide this process. The exploratory nature of CQR suggests 8 to 15 participants are needed to achieve data saturation, and for our study, we determined saturation after 9 participant interviews (Table 1).[13]

Instrumentation

The primary researcher (A.S.) created a semistructured interview guide containing open-ended questions to explore participants' reasoning behind their agreement level with the fear-belief statements on the TSK-11. The TSK-11 has 11 fear-belief statements with a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*), yielding a total score between 11 and 44, with higher scores indicating higher levels of fear related to movement and reinjury.[7] Each participant's interview guide, specifically the direction of the questions they received, was predetermined based on their reported level of agreement with each of the TSK-11 statements collected during the survey portion of the study (Table 1). Because the interview guide was created from the validated TSK-11 statements, and the questions did not deviate from the scale, it was determined that external review was not necessary. However, the remaining research team members conducted internal content validation by reviewing the interview guide for clarity and consistency with our study goals and objectives, and we successfully piloted the final interview guide without any further changes (Table 2). The individual who completed the pilot interview was part of the initial participant pool; however, due to his low agreement percentage on the TSK-11 and our purposive sampling strategy, he was not one of our included participants.

The primary researcher (A.S.) conducted all interviews virtually (Zoom Video Communications) to provide consistency and credibility for data collection. Each participant consented verbally to have their interview recorded and automatically transcribed by Zoom services, and all interviews lasted between 35 and 60 minutes. After each interview, the primary researcher reviewed the transcripts and audio recordings to correct transcription errors, then sent deidentified transcripts back to participants, who were allowed 1 week to perform member checking to enhance the trustworthiness of the data. If the participant did not respond within a week, we used the transcript as it was, and of the participants who did respond, all felt the transcripts accurately described their perceptions and experiences.

Data Analysis

The CQR approach suggests forming a diverse research team to provide multiple perspectives and mitigate bias within individual team members.[13] Three of the authors (A.S., J.C., R.M.) with varying levels of clinical and research area expertise and backgrounds composed the primary research team for this analysis. An individual (not an author) with extensive CQR experience served as the external auditor to ensure the data were represented appropriately and accurately by the primary research team.

Consensual qualitative research involves a multistep consensual data analysis to provide credibility throughout this process. All research team members reviewed the first 3 transcripts to return from member checking to begin identifying core ideas. Once each member completed this step, we met to discuss our independent analyses and began constructing the initial codebook. Each researcher then used this initial codebook to code 1 of the originally reviewed

Table 2. Semistructured Interview Guide

Tampa Scale of Kinesiophobia Belief Statement	Strongly Agree/Agree Questions and Probes	Disagree/Strongly Disagree Questions and Probes
You indicated that you (level of agreement) with the statement. . .		
1. "I am afraid that I might injure myself if I exercise. . ."	Can you describe why you are fearful of reinjury to your ankle during exercise. • Probe: Can you identify any specific activities that are particularly concerning and why? • Probe: How has this fear affected your ability to exercise?	Why do you think you are able to exercise without fear of reinjury despite your ankle instabilities?
2. "If I were to try to overcome it, my pain would increase. . ."	Why do you believe your pain would increase if you try to overcome your ankle injury/instability? • Probe: How does this belief impact your life and activity participation?	Can you please expand on why you disagree with this?
3. "My body is telling me I have something dangerously wrong. . ."	Can you explain what your body is telling you and why you think it is dangerous?	Can you describe how you know you don't have something dangerously wrong?
4. "People aren't taking my medical condition seriously enough. . ."	Can you explain why you feel people aren't taking your ankle condition seriously enough?	What have people done to relay that they take your ankle condition seriously?
5. "My injury has put my body at risk for the rest of my life. . ."	Please explain how you feel your ankle injury has increased your risk and how it affects your life.	Can you please expand on why you disagree with this statement.
6. "Pain always means I have injured my body. . ."	Describe how you know that pain always means you have injured your body.	If you are not using pain as an indicator of an injury, tell us how you know that you have injured your body.
7. "Simply being careful that I do not make any unnecessary movements is the safest thing I can do to prevent my injury from worsening. . ."	Why do you think that being careful to avoid making unnecessary movements is the safest thing to prevent your injury from worsening? • Probe: What movements would you consider "unnecessary" and therefore try to avoid?	What do you feel is the safest thing you can do to prevent your injury from worsening?
8. "I wouldn't have this much pain if there wasn't something potentially dangerous going on in my body. . ."	Can you explain your pain level/intensity and why you think it is dangerous?	Can you describe any pain that you are having, and how you know that it is not dangerous? • Probe: If you don't have pain—does the absence of pain indicate that nothing is wrong in your body? Why or why not?
9. "Pain lets me know when to stop exercising so that I don't injure myself. . ."	Describe the specific characteristics of pain (type, level, location) that would alert you to stop exercising. • Probe: Why do you feel that stopping the activity would prevent you from injuring yourself?	Tell me why pain would not alert you to stop exercising. • Probe: What would be an indicator to you that you should stop exercising to prevent injury, if anything?

Table 2. Continued

Tampa Scale of Kinesiophobia Belief Statement	Strongly Agree/Agree Questions and Probes	Disagree/Strongly Disagree Questions and Probes
10. "I can't do all the things normal people do because it's easy for me to get injured. . ."	Why do you feel you are more susceptible to injury than others? What types of things are you limiting based on this belief? How does that make you feel?	Can you please expand on why you disagree with this?
11. "No one should have to exercise when he/she is in pain. . ."	Why do you believe pain should be a limiting factor to participating in exercise? • Probe: Do you avoid any exercise or activity because of actual or anticipated pain?	Why do you believe pain should not be a limiting factor to participating in exercise?

transcripts and 2 new transcripts to continue refining the codebook by specifically identifying themes and subthemes. We could not reach full consensus at this point, so we performed another round of coding using the refined codebook on 1 of the original transcripts and 2 new transcripts, resulting in consensus of the final codebook. At this point, we confirmed data saturation. Each researcher then coded all transcripts using the final codebook and met over a month to discuss and reach a consensus on all coded transcripts and ensure no new data needed to be collected.[13] After this step, we contacted the external auditor, and she examined 2 fully coded transcripts and the final consensus codebook with all coded quotes. The auditor included minor feedback regarding naming categories and themes and suggested we collapse our third theme into another to better represent the participant's voice. Lastly, we established the frequency of data presented in each theme (Table 3).

RESULTS

Data from 9 participants with CAI were available for data analysis (Table 1). Seven of our 9 participants identified as female, whereas the remaining 2 identified as male. Participants' ages ranged from 23 to 35 years, with an average age of 31 years. All our participants reported regular participation in physical activity ranging from low to high exertion, with level 4 (aerobic exercise for 1–3 h/wk) as the most reported activity level.[17] Our participants' TSK-11 scores ranged from 22 to 31, with an average score of 26.4. These scores yielded a range of agreement percentages from 36.36% to 81.82%, for an average of 50.5% agreement.

We identified 2 major themes from the interview data: perceptions and influence of pain and injury-related fear, and assessment of their condition (Table 3). These themes and related subthemes are represented by supporting quotes from our participants.

Perceptions and Influence of Pain and Injury-Related Fear

Three categories emerged from the interviews regarding perceptions and influences of pain and injury-related fear: cause of pain and fear, severity of pain and injury, and behavioral response. All participants were represented within each category. Small supporting quotes and a narrative summary of each category are below. Table 4 contains additional supporting quotes by participants, as referenced below.

Cause of Pain and Fear. Six of 9 participants had indicated on the TSK that they feared injuring their ankle during exercise (Table 1; question 1). However, during the interviews, all 9 participants identified that they did have concerns about reinjuring themselves or experiencing instability or pain in their involved ankle during certain activities. Four participants, including Melissa, described single past experiences of pain and injury that were perceived as severe or stressful and served as an anchor for their fears. The other 2 who specifically reported a fear of reinjury while exercising described experiencing more regular instances of pain, instability, and/or injury. Jessica stated, "I just know how frequently and how easy it happens." Others echoed a similar sentiment in that they often felt vulnerable or susceptible to pain and

Table 3. Frequencies of Themes, Categories, and Subthemes

Theme	Category and Subtheme	Frequency of Code Use	No. of Participant Cases
Perceptions and influence of pain and injury-related fear	Cause of pain and fear	124	9
	Severity of pain and injury	91	9
	Pain statements	54	9
	Consequences of pain and injury	37	9
	Behavioral response	166	9
	Activity alteration	136	9
	Planning behavior	30	8
Assessment of their condition	Self-assessment	160	9
	Response from others	32	9
	Positive outlook	118	9

injury during exercise because of their instability or ankle sprain history. Megan described:

> *I know that my ankle is not as stable as other people's because, like, I can bend it in really weird ways that other people are like you shouldn't be able to do that so I'm afraid that, like because of that, even though it doesn't hurt that it would go to a point where would get hurt. Because it doesn't have those like things that are supposed to keep it in place.*

Our participants described their injury-related fear and pain experiences as task- or activity-specific and not necessarily generalized to all exercises or movements. All participants expressed various activities associated with actual or anticipated pain and/or injury. Eight participants described functional activities such as jumping, landing, direction change, or single-leg activities as concerning. Sarah stated her concerns with jumping and landing: "I guess again going back to like a jumping movement. I feel very unstable and like it would be really easy for me to roll my ankle doing such a thing." Our male participants described that the jumping and landing task was not worrisome; specifically, performing jumping and landing tasks near others was their leading cause of concern.

All 9 participants described running or hiking as other physical activities in which they experienced pain or anticipated pain and injury. Amber described having concerns when hiking, "because usually I roll my ankle at least twice, while I'm hiking. It happens and I'm gonna fall at some point." Specifically noted to be reason for pain or fear during these activities seemed to be the increased risk of injury on uneven terrain, as Tiffany described, "I know that's [running on uneven terrain] when it is most likely going to happen the most or has like the highest risk versus just running on like the road or sidewalk, or something," and the length of the run, as Amber stated, "[Um] typically it's only for the long run, so usually I can run 1 to 5 miles and be fine but anything after that it hurts…"

As for daily activities that were mentioned as cause of pain or fear, participants mostly described walking or standing for long periods of time or walking while navigating uneven or unpredictable terrain.

Severity of Pain and Injury. Participants' pain and injury perceptions and behaviors were not only expressed as fear that they could or did experience pain and/or injury; they also discussed perceived levels of severity in relation to pain and injury. Subthemes identified in this category were pain statements and consequences of pain and injury.

The threat value one gives to pain is inherently woven into the kinesiophobia construct, and thus was at the center of some of our interview questions. However, as pain is subjective to one's own experience, it is hard to discern an individual's true beliefs, so we coded statements that were related to pain as "pain statements" and included them, as they likely informed participants' perceptions and behaviors regarding injury and fear of injury. Pain statements made by participants included pain as a symptom or signal of injury. Jessica stated, "I just feel like in the back of your head, pain is a way of telling your body that something is wrong. I think that's what I've been drilled from such an early age…" Others, like Elizabeth, described experiences or knowledge regarding varying pain levels, and how pain may not always equate to an injury:

> *Pain is definitely used as an indicator [of injury] at times, but there's also just naturally, your body will feel pain sensation when you're doing something strenuous… I can have ankle pain and not have what I think is an injury …in an alignment sense I can have pain with that but it not be something I need to do anything about… I feel like working out is painful, but it's not like I'm hurt.*

Pain statements made by our participants also spoke to how pain is one piece of information that they use to guide their activity and movement decisions. Luke said, "It's [pain] a very good indicator to stop because, number 1, you could further complicate whatever is happening." Pain statements reflected the subjective nature of pain among individuals, as described by Tiffany:

> *It depends on like the level of soreness I guess you could say. Like you know if it's like a 1 or 2 like mild soreness, then I would probably just push through it and run, but if it was like higher you know, like maybe—4 or 5 soreness I may like just limit what I'm doing or do something else cardio-wise instead…Like I said, I think it's more based on the pain. Obviously soreness versus like a sharp pain, then I would probably stop what I was doing if that happened during that activity, then I would, you know, stop just because that's not a normal pain that I typically feel in the ankle.*

Participants also perceived the severity of pain and injury by describing the consequences of ankle pain and injury. Often, these statements were related to why they were fearful of injury and/or given as reasoning for changing their activity

Table 4. Supporting Quotes for the First Theme: Perceptions and Influence of Pain and Injury-Related Fear

Category	Quote
Cause of pain and fear	I injured my ankle during exercise to begin with. In 2016 I injured my left ankle—so I've had ankle sprains throughout my life, but nothing to the magnitude I had in 2016. . .I stepped off a 20-inch box onto the ground in the middle of a workout and. . .I double-sprained my ankle with a grade 3 sprain on both sides tearing all ligaments, tendons, etc. . .I was on crutches for 7 weeks and a boot and during that time, I became pregnant. And because of. . .how your blood increases in volume when you're pregnant and being immobilized I developed blood clots and now I have lots of forever elements after this one simple injury. —Melissa
	Often during exercise I have instances where my ankles will roll unexpectedly, just in basic movements like a lot of side-to-side movements or any kind of uneven ground. . .as soon as there's like hills or trails or uneven pavement kind of in the mix then I, I think it's part of its worry and part of it just is I have like chronic weakness in my ankles. —Elizabeth
	There is pain associated with the instability moments, but it's because I roll my ankles when I'm doing a specific activity, so like general exercise activity, there's not [pain], but there's that risk of rolling. —Phil
	Rebounds with contenders. Okay, that's the main thing that I worry about just like jumping up with others and then landing in the same vicinity as them. —Luke
	And so, things like walking on uneven surfaces is something that just causes me to sprain my ankle. Here in Michigan, we have lots of uneven surfaces, especially in the wintertime when snow and just the sidewalk buckles or starts to crack. I literally just sprained my ankle walking down the driveway falling on a crack. . . I definitely like feel like my body tensing up when like it's slippery or when there's ice or something that um, it's there. —Jessica
	Walking. I have increased pain in terms of extensive walking. . . [when traveling] It gets stiff, and the stiffness causes discomfort. . . I would say the largest impact is when I'm doing like walking at Disney World, or walking at a fair, or walking at like hiking or anything that takes lots of. . .You know, it's lots of impact on the leg. —Melissa
	Like even sometimes walking, so, you know, when you, of course I'm at home, you know I mainly just wear tennis shoes and things like that, but it seems like when I go on vacations, especially in the summer it's warm you want to wear sandals things like that and not necessarily I don't—I never wear flip flops because I can't; but like say if I wanted to wear flat sandals or. . .I don't know what, Tom's or just anything like that I am scared because usually by the end of the day, my ankle and my foot starts hurting because where I'm flat-footed in that flat shoe so sometimes even walking sometimes it bothers it. —Amber
Severity of pain and injury: pain statements	I mean for the most part, it does [pain signals injury]. Obviously, pains can be good, too, but when it comes to, like, the ankle I feel like pain is not necessarily a good thing, just because that means something has been aggravated or pushed further than it should type thing. —Tiffany
	I think discomfort vs pain are 2 different things, and so, when you're like truly in pain [um] like it is your body like telling you that you need to stop doing whatever you're doing, I think that the way that we perceive discomfort sometimes makes us think that we're in pain and that's why we—Like some people will be like, Oh, this is painful, I have to stop that kind of thing so but like true genuine pain is our body like really telling us that like something is not right. . . —Megan

Table 4. Continued

Category	Quote
Severity of pain and injury: consequences of pain and injury	I think just knowing that like a more serious injury could come out of it. [Um] I have had some. . .other like calf injuries related to that same ankle, and I think it's always lateral calf, so I think something to do with like the muscle weakness in that ankle —Tiffany
	And so, whenever my—the ankle flares up, then I start having the pain, you know, on the top of my foot and it just throbs. And so, I kind of get that fear that, oh no is this going, is it going to turn into a stress fracture? Am I going to be [in] the boot? Am I going to not be able to move around for 6 weeks? So that's—I get that fear. —Amber
	Exercise is like a really big part of, not just like my life like something that I enjoy but, like, my mental health and so for me, I know, like if that was taken away from me for any part of time that it would really, really, really affect not just like, Oh, I might gain weight or anything like that, just like. It would affect my whole life. . .if I had a major ankle injury that surgery could be a possibility being booted could be a possibility and it's just one of those things where it's like you know. . ..even if it's a small chance [of] that possibly happening and taking all of those things away from me, even for a limited amount of time, it would like really derail those 6 to 8 weeks or whatever it was. —Megan
Behavioral response: activity alteration	I am more cautious in how I—how I do everything with that foot. —Melissa
	I mean because of knowing like how it happens, I think, just being cautious and you know careful and doing what I need to, to like not have it happen again type thing is probably, like I said, why you just want to be careful. —Tiffany
	The giving way or rolling your ankle. It's happened a lot I guess within just playing sport. . .So it's something that I look out for, or try to like avoid as much as possible. . . So with that, meaning like not trying to do those motions that put me in that situation. —Luke
	I would still engage in the exercise/sport, but not necessarily the movement. Or would like try to not put myself in that situation. [For example] So I just wouldn't go for rebounds as often as I would. —Luke
	When I'm doing lunges, you know, I really have to think about the way that I'm placing my foot down, you know and my ankle, because sometimes especially that right ankle—like if my leg is behind my body it wants to kind of roll to the side. So I just, you know, I think about things like that you know as far as making sure that my foot placement is where it needs to be, and that—you know, I have to make sure my knee and everything is in alignment, otherwise my ankle will compensate. Kind of the same way, probably like when I go hiking I do like shorter steps you know, so I like short quick steps, because that way I'm not on that one foot too long—that kind of thing. —Amber
	I really only pay attention when I'm like doing exercise, like if I was walking I don't really pay attention as much, but I think just exercise in general I just, if I'm running with no brace just I'll be like more cautious of the sidewalk like if there's raised or cracks or you know uneven surface there like I'll just be more cautious and try to pay attention, I guess, you could say to like my footing. —Tiffany
	. . .Like I still want to play and have fun, but like, I tone it back a little bit versus, you know, jumping as high as I can. Like I said, I love to play volleyball—I love to block, I love to spike, but there's just times, where it's just like because of that, I am not going to go all out because I would rather play next week also versus rolling my ankle and not being able to play, so I tend to have that guarded mentality just so I can continue to play, and do the things I like to do. So, I don't do it as hard as I would have if I was fearless in that and it's primarily because my ankles. —Phil

Table 4. Continued

Category	Quote
	I'm really careful and will modify, like, as soon as I read that other people were not actually hopping over their dumbbells, but like behind their dumbbells with like that visual of how high they have to go—I'm like, oh, I'm going to start doing that. So, I'll still do workouts, but maybe modify some certain aspects of it. —Sarah
Behavioral response: planning behavior	Like when I hike, I do pick trails that have either like, you know, more like round about. Or it's just like flat or I mean, or just say you and I were, I intentionally wear high shoes or high socks or stability for my ankles, because it's the right thing for me. —Elizabeth
	Or like if I'm going to try to run again a lot, I need to make sure that I have new shoes, and that I wear my ankle brace or ice right afterwards or do my like ankle stability exercises and things like that I guess. —Amber
	The easiest way to explain it is like running on the uneven terrain, like, I know I have to be careful, because even just walking that like —You don't know, like I said, roots or you know a little divot, so just being cautious of that and careful so that's why I just wear the brace to be like extra cautious. —Tiffany

behavior. Participants like Jessica described the consequences of injury regarding physical ailments: "But I think like when it happens, it's like a 10 like I am like in tears, ice, like all I can do is just lay down. All I do is think about it." Others, like Amber, described secondary issues that had followed injury or could arise. Participants also explained how an injury would affect their movement or activity, or as reasoning for why they changed their movement behavior, and how an injury would affect other aspects of their life:

> *Since I am married with 2 kids, I don't because of that. I don't want to roll my ankle and be out for work and we don't get paid—you get a couple weeks of PTO [paid time off] and that's it, so it's a lot of those things. —Phil*

Behavioral Response. All our participants described varying their activity behaviors based on their concerns regarding pain or their injury-related fears. Two subthemes emerged: activity alteration and planning behavior. Participants generally used terms like *cautious* or *careful* to describe their approach to activity and movement. For example, Jessica stated, "I think I'm more cautious about what it is that I'm going to be doing." Melissa shared a similar sentiment. Participants also shared that being cautious or careful was one way they felt they could avoid injury. Elizabeth stated, "I do find that I can totally avoid injury if I'm really careful with my movement."

Participants shared how they are cautious in different ways. All but 1 of our participants described simply avoiding movements or environments in which they feel susceptible to injury. Sarah stated, "I mean, again, there's things that I don't do because I want to avoid. Like, I won't jump very high, and I won't run." Amber also described her avoidance strategy:

> *Maybe if I'm walking and you need to you can either jump down, you know from where that is or you could do 5 other steps to move around that, I would always do the 5 other steps instead of like jumping down.*

Although our participants described avoiding specific tasks or movements, they shared that they did not often avoid activity altogether, but instead described modifying their activity or movements to continue to participate in a way that felt safe. Sarah stated, "Again, doing modifications to not completely stop the activity, but to do it in such a way that it's safer or at least feels safer." Our participants, such as Luke, said this sometimes meant changing how they play or participate. Others, like Amber, Tiffany, and Phil, described changing their awareness or focus of attention while performing the activity, their effort or intensity, or their activity volume. Participants also described this as modifying or exchanging the risky activity for something similar but with something the individual felt was less risky or with which they were more confident, as Megan stated: "I feel like I do like avoid some things like I'll choose different movements or things like that that I'm just like more comfortable with."

The second subtheme was related to planning behaviors. Participants shared that sometimes they used preemptive behaviors in anticipation of injury or the prevention of injury. Participants described planning their activities to avoid or prevent risk, ensuring they had the appropriate means for caring for an injury if one were to happen, and/or using specific footwear or bracing to feel safe. For example, Jessica said:

> *I think just picking out my outfit for the day. And what shoes I'm going to wear and things like that are all constantly in the back of my head. Um, making sure that I have ibuprofen in my car in case something happens.*

Assessment of Their Condition

Three categories emerged from the interviews regarding the assessment of their condition theme: self-assessment, response from others, and positive outlook. All participants were represented within each category. Small supporting quotes and a narrative summary of each category are found below. Table 5

Table 5. Supporting Quotes for the Second Theme: Assessment of Their Condition

Category	Quote
Self-assessment	The level of pain that I was in when the injury happened versus the level of pain that I feel on a more regular but still intermittent basis—they're just night and day, they're nowhere near the same threshold of pain. It was unbearable pain when the injury occurred and even through the first couple of weeks of recovery, to the point where I feel a little to no pain, unless I have overused it and, in that level of pain is still just pebbles compared to the mountain of pain that I felt. It's—It's just not comparable. —Melissa
	It's more annoying to me than anything, just because I feel like it's something that I'm have to deal with forever, so I don't think there is a quick fix for it, though, but so I think it's more—It just annoys me more than anything, and, of course, when it starts hurting a lot, then I think it's serious, but then other times I just kind of ignore it and think it'll be fine. I'll just do this or that, and you know it should get better. —Amber
	I don't have like mobility issues. . . overall, like, I feel like my life experience like when I go about my day to day is not like diminished by the pain level that I'm in or the, my mobility issues because of my ankle. —Megan
	So currently I have not done anything that makes me feel like I'm going to be impacted for my life, since I don't have chronic pain, or anything. As I said, it's more—has changed my lifestyle habits, but I don't think I've done it, I don't think so far, I don't think, yet it has caused anything that I'm like—Oh no, that's gonna affect me when I'm 70. I think there's back pain, there is that stuff that I'm more worried about than like the general instability of my ankle as an older individual. —Phil
	I mean, I would say it's a minor injury, it's nothing necessarily to, like, you know, have anyone hubbub about, um, yeah, minor. It's, um, it's a minor, minor thing. It's true. Like, you know, rest, ice, compression, whatever is usually enough to fix it. —Sarah
	Out of sight out of mind, I guess, I don't know, I mean, I know that there's always something wrong. Because I was thinking about that, I guess you always know there's something wrong, otherwise you wouldn't try to change your movements, you know, or think about your movements, I feel like if you didn't have any ankle problems you, you would never think about those things, so I guess I know there's always something wrong, but if it's not hurting me then I'm like that's okay today. —Amber
	They [my health care providers] made me rest, and so it got better at the time, so I felt like they listened to me. —Amber
	So I had seen 2 different offices that basically brushed it off as you'll be fine, this is no big deal [um] and then, finally, my own [primary care] doctor took it seriously. . .and then I could actually start seeing the correct type of orthopaedic doctor and get the services, I needed to recover. . .—Melissa
	I know my body and I know what usually happens after. . . usually getting off of it and resting it is something that helps me a lot. —Jessica
	I feel that a light ankle sprain a lot of times for myself actually improves with pushing through the little bit of the pain and kind of getting the blood flow and everything that—I've had better success through that. —Phil
	I was always one of those people that was like—I'm not—like PT doesn't work, I'm not going to do PT—that's ridiculous. And like I've been through PT now and I was like oh my gosh my—my ankle probably would have been so much better if I would have just done this in high school when I when I originally like hurt it. So it's, it's funny, they've always tried to like present the plan to me, it was me being a bad patient. —Megan
	I just think, from my experience, I've done plenty of ankle stabilization exercises that do help, and I've done. . . yeah mostly ankle stabilization type things/exercises—of the all the angles and doing the TheraBand—and I think that's helped, but it doesn't prevent the unloaded, or like the. . . If all those muscles aren't active at the same time, the joint's still loose. —Phil
Response from others	Anytime that I've had a sprain or like brought it up to a doctor, they were just like rest—like there was no real like—we should look into this. . . I would have to say that it's not being taken seriously. —Sarah

Table 5. Continued

Category	Quote
	I went to our urgent care, which is our walk-in for our doctor's practice, and they evaluated and slapped on this chintzy little boot that didn't do anything, it was awful, and they said, okay, by Monday you'll be fine. . .I went to the orthopaedic walk-in where they said okay, here's a more stabilizing boot, which is the one I wore for 7 weeks, and they said, "Here, some anti-inflammatories. In a week you'll be fine.". . .If it weren't for my primary doctor—forget the doctors who have actually seen my ankle, but if it weren't for her, she ordered an MRI and I got that done and then that's when we realized the extent of all the damage that had been done. —Melissa
	During high school. . .I was practicing, rolled one, like or you know sprained one and then like the very next day sprained other, so then the athletic trainer was like, well, you know, you need to do something about it, because obviously there's, a problem. . . then like after that we had to wear braces, like, playing basketball when I was on another team, and we had to do like. . .ankle stability exercises before practice and then wear our braces, so I think it was just like part of my whole high school career was just doing rehab to strengthen because the coaches knew the severity too of ankle sprain and loss of time, I think is what they were worried about from sport. —Tiffany
	My wife thinks I am a baby, when I roll my ankles she was like, you're fine—that type of thing. Like when I rolled it on the street and had like pretty solid swollen ankles she was just like, yeah. . . —Phil
Positive outlook	So I feel that I can do everything that someone with no injury can do. . . I would say, like people without ankle injuries. . . that's like who I'm comparing to—you know, like someone that doesn't have injuries that they have to worry about or pain type thing. —Tiffany
	I learned to like other types of exercise, like, even we got a peloton, like. . . That's no risk. —Elizabeth
	Hopping over a dumbbell, like, taking the dumbbell out of that equation makes it safer and I'm probably not jumping as high—but still getting cardio in so I think I'm still meeting an objective, but like taking a factor of it out that would make it dangerous to me. . .if the stimulus is to, like, you know, intend to be jumping and like increase your heart rate, I'm doing that. —Sarah
	I don't feel like I can't play with my kids or do my job effectively and for the most part, like the type of exercise that I choose to do I don't have issues with it, and again, some of that is just because, like, my goals are different. —Amber

Abbreviations: MRI, magnetic resonance imaging; PT, physical therapy.

contains additional supporting quotes by participants referenced below.

Self-Assessment. Participants shared their assessment of their injuries and current condition and their evaluation of the care strategies used on their involved ankle. Regarding their current condition, participants shared some ongoing symptoms like instability, pain, swelling, scar tissue, and their perceived function. For example, Melissa described, "I have very weak ankles, I have very limited calf mobility, now. I had better calf mobility before my injury. . ." and so, "I can't do the same level of movements that I did preinjury." Most participants, even when they disclosed having bouts of discomfort or pain, discounted it, as described by Megan:

> *I get really bad pains like through my ankle and then like into my foot kind of thing, and I know that, like. . . It's probably not like it's not like surgery required kind of thing but it's also one of those things where it's like [um] my ankle does not work, the same way that other people who maybe didn't have an injury.*

Participants typically described viewing CAI as annoying or something they must deal with when asked about the perceived level of seriousness of the condition or whether their ankle put them at risk for life. Phil said, "It's just annoying. It's an annoying, stupid thing that I have to deal with." However, generally, participants believed that their condition was not serious despite some of their ongoing issues:

> *I would say it's in the middle, it's, it's probably not serious. I would say closer to not serious. I mean, I do have, like, swelling, like always my ankles are swollen for life from injuries and crack—they crack constantly everywhere I walk—I like tiptoe around the baby's crib because they're like, they crack*

and I think that that's probably not like ideal, but it's not something that's going, doesn't. you know, day to day, it doesn't affect me and could it be better? Yes, but it could be super worse. —Elizabeth

Participants described the information that led them to believe that their condition was not serious—specifically citing pain, function, and life impact as ways they gauged the level of seriousness. Luke said, "The absence of pain indicates there's nothing wrong with my ankle and then that could also be seen through like, for the most part, my participation in activities, exercises." Megan and Phil described similar assessments. Tiffany described knowing that ankle instability may be more serious for others, but in her case, it was not, "So, like mine doesn't hinder me in any way really so like I don't necessarily think it's serious in my standpoint but, like in other people['s] standpoints, it could be serious, it could hinder them." Participants like Phil and Sarah also expressed that they used their ability to manage their condition to guide their judgment regarding the seriousness of their condition. Phil stated:

I think it's not very serious, as long as I choose activities. . . if I was doing everything without caution, it would be a lot more serious, but I think it's something that can be managed with the right amount of caution and choice of activities.

Participants also displayed some ambivalence in how they viewed their condition, its effects on their lives, and whether it could change. Amber described that because she did not have constant pain, she could put it out of her mind, although she admitted she still knows something is wrong. Jessica discussed how her instability had persisted despite her making efforts to change it: "I've done numerous things about it: PT [physical therapy], supports, and it's just constantly there." However, she later indicated that she was still hopeful that her condition could change:

I know that there are things that you can do to overcome it. And so I don't feel like for the rest of my life, I have to endure these things. I haven't had an ankle sprain, knock on wood, in quite a bit. And so, um, do I feel like it's something that it's going to inhibit me forever? Hopefully not. . . Yeah, so, I just, I don't feel like it's gonna affect me forever.

All participants described care strategies they used for their ankles and their assessment of these strategies. Some of these were self-driven, and some were related to care received from others. Participants revealed varying experiences and encounters with health care providers. Amber described a positive experience, whereas Melissa described how she had gone to multiple doctors before she felt like she received the appropriate care. Despite the variation in experiences, participants described the perceived benefit from either care received from others or self-driven care, though some discrepancies existed. For example, Jessica described rest as helpful after injury, whereas Phil described working through it as beneficial.

All the participants who described experiences with rehabilitation perceived them as beneficial. Megan specifically described how, after doing rehabilitation, she had wished she had done it sooner. Tiffany and Phil are both rehabilitation professionals, and both shared the perceived benefits of rehabilitation but also noted that it may not completely fix their instability.

Response from Others. Our participants often described interactions with others throughout their experiences, including health care providers, coaches, family, and peers, and shared their perceptions of others' responses regarding their injury or condition. These interactions likely informed their current perceptions regarding their injuries and condition.

Luke was the only participant we interviewed who did not seek care from a health care provider after his self-described worst ankle injury; he said, "I think it's like more of like, I don't want to do it [seek medical care] knowing that my parents could find out. . . they'll get mad." The other 8 participants described interacting with urgent care, primary care, or orthopaedic physicians; athletic trainers (ATs); and physical therapists. Participants expressed a variety of responses to their injuries, including imaging, immobilization, rest, and rehabilitation. Two of our participants also described other complaints that led them to pursuing rehabilitation, which led to focusing on their ankle:

My doctors were saying, that they believe that instability in my knee was because of the instability in my ankle and then I was like compensating for things so it [pursuing physical therapy] was kind of for both ankle and knee. —Megan

I actually went to see the physical therapist for my back. . .and he said, you know, because . . .everything's on the right side, I think that your—your back and your hip is bothering you because of your ankle instability, so this was before even I saw the sports medicine doctor, so he was kind of on it. And so, he kind of taught me some different exercises and so really me strengthening my, my hip and my glutes kind of helps my ankle more too. —Amber

One of the questions on the TSK-11 relates to how seriously the individual feels others are taking their injury or condition. Regarding health care providers, some participants, like Sarah, thought they did not take their ankle injuries seriously. Melissa also described how she interacted with 3 doctors before feeling that they took her injury seriously. On the other hand, Megan admitted that her doctors took her injury seriously, but that she did not: "Okay, so when I originally hurt it. . . they like were . . .I felt like I didn't take it as seriously as they did—and they were like we need to do PT, we need to do all this stuff." Regarding that specific question, participants also identified parents, coaches, and peers as "others." Tiffany described how her AT and coaches were responsive to her injuries and in preventing ankle injuries. Phil described how his coaches in high school also told him to "wear the braces and everything to make sure you're not. Same thing with like basketball, is wear the high tops and everything. . ." but perceived that this response was not serious: "I think they also interpreted as it's not that big of a deal, just do this to compensate for it or to adapt with it." Elizabeth mentioned receiving care from her AT, coaches, and others, and said, "I've never felt like people thought I was making it up or it wasn't a factor. . ." In contrast, Phil and Jessica shared similar responses from their family; Jessica said, "Like my family says, like, 'Oh, you did it again' type of thing."

Positive Outlook. Throughout our interviews, participants shared how CAI and their past ankle injuries affected their lives in negative ways. Despite this, individuals generally displayed attitudes and cognitions that gave them a positive

outlook on their condition. As mentioned, although participants did describe fears regarding specific movements and activities, it didn't stop them from remaining active. Sarah said, "I guess that kind of goes along with what I said about being stubborn and like still doing the workout anyway. Like, I guess I'm not so fearful of reinjury that I'm going to stop moving." All our participants, including Tiffany, described specific activities or tasks in which they felt confident in their abilities or overall ability, which may have assisted in maintaining regular activity. Two participants even described gaining confidence through practice and gradual exposure to activities previously associated with pain or fear:

> *So, I just. I use it more. I work out more regularly and that helps just keeping it moving better. I guess my confidence, the more I do the more confident I feel. . . you know a little bit at a time builds up to be a lot of time. —Melissa*

> *I think some of it was just like the gradual build up that I allowed myself to have so like allowing myself to go back to working with much lighter weights than maybe I knew I was capable of, and so like gradually building back up to it and, like being able to like expose myself to these things like repeatedly without pain um and then just knowing like if it did hurt, I was allowed to stop. Like I had already agreed ahead of time like if something hurts that I'm not continuing that—that helped a lot. —Megan*

Participants described having to adjust or alter their activities and often make modifications due to their ankles to continue to exercise. However, most participants, like Elizabeth and Sarah, were open to the idea of finding new ways to move and be active and didn't find that the modifications were inhibiting the intended goal of the activity. Finally, some participants, like Tiffany, described that they had come to accept their condition for what it was over time:

> *I would say it's just been something I've dealt with for a long time, so it doesn't like—if it rolls or anything like that it doesn't bother me like type thing. I just go on with what I'm doing because I might just be walking down the sidewalk and it could roll or you know running whichever so it's just part of life, type thing.*

Amber and Phil stated that due to their current priorities, goals, and values, their condition did not affect the quality of their life. Phil stated:

> *Just at this stage of my life. if you asked me 10 years ago, I would have a whole different story. . .there's things that I needed to accomplish back then, in my male ego that I. . . Now that I'm like—I'm in a different stage of life that those activities are not as important to me. . .Can I get up and down with my girls and can I hold them in my arms—those are the things I got to make sure I can still do.*

DISCUSSION

This study is the first to explore the injury-related fear construct in individuals with CAI using a systematic qualitative approach. We explored this by trying to understand the experiences and factors that patients used to assign their agreement level to the TSK-11 statements, as this is the most used PRO for assessing injury-related fear in this population. Our participants' levels of kinesiophobia, as measured by the TSK-11, were varied; however, all 9 participants described feeling concerned about their ankle experiencing instability or injury during certain activities. Our results revealed that although some similarities exist, everyone's unique experiences likely contribute to their fear perceptions, behavioral responses, and overall quality of life differently. Thus, an individualized care approach is likely necessary for both understanding and addressing injury-related fear in CAI patients. Additionally, clinicians may find it helpful to use an instrument, like the TSK-11, as a discussion tool to begin understanding patients' individualized experiences. Our results also point to some specific areas that may be useful for clinicians to discuss with their patients to understand factors influencing their injury-related fear and how it affects their activity and life, and can inform the best ways of addressing them. We will discuss each of these areas and provide potential psychologically informed techniques that can be integrated into typical athletic training practice based on current recommendations.[12]

Our results suggest that an ideal place to begin is understanding patients' injury, instability, and pain experiences. Injury can be a perceived stressor in an individual's life. After injury, multiple factors interact and result in the cognitive appraisals of the injury experience and affect the emotional response after injury—including the fear response.[18,19] One of these factors is related to the characteristics of the injury. Specific injury experiences that our participants mentioned that caused their injury-related fears were related to the perceived severity of the event or based on an increased frequency of instability, pain, and injury episodes to their involved ankle. This finding is similar to other studies that found that athletes who had experienced significant injuries requiring more time loss reported greater injury-related fear than athletes who had experienced minor injuries,[20] and athletes who had experienced multiple ankle sprains reported greater injury-related fear than athletes who had experienced one ankle sprain.[21] Clinicians' understanding of whether patients' fears anchor to one injury experience or are from ongoing instability and/or painful experiences would help identify the primary cause of their fear and how generalized it may be across tasks and activities.

Another factor known to increase stress after injury is a lack of support from others.[18,19,22] Some of our participants identified a lack of support during their past injury experiences as well, pointing to another critical area clinicians should discuss with their patients to understand the stress associated with these experiences. Although clinicians cannot change past experiences that may have caused or promoted the acquisition of injury-related fear in these patients, they may still be able to reduce the stress associated with the current condition by creating a strong therapeutic relationship through empathetic communication and collaboration.[12,23,24] Connectedness is a specific factor patients described as helping them manage their injury-related fear after anterior cruciate ligament reconstruction.[25] Patients described that support provided by rehabilitation providers made them feel valued and understood and that their rehabilitation was individualized to their specific needs.[25] Therefore, when working with patients with CAI, clinicians should aim to focus on empathetic interactions to be able to support and understand patients perspectives of pain and fear and then work collaboratively to use other appropriate strategies on an individualized basis.[24]

Once clinicians have created a trusting relationship and understand the potential stressors related to past and current injury experiences, our results suggest discussing the belief systems that may have formed regarding these situations.

Specifically, our participants described that their injury, instability, and pain experiences provided them with evidence that they were susceptible or vulnerable to pain and reinjury of their ankle and believed that future pain and injury would be associated with harm or unwanted consequences. Perceived susceptibility and severity are 2 specific factors that affect how an individual appraises a threat, with a more significant perceived threat of injury contributing to a greater level of fear regarding reinjury.[26,27] Therefore, clinicians should also gauge patients' beliefs regarding their susceptibility to ankle reinjury and perceived ramifications or harm associated with future injury, as these cognitions may underlie some behaviors related to their fear and may need to be challenged by the clinician during rehabilitation. One potential strategy that may be useful for altering cognitions and may also help alleviate the fear associated with threatening situations is imagery.[12,28] Of specific interest is the evidence that using imagery scripts producing a challenge-appraisal vs a threat-appraisal state during a stressful scenario may produce more positive interpretations and adaptive coping responses in athletes.[29] Perhaps similar strategies can be used in patients with CAI, using imagery to manipulate the threat-appraisal state during a situation in which they feel susceptible to reinjury by introducing scripts that promote challenge-appraisal states by enhancing their self-efficacy and control within the scenario.[29] Imagery and relaxation techniques have demonstrated effectiveness in improving outcomes after sport-related injuries and may be helpful strategies to use in patients with CAI reporting injury-related fears.[12,30–32]

Direct experiences of instability, pain, and injury also informed the tasks, activities, and situations that our participants identified as causes of fear and pain and subsequent avoidant behavior. This finding supports the notion that fear acquisition and learning develop via classical conditioning.[33] The mechanism of a lateral ankle sprain likely serves as a proprioceptive cue followed by pain and/or injury, causing the situation surrounding the injury experience to be associated with injury and pain. Thus, in any activity or environment where individuals experience subsequent feelings of their ankle giving way or pain, their body may associate these new movement experiences with pain and injury and learn to fear them. Direct experiences enhance fear learning,[33] which is why understanding actual experiences of pain, injury, and instability would undoubtedly be useful for beginning to identify the specific activities and movements patients have learned to fear based on these experiences. We also found that in some cases, participants identified activities or situations based on the anticipation of pain or injury without ever having directly experienced pain or injury during the activity. Evidence supports this idea, in that fear learning can generalize to situations that an individual perceives as similar to a learned fear situation, and so clinicians should aim to identify all situations their patient associates with pain or fear, regardless of past injury history.[34] Identifying feared activities can be accomplished in various ways, but in low back patients and patients who undergo anterior cruciate ligament reconstruction, Photographic Series of Daily Activities[35] and Photographic Series of Sports Activities[36] are helpful tools for patients to identify fear-invoking activities and sports situations. Future researchers could test the use of these tools or develop a specific photo series for the ankle sprain population, as this may help understand patients' situation-specific fears and can also be used to better inform individualized intervention strategies.

Based on our participants demonstrating situation-specific injury-related fear, another strategy that may be beneficial for reducing these fears in patients with CAI is graded exposure therapy.[12] Graded exposure therapy is individualized to the patient and combines cognitive and behavioral approaches with progressions in activity to build up activity tolerance.[37] The goal of this therapy comes from the fear extinction literature, which describes that exposure to the activity or movement without having the unconditioned stimulus, pain and injury in this case, leads to a dampening of the excitatory association by creating inhibitory associations that reduce fear and the generalization of fear.[33] Therefore, clinicians would include patients' feared movements and/or activities in these progressive rehabilitation programs to dissociate the previous relationships between the activity and injury, starting with the least feared.[37] Two of our participants specifically described gaining confidence in previously feared activities through progressive and gradual exposure to them and now being able to perform the activities without a problem. Although certainly limited, these 2 accounts support the idea that this may be a ripe area for exploring situation-specific fears in patients with CAI. Evidence supports that graded exposure can alleviate fears and increase patient function,[38–42] although maximized improvements occur when combined with other intervention strategies.[40,42] Education to alter pain and injury memories may be helpful in addition to graded exposure,[43] as well as other psychologically informed intervention strategies mentioned previously, like social support, imagery, and goal setting,[44] as these have independently helped relieve fears and anxieties and enhanced confidence.[12,45]

Lastly, our results also support understanding patients' values, goals, and perspectives towards activity. These will help shape the approach for their individualized care plans and are likely driving factors to how patients' fears and condition impact their physical activity and quality of life. Our results support that kinesiophobia did not apply to all physical activities,[43] as our participants maintained various physical activity levels despite reporting specific activity avoidance and alterations. However, almost all our participants shared that they did not mind having to make these changes. Furthermore, our participants reported that despite ongoing symptoms and issues associated with CAI, they perceived their condition as a minor annoyance and not impacting their overall quality of life. As Filbay et al described, some of our participants shared that it took time to accept their condition and the adaptations to their activity.[46] Sometimes, their perceptions of their condition changed as their life priorities, goals, and values changed. For example, a few of our participants stated that had we asked them the same questions a few years ago, they likely would have felt differently, but due to where they were now or their current goals, they had reached a level of acceptance. It is unknown if the positive outlook of our participants would be like that of patients with CAI who could not continue participating in activities of interest, were not open to other modalities of exercise, and could not accommodate their fears or reach a level of acceptance.

Individuals of similar age to our cohort who report lower activity levels due to their ankle may be especially important to investigate, as increased injury-related fear and lower physical activity levels are associated with ankle-joint degeneration in patients with CAI.[47] This also may suggest critical time points in the progression of CAI, which could benefit from strategies that reduce injury-related fear and participation in physical activity that maintains individuals' quality of life.

Limitations

Our study is not without limitations. One limitation is that we only used the TSK-11 to begin to explore one aspect of the injury-related fear construct (kinesiophobia) within the CAI population. We also relied on self-report measures and interviews to guide this study, which increases the potential for recall bias from our participants, which could affect their recollection of their injury experiences and memories. Additionally, using a qualitative design and small cohort does not allow for the generalizability of our findings to all patients suffering from CAI, or patient management in general. However, further investigations using themes identified within our study to continue to explore this construct within this population would help expand our knowledge on potential areas in which to intervene to best enhance continued physical activity and quality of life.

CONCLUSIONS

Our study emphasizes the importance of discussing patients' injury, instability, and pain experiences, as this can lead to a deeper understanding of their fear and may reveal specific areas to address within their care plan. Areas that could be specifically important to discuss are related to an individual's perceived susceptibility and severity of future injury and the perceived risk of injury associated with specific tasks and activities, as these may become feared activities that the patient begins to avoid. Patient values, goals, and perspectives towards activity may also help shape the impact of both injury-related fear and the condition of CAI on their quality of life.

REFERENCES

1. Doherty C, Delahunt E, Caulfield B, Hertel J, Ryan J, Bleakley C. The incidence and prevalence of ankle sprain injury: a systematic review and meta-analysis of prospective epidemiological studies. *Sports Med*. 2014;44(1):123–140. doi:10.1007/s40279-013-0102-5
2. Gribble PA, Delahunt E, Bleakley C, et al. Selection criteria for patients with chronic ankle instability in controlled research: a position statement of the International Ankle Consortium. *J Orthop Sports Phys Ther*. 2013;43(8):585–591. doi:10.2519/jospt.2013.0303
3. Hertel J, Corbett RO. An updated model of chronic ankle instability. *J Athl Train*. 2019;54(6):572–588. doi:10.4085/1062-6050-344-18
4. Suttmiller AMB, McCann RS. Injury-related fear in individuals with and without chronic ankle instability: a systematic review. *J Sport Rehabil*. 2021;30(8):1203–1212. doi:10.1123/jsr.2021-0015
5. Houston MN, Van Lunen BL, Hoch MC. Health-related quality of life in individuals with chronic ankle instability. *J Athl Train*. 2014;49(6):758–763. doi:10.4085/1062-6050-49.3.54
6. Moss RA, Slobounov S. Neural, behavioral and psychological effects of injury in athletes. In: Slobounov S, Sebastianelli W, eds. *Foundations of Sport-Related Brain Injuries*. Springer; 2006:407–430. doi:10.1007/0-387-32565-4_18
7. Woby SR, Roach NK, Urmston M, Watson PJ. Psychometric properties of the TSK-11: a shortened version of the Tampa Scale for Kinesiophobia. *Pain*. 2005;117(1–2):137–144. doi:10.1016/j.pain.2005.05.029
8. Luque-Suarez A, Martinez-Calderon J, Falla D. Role of kinesiophobia on pain, disability and quality of life in people suffering from chronic musculoskeletal pain: a systematic review. *Br J Sports Med*. 2019;53(9):554–559. doi:10.1136/bjsports-2017-098673
9. Suttmiller AMB, Cavallario JM, Baez SE, Martinez JC, McCann RS. Perceived instability, pain, and psychological factors for prediction of function and disability in individuals with chronic ankle instability. *J Athl Train*. 2022;57(11–12):1048–1054. doi:10.4085/1062-6050-0605.21
10. Powden CJ, Hoch JM, Jamali BE, Hoch MC. A 4-week multimodal intervention for individuals with chronic ankle instability: examination of disease-oriented and patient-oriented outcomes. *J Athl Train*. 2019;54(4):384–396. doi:10.4085/1062-6050-344-17
11. Hall EA, Chomistek AK, Kingma JJ, Docherty CL. Balance- and strength-training protocols to improve chronic ankle instability deficits, part II: assessing patient-reported outcome measures. *J Athl Train*. 2018;53(6):578–583. doi:10.4085/1062-6050-387-16
12. Baez S, Jochimsen K. Current clinical concepts: integration of psychologically informed practice for management of patients with sport-related injuries. *J Athl Train*. 2023;58(9):687–696. doi:10.4085/1062-6050-0556.22
13. Hill CE, Knox S, Thompson BJ, Williams EN, Hess SA, Ladany N. Consensual qualitative research: an update. *J Coun Psychol*. 2005;52(2):196–205. doi:10.1037/0022-0167.52.2.196
14. Corbin J, Strauss A. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. 4th edition. Sage Publications Inc; 2015.
15. Giorgi A, Giorgi B. Phenomenology. In: Smith JA, ed. *Qualitative Psychology: A Practical Guide to Research Methods*. Sage Publications Inc; 2003:25–50.
16. Elliott R. Comprehensive process analysis: understanding the change process in significant therapy events. In: Packer MJ, Addison RB, eds. *Entering the Circle: Hermeneutic Investigations in Psychology*. State University of New York Press; 1989:165–184.
17. Jurca R, Jackson AS, LaMonte MJ, et al. Assessing cardiorespiratory fitness without performing exercise testing. *Am J Prev Med*. 2005;29(3):185–193. doi:10.1016/j.amepre.2005.06.004
18. Williams JM, Andersen MB. Psychosocial antecedents of sport injury: review and critique of the stress and injury model. *J Applied Sport Psychol*. 1998;10(1):5–25. doi:10.1080/10413209808406375
19. Walker N, Thatcher J, Lavallee D. Psychological responses to injury in competitive sport: a critical review. *J R Soc Promot Health*. 2007;127(4):174–180. doi:10.1177/1466424007079494
20. Covassin T, McAJIister-Deitrick J, Bleecker A, Heiden EO, Yang J. Examining time-loss and fear of re-injury in athletes. *J Sport Behav*. 2015;38(4):394–403.
21. Houston MN, Hoch JM, Hoch MC. College athletes with ankle sprain history exhibit greater fear-avoidance beliefs. *J Sport Rehabil*. 2018;27(5):419–423. doi:10.1123/jsr.2017-0075
22. Wiese-Bjornstal DM, Smith AM, Shaffer SM, Morrey MA. An integrated model of response to sport injury: psychological and sociological dynamics. *J Applied Sport Psychol*. 1998;10(1):46–69. doi:10.1080/10413209808406377

23. Pomarensky M, Macedo L, Carlesso LC. Management of chronic musculoskeletal pain through a biopsychosocial lens. *J Athl Train*. 2022;57(4):312–318. doi:10.4085/1062-6050-0521.20
24. Linton SJ, O'Sullivan PB, Zetterberg HE, Vlaeyen JWS. The "future" pain clinician: competencies needed to provide psychologically informed care. *Scand J Pain*. 2024;24(1). doi:10.1515/sjpain-2024-0017
25. Mahood C, Perry M, Gallagher P, Sole G. Chaos and confusion with confidence: managing fear of re-injury after anterior cruciate ligament reconstruction. *Phys Ther Sport*. 2020;45:145–154. doi:10.1016/j.ptsp.2020.07.002
26. Witte K. Putting the fear back into fear appeals: the extended parallel process model. *Commun Monogr*. 1992;59(4):329–349. doi:10.1080/03637759209376276
27. Witte K, Allen M. A meta-analysis of fear appeals: implications for effective public health campaigns. *Health Educ Behav*. 2000;27(5):591–615. doi:10.1177/109019810002700506
28. Cumming J, Ramsey R. Imagery interventions in sport. In: Mellalieu S, Hanton S, eds. *Advances in Applied Sport Psychology: A Review*. Routledge; 2009:5–36.
29. Williams SE, Cumming J, Balanos GM. The use of imagery to manipulate challenge and threat appraisal states in athletes. *J Sport Exerc Psychol*. 2010;32(3):339–358. doi:10.1123/jsep.32.3.339
30. Bagheri S, Naderi A, Mirali S, Calmeiro L, Brewer BW. Adding mindfulness practice to exercise therapy for female recreational runners with patellofemoral pain: a randomized controlled trial. *J Athl Train*. 2021;56(8):902–911. doi:10.4085/1062-6050-0214.20
31. Cupal DD, Brewer BW. Effects of relaxation and guided imagery on knee strength, reinjury anxiety, and pain following anterior cruciate ligament reconstruction. *Rehabil Psychol*. 2001;46(1):28–43. doi:10.1037/0090-5550.46.1.28
32. Christakou A, Zervas Y, Lavallee D. The adjunctive role of imagery on the functional rehabilitation of a grade II ankle sprain. *Hum Mov Sci*. 2007;26(1):141–154. doi:10.1016/j.humov.2006.07.010
33. Vlaeyen JWS, Linton SJ. Fear-avoidance model of chronic musculoskeletal pain: 12 years on. *Pain*. 2012;153(6):1144–1147. doi:10.1016/j.pain.2011.12.009
34. Meulders A, Vandael K, Vlaeyen JWS. Generalization of pain-related fear based on conceptual knowledge. *Behav Ther*. 2017;48(3):295–310. doi:10.1016/j.beth.2016.11.014
35. Leeuw M, Goossens MEJB, van Breukelen GJP, Boersma K, Vlaeyen JWS. Measuring perceived harmfulness of physical activities in patients with chronic low back pain: the Photograph Series of Daily Activities—short electronic version. *J Pain*. 2007;8(11):840–849. doi:10.1016/j.jpain.2007.05.013
36. van Lankveld W, van Melick N, Habets B, Roelofsen E, Staal JB, van Cingel R. Measuring individual hierarchy of anxiety invoking sports related activities: development and validation of the Photographic Series of Sports Activities for Anterior Cruciate Ligament Reconstruction (PHOSA-ACLR). *BMC Musculoskelet Disord*. 2017;18(1):287. doi:10.1186/s12891-017-1643-9
37. Macedo LG, Smeets RJEM, Maher CG, Latimer J, McAuley JH. Graded activity and graded exposure for persistent nonspecific low back pain: a systematic review. *Phys Ther*. 2010;90(6):860–879. doi:10.2522/ptj.20090303
38. Woods MP, Asmundson GJG. Evaluating the efficacy of graded in vivo exposure for the treatment of fear in patients with chronic back pain: a randomized controlled clinical trial. *Pain*. 2008;136(3):271–280. doi:10.1016/j.pain.2007.06.037
39. de Jong JR, Vangronsveld K, Peters ML, et al. Reduction of pain-related fear and disability in post-traumatic neck pain: a replicated single-case experimental study of exposure in vivo. *J Pain*. 2008;9(12):1123–1134. doi:10.1016/j.jpain.2008.06.015
40. de Jong JR, Vlaeyen JWS, Onghena P, Goossens MEJB, Geilen M, Mulder H. Fear of movement/(re)injury in chronic low back pain: education or exposure in vivo as mediator to fear reduction? *Clin J Pain*. 2005;21(1):9–17; discussion 69–72. doi:10.1097/00002508-200501000-00002
41. Vlaeyen JWS, de Jong J, Geilen M, Heuts PHTG, van Breukelen G. The treatment of fear of movement/(re)injury in chronic low back pain: further evidence on the effectiveness of exposure in vivo. *Clin J Pain*. 2002;18(4):251–261. doi:10.1097/00002508-200207000-00006
42. Linton SJ, Boersma K, Jansson M, Overmeer T, Lindblom K, Vlaeyen JWS. A randomized controlled trial of exposure in vivo for patients with spinal pain reporting fear of work-related activities. *Eur J Pain*. 2008;12(6):722–730. doi:10.1016/j.ejpain.2007.11.001
43. Nijs J, Lluch Girbés E, Lundberg M, Malfliet A, Sterling M. Exercise therapy for chronic musculoskeletal pain: innovation by altering pain memories. *Man Ther*. 2015;20(1):216–220. doi:10.1016/j.math.2014.07.004
44. Brinkman C, Baez SE, Genoese F, Hoch JM. Use of goal setting to enhance self-efficacy after sports-related injury: a critically appraised topic. *J Sport Rehabil*. 2019;29(4):498–502. doi:10.1123/jsr.2019-0032
45. Hsu CJ, Meierbachtol A, George SZ, Chmielewski TL. Fear of reinjury in athletes. *Sports Health*. 2017;9(2):162–167. doi:10.1177/1941738116666813
46. Filbay SR, Crossley KM, Ackerman IN. Activity preferences, lifestyle modifications and re-injury fears influence longer-term quality of life in people with knee symptoms following anterior cruciate ligament reconstruction: a qualitative study. *J Physiother*. 2016;62(2):103–110. doi:10.1016/j.jphys.2016.02.011
47. Wikstrom EA, Song K, Casey M, et al. Ankle cartilage composition associates with physical activity and fear-avoidance in those with chronic ankle instability. *J Athl Train*. 2019;54(6S):S-45. doi:10.4085/1062-6050-54.6s.S-1