JOSPT OPEN | RESEARCH REPORT

Nicholas D. Cross, DPT, M.Physio[1] ■ Matthew Wirdnam, DPT[1,2] ■ Craig Purdam, B.Physio, PhD h.c[3]
Timothy A. Sayer, DPT, PhD[1,4] ■ Ebonie Rio, B.Physio, M.Physio, PhD[2] ■ Christian Bonello, B.Physio, M.Physio[2]

Provocation With Progressive Loading Is the Most Common Diagnostic Method for Achilles Tendinopathy: An International Cross-Sectional Study of 1048 Physiotherapists

■ **OBJECTIVE:** To explore and define the diagnostic criteria and practices employed by physiotherapists worldwide for Achilles tendinopathy.

■ **DESIGN:** A cross-sectional study using an anonymous online survey distributed to physiotherapists internationally. The survey captured diagnostic criteria, use of objective tests, and imaging techniques in the management of Achilles tendinopathy.

■ **METHODS:** The survey, collaboratively designed by experts in Achilles tendinopathy, comprised 27 questions covering demographic information, diagnostic practices, and the use of imaging. The survey was disseminated through various social media platforms and professional events. All data were collected via REDCap.

■ **RESULTS:** One thousand and forty-eight physiotherapists completed the survey. Physiotherapists reported that symptom response to a series of progressive Achilles loadings tests (92%), pain tolerance palpating the Achilles tendon (79.8%) and visual comparison of the Achilles tendon (63.8%) were helpful objective tests to establish a diagnosis of Achilles tendinopathy. The most commonly referred form of imaging was ultrasound at radiology clinics (n = 460, 63.3%).

■ **CONCLUSION:** This global survey provides clinical perspective of physiotherapists diagnosing Achilles tendinopathy Although using a progressive loading protocol to form a clinical diagnosis, physiotherapists were also using pain elicited on palpation to further establish diagnosis of Achilles tendinopathy, despite recent studies that have demonstrated Achilles palpation pain is present in a variety of posterior ankle conditions and that there is no standardized pressure for palpation.
JOSPT Open 2025;3(1):93-98. Epub 2 October 2024. doi:10.2519/josptopen.2024.0080

■ **KEY WORDS:** *ankle, differential diagnosis/primary care, foot, lower extremity, musculoskeletal health care, tendinopathy/tendinitis*

In physically active populations, the prevalence of Achilles tendinopathy is 6.2% to 9.5% and most common in gymnastics and ball sports (17%).[17,26] In nonactive populations, the prevalence of Achilles tendinopathy has been reported to be 2.35 per 1000 patients per year.[1] There is no gold standard for diagnosing Achilles tendinopathy; clinicians rely on clinical tests to aid their diagnosis. Unfortunately, these tests have variable accuracy and reproducibility.[3] Further complicating diagnosis is the fact that asymptomatic pathology is common, with structural tendon changes being symptomatic in only 25% of cases.[12,15] Research often uses patient self-report of morning stiffness and/or pain in the tendon area, pain on palpation of the tendon, and detection of Achilles tendon thickening as diagnostic and inclusion criteria.[15] Heterogeneity in diagnostic criteria for Achilles tendinopathy may lead to inappropriate diagnosis and management, as well as clinical difficulty when interpreting research.[21]

In 2019, the International Scientific Tendinopathy Symposium Consensus recommended standards for reporting terminology and participant characteristics in tendinopathy research.[22,24] Expert consensus recommends reporting the following characteristics: sex, age, standing height, body mass, history of tendinopathy, whether imaging was used to confirm pathology, loading tests, pain location, symptom duration and severity, level of disability, comorbidities, physical activity level, recruitment source and strategies, and medication use history.[28] Tendon pain on palpation did not reach consensus, that included clinicians, researchers, and patients. Consensus recommendations also discussed interpreting radiology findings. Ultrasound and magnetic resonance imaging (MRI) did not reach consensus due to the limited nature in identifying tendon-specific pathoanatomical diagnosis.[8] In the Achilles tendon, the extent of disorganization quantified by Ultrasound Tissue Characterization (UTC) should not be used as a marker for the presence or severity of current and future symptoms, and previous history of symptoms is a stronger risk factor.[10,11]

[1]Melbourne CBD Physiotherapy and Sports Medicine Clinic, Melbourne, Australia. [2]The Australian Ballet, La Trobe University, Melbourne, Australia. [3]Elite Rehab & Sports Physiotherapy, La Trobe University, Canberra, Australia. [4]Melbourne University, Melbourne, Australia.ORCID: David Cross, 0009-0008-7829-2775. The authors declare there was no funding toward the present manuscript. The present study was approved by the La Trobe University Human Research Ethics Council. The authors certify that they have no affiliations with or financial involvement in any organization or entity with a direct financial interest in the subject matter or materials discussed in the article. Address correspondence to Nicholas Cross, Melbourne CBD Physiotherapy and Sports Medicine Clinic, Ground Floor, 179 Queen St, Melbourne, VIC 3000, Australia. E-mail: nicholas@melbournecbdsportsmed.com.au

In musculoskeletal medicine, accurate diagnosis is paramount to ensure appropriate management and timely return to function. There are multiple differential diagnoses in the posterior heel, including peritendonitis, tibialis posterior tendinopathy, superficial calcaneal bursitis, sural nerve entrapment, plantaris tendon pathology, and ankle joint conditions.[2,16] Copresentations of the above or systemic issues with Achilles tendinopathy are also acknowledged. Surveys of clinicians treating midportion Achilles tendinopathy highlighted that clinical experience and research evidence were common factors that influenced management plans.[6,19] Based on the prevalence of Achilles tendinopathy, the plethora of clinical tests available, and conflicting information regarding the diagnostic criteria, our primary aim was to investigate the diagnostic criteria currently used by clinicians for diagnosing Achilles tendinopathy. Our secondary aim was to explore differences between undergraduate and postgraduate physiotherapist responses.

METHODS

This cross-sectional study used an anonymous online survey to investigate how physiotherapists around the world diagnose Achilles tendinopathy. Ethical approval was provided by the La Trobe University Human Ethics Research Committee (ethics approval number: HEC20320). No identifiable participant information was obtained as part of the survey, and informed consent was implied if participants continued beyond the first question. The survey was collaboratively designed by 5 Australian physiotherapists with master's qualifications in sports and exercise physiotherapy. Two of the 5 physiotherapists also held PhD qualifications, with previous research expertise in Achilles tendinopathy. Diagnostic questions were designed with reference to clinical guidelines and consensus statements for insertional and midportion Achilles tendinopathy.[7,18,27]

Data Collection Methods

The survey was pretested on 2 separate occasions. Each pretest involved 10 Australian physiotherapists with 1 to 15 years of clinical experience, both with and without postgraduate qualifications in sports, musculoskeletal, and clinical research. Following each pretesting period, feedback was obtained from each participant regarding survey flow, ambiguity, and clinical relevance. Those involved in piloting were not included in the study. The changes made following pretesting included changes to terminology, phrasing of questions, and flow of questions. The broad clinical spectrum of participants involved in the pretesting period reflected the intended participants. The survey contained 27 questions pertaining to demographic information (9 questions), diagnostics and use of objective tests (14 questions), and potential use of imaging in establishing an Achilles tendinopathy diagnosis (4 questions). Most questions were multiple choice with the ability to expand on responses (**SUPPLEMENTAL FILE 1**).

Survey Administration

Potential participants were invited to participate via social media platforms (LinkedIn, Twitter [X], Facebook) and at symposium events run by Melbourne CBD Physiotherapy and Sports Medicine Clinic and the La Trobe Sports and Exercise Medicine Research Centre. The survey was distributed, and data were collected via REDCap software (Vanderbilt University, Nashville, TN).

Qualified and registered physiotherapists who assess and manage Achilles tendinopathy were eligible to partake in this study. Physiotherapist responses were excluded if participants exited the questionnaire prior to submitting answers in the imaging section. To minimize the likelihood of multiple survey responses from a singular participant, eligible physiotherapists were only able to complete a single survey response using the same IP address.

Statistical Analysis

Data analysis was performed with REDCap. When conducting additional analyses comparing undergraduate and postgraduate physiotherapists, specific data were extracted from REDCap and further analyzed via Python software (version 3.12.1). Frequency analysis was performed to identify the differences between the level of physiotherapy education. When presenting this original research, the Checklist for Reporting of Survey Studies (CROSS) was followed for reporting of survey data.[25] Data were collected between June 2020 and April 2024.

RESULTS

One thousand and forty-eight physiotherapists completed the survey (Australia [72.1%], international [27.9%]; **TABLE 1**). Most participants (63.6%) had completed or were in the process of completing postgraduate studies, with sports physiotherapy (36.4%) being the most frequent postgraduate degree. Participants who completed the survey reported that they had been practicing for 0 to 3 years (21.6%), 4 to 6 years (17.4%), 7 to 10 years (18.3%), and 10+ years (42.6%). Most participants reported working in private practice (78.3%) and in sports teams (11.6%). Forty-five percent of participants reported seeing between 2 and 5 patients (44.7%) with Achilles tendinopathy per month.

Presentation, Population, and Activities

Six-hundred and twenty-nine participants (60.4%) reported that midportion Achilles tendinopathy was the most common presentation observed, followed by mixed

TABLE 1
Respondent Characteristics Based on Location (Country), Level of Education, and Experience as a Physiotherapist

Characteristic	Details	Total n (%)
Country		1048
	Australia	756 (72)
	Europe	190 (18)
	North America	35 (3)
	Oceania	29 (3.5)
	Asia	26 (2.5)
	Africa	6 (0.5)
	South America	6 (0.5)
Highest level of study		652
	Graduate certificates	125 (19)
	Masters by coursework	427 (66)
	Masters by research	62 (10)
	Doctorate	38 (6)
Years practicing		1044
	0-3	226 (22)
	4-6	182 (17)
	7-10	191 (18)
	10+	445 (42)
Majority of time working		1036
	Private practice	818 (78.3)
	Hospital	39 (3.7)
	Sporting team	121 (11.6)
	Community health	12 (2.0)
	Other	46 (4)
How many patients with Achilles tendinopathy per month		1033
	< 1 month	213 (20)
	1 per month	281 (27)
	2-5 per month	467 (45)
	11-15 per month	66 (5)
	16-20 per month	3 (0.5)
	20+ per month	3 (0.5)

presentations (20.3%), insertional Achilles tendinopathy (17.4%), and peritendon presentations (1.6%). The most reported age group (s) with Achilles tendinopathy was people aged 41 to 50 years (50.5%), 31 to 40 years (49%), and 21 to 30 years (32.7%). The most reported category seen clinically was recreational athletes (80.1%), followed by sedentary individuals (31.5%), semielite athletes (21.6%), and elite athletes (15.5%). Running, specifically jogging, was the most reported activity associated with Achilles tendinopathy (76%).

Objective Assessment for Achilles Tendon Diagnosis

The most used objective tests to help establish a diagnosis among both postgraduate and undergraduate physiotherapists were symptom response to a series of progressive Achilles loadings tests (postgraduate, n = 613, 92%; undergraduate, n = 319, 84%), pain tolerance when palpating the Achilles tendon (postgraduate, n = 512, 77%; undergraduate, n = 319, 84%), visual comparison of the Achilles tendon (postgraduate, n = 418, 63%; undergraduate, n = 246, 65%), and symptom modification in response to isometric exercise (postgraduate, n = 405, 60%; undergraduate, n = 245, 64%) (**TABLE 2**). During the implementation of a progressive Achilles loading test, physiotherapists most reported they discontinued the evaluation when patient symptoms reached a moderate intensity, specifically between 4 and 6 out of 10 on a numerical rating scale (76% of respondents).

Differential diagnosis of Achilles tendinopathy was also recorded (**TABLE 3**). The most common tests were posterior impingement test (postgraduate, n = 478, 72%; undergraduate, n = 223, 58%), palpation of calcaneal fat pad (postgraduate, n = 422, 64%; undergraduate, n = 245, 63%), Thompsons/Simmonds squeeze test (postgraduate, n = 350, 53%; undergraduate, n = 205, 54%), compression/squeeze of the calcaneum (postgraduate, n = 334, 50%; undergraduate, n = 199, 52%) and symptoms (pain response) in maximal ankle plantar flexion (postgraduate, n = 293, 38%; undergraduate, n = 147, 44%).

Imaging Investigations

A moderate proportion of respondents never used imaging to aid with managing Achilles tendinopathy (n = 292, 28.2%), whereas a large proportion used imaging between 10% and 90% of cases (n = 724, 70%) and a very small proportion always referred for imaging (n = 19, 1.8%). Of those who referred for imaging (**TABLE 4**), the most commonly referred form of imaging was ultrasound at radiology clinical (postgraduate, n = 294, 60%; undergraduate, n = 166, 69%) and MRI (postgraduate, n = 121, 25%; undergraduate, n = 55, 23%). The 3 key pieces of clinical information participants obtained from imaging were partial tear of the Achilles tendon (postgraduate, n = 334, 65%; undergraduate, n = 175, 34%), effusion of the peritendon (postgraduate, n = 300, 67%; undergraduate, n = 145, 32%), and bursal hypertrophy (postgraduate, n = 191, 67%; undergraduate, n = 91, 32%).

TABLE 2
Most Common Objective Tests Reported by Respondents to Diagnose Achilles Tendinopathy for Postgraduate and Undergraduate Physiotherapists

Objective Tests	Postgraduate n (%) 2355	Undergraduate n (%) 1385
London Hospital Test	94 (14)	45 (12)
Stethoscope auscultation for crepitus	15 (4)	39 (6)
Pain tolerance when palpating the Achilles tendinopathy	512 (77)	319 (84)
Plantar flexor muscle bulk (shank girth [cm])	140 (21)	56 (15)
Symptom response to a series of progressive Achilles loading tests	613 (92)	349 (92)
Visual comparison of the Achilles tendon	418 (63)	246 (65)
Symptom modification in response to isometric exercises	405 (60)	245 (64)
Radiology confirmation	91 (14)	49 (13)
Other	67 (10)	37 (9)

TABLE 3
Most Commonly Used Objective Tests to Differentially Diagnose Achilles Tendinopathy Between Postgraduate and Undergraduate Physiotherapists

Differential Diagnostic Test	Postgraduate n (%) 2234	Undergraduate n (%) 1156
Posterior impingement	478 (72)	223 (58)
Palpation of calcaneal fat pad	422 (64)	245(63)
Thompsons/Simmonds squeeze test	350 (53)	205 (54)
Compression/squeeze of the calcaneum	334 (50)	199 (52)
Symptoms (pain) in maximal ankle plantar flexion	293 (38)	147 (44)
Sural nerve test	302 (45)	117 (31)
Stethoscope auscultation	55 (8)	20(5)

TABLE 4
Most Common Imaging Referral Type and Clinical Reasoning Behind Referral for Postgraduate and Undergraduate Physiotherapists

Most Common Imaging Referral	Postgraduate n (%) 476	Undergraduate n (%) 236
Ultrasound at radiology clinics	294 (60)	166 (69)
Magnetic resonance imaging (MRI)	121(25)	55 (23)
Ultrasound performed independently	47 (10)	11 (5)
Ultrasound tissue characterization (UTC)	14 (3)	4 (2)
Clinical Reason for Referral	**825**	**411**
Partial tear of the Achilles tendon (AT)	334 (65)	175 (34)
Peritendon effusion	300 (67)	145(32)
Bursal hypertrophy	191 (67)	91(32)

DISCUSSION

This was the largest global survey of physiotherapists about the diagnostic criteria they used for Achilles tendinopathy in clinical practice. Our main aim was to characterize the key clinical criteria for diagnosis of Achilles Tendinopathy, and our secondary aim was to explore differences between postgraduate and undergraduate physiotherapists.

Symptom response to a series of progressive Achilles loadings tests (92%), pain tolerance when palpating the Achilles tendon (79.8%), and visual comparison of the Achilles tendon (63.8%) were the most common answers by physiotherapists. These findings were similar irrespective of whether a physiotherapist had completed postgraduate or undergraduate study.

While progressive load tests of the Achilles tendon appear to be used in clinical practice and are supported by previous research,[5,22] the association between Achilles tendon loading and a painful/symptomatic response from patients with Achilles tendinopathy is more complex. There is a limited relationship between Achilles tendon loading across various low- to high-force Achilles tendon exercises and Achilles pain response among male recreational runners.[23] In contrast, there is a positive relationship between higher Achilles tendon loading exercises and pain response among patients with chronic Achilles tendinopathy.[14] These findings highlight the complexity of eliciting pain from progressive load tests, which may be due to the variation in sex, recreational fitness levels, type of sport, and diagnostic criteria for inclusion in these studies, which could be considered in future research. Physiotherapists also commonly used the posterior impingement test, palpated the calcaneal fat pad, and completed a Thompsons/Simmonds squeeze test (a test for suspected tendon rupture), for evaluating nociceptive causes of Achilles tendinopathy to a similar degree in both postgraduate and undergraduate physiotherapists. Despite the use of these tests for differential diagnosis, there is no clear association between either positive or negative ankle impingement test and imaging findings.[4] The Thompson/Simmonds squeeze test is a valid and reliable test for Achilles tendon rupture,[26] and therefore, it is surprising that respondents chose this for Achilles tendinopathy given

that tendinopathy and tendon rupture are typically very different mechanisms of injury and clinical presentation. Interestingly, results from this survey highlighted that imaging, particularly ultrasound and MRI, was used by physiotherapists to establish both the diagnosis and alternative causes of Achilles tendinopathy. Physiotherapists looked for altered structural states, with a large proportion of clinicians interested in partial tears in tendon structure to help form their formal diagnosis. These findings are in contrast between clinical practice and consensus guidelines.[9,20,22] Tendon structure has previously been assessed by UTC and is the preferred form of imaging for structural integrity of the tendon,[13] whereby pathological tendons appear to increase cross-sectional area compared to healthy/nonpathological tendons.[9] Despite these findings, the feasibility of using UTC in clinical practice is low as these devices are very expensive and require significant training. There is limited evidence that assessment of tendon structure in clinical practice is associated with clinical symptoms experienced by patients with Achilles tendinopathy, thereby limiting their use in a physiotherapist's examination.

Limitations

The survey responses were not equally distributed across countries, which may have influenced the results given education and beliefs on diagnosis of Achilles Tendinopathy may vary. Further, the survey was restricted to English-speaking participants and the potential selection and recall bias of clinicians with a particular interest in Achilles tendinopathy. Despite these challenges, our study's strength lies in its international reach and the substantial overall number of responses, making it one of the largest cohorts to date and significantly surpassing previous literature,[6] which focused on a much smaller, region-specific group. The survey itself covered all components of formalizing a diagnosis. However, a limitation of the survey design was that physiotherapists were unable to elaborate on how they modify objective tests, specifically a progressive loading protocol to form an alternative diagnosis.

Summary

This global survey provides clinical perspective of physiotherapists diagnosing Achilles tendinopathy. We identified critical gaps between clinic practice and research evidence, and urge a more cohesive approach to bridge these domains. There are clinical practice challenges in using advanced imaging techniques, despite their acknowledged value in diagnosing Achilles tendinopathy. This research not only contributes to the broader understanding of Achilles tendinopathy management but also prompts reflection on the integration of research evidence into clinical practice, advocating for ongoing dialogue and collaboration between researchers and clinicians to enhance patient care outcomes. ■

KEY POINTS

FINDINGS: A progressive loading protocol in the assessment of Achilles tendinopathy was the most used clinical assessment to help establish a diagnosis of Achilles tendinopathy. Ultrasound and magnetic resonance imaging were the most used imaging methods by physiotherapists to establish both diagnosis and alternative causes or comorbidities of Achilles tendinopathy.

IMPLICATIONS: The survey results strengthen understanding of physiotherapists' adherence to evidence-based practices in diagnosing Achilles tendinopathy, highlighting the integration of symptom response evaluations and progressive loading protocols. This alignment with research not only enhances clinical accuracy but also guides physiotherapists in refining treatment strategies to improve patient outcomes.

CAUTION: Responses were predominantly from Australian-based participants, potentially limiting generalizability to other global contexts. The survey was restricted to English-speaking participants, introducing a selection bias toward clinicians with a specific interest in Achilles tendinopathy. These factors may affect the broader applicability of the findings to diverse clinical settings and populations.

STUDY DETAILS

AUTHOR CONTRIBUTIONS: N.C., C.B., E.R., and C.P. were responsible for the design of the study. N.C., E.R., C.B., C.P., and T.S. were responsible for data collection. N.C., E.R., C.B., and M.W. were responsible involved in processing and completing the statistical analysis of the data sets. All authors were involved in the interpretation of the data and critically revised the data sets. All authors contributed to preparing the manuscript, with all authors approving the final manuscript. N.C. takes full responsibility for the integrity of the work as a whole. All authors have read and agreed to the final and published version of the manuscript.

DATA SHARING: All data relevant to the study are included in the article or are available as supplemental files. None of the data sets included in the manuscript is identifiable.

PATIENT AND PUBLIC INVOLVEMENT: Not applicable.

REFERENCES

1. Albers IS, Dekker JH, Diercks RL, Van den Akker-Scheek I, Zwerver J. Incidence and prevalence of lower extremity tendinopathy in a Dutch general practice population: a cross sectional study. *BMC Musculoskelet Disord*. 2016;17:16. https://doi.org/10.1186/s12891-016-0885-2
2. Alshami AM, Coppieters MW, Souvlis T. A review of plantar heel pain of neural origin: differential diagnosis and management. *Man Ther*. 2008;13:103-111. https://doi.org/10.1016/j.math.2007.01.014

3. Auliffe SM, Korakakis V, Hilfiker R, Whiteley R, O'Sullivan K. Participant characteristics are poorly reported in exercise trials in tendinopathy: a systematic review. *Phys Ther Sport*. 2021;48:43-53. https://doi.org/10.1016/j.ptsp.2020.12.012
4. Baillie P, Ferrar K, Cook J, Smith P, Lam J, Mayes S. Posterior ankle impingement syndrome clinical features are not associated with imaging findings in elite ballet dancers and athletes. *Clin J Sport Med*. 2022;32:600-607. https://doi.org/10.1097/JSM.0000000000001021
5. Baxter JR, Corrigan P, Hullfish TJ, O'Rourke P, Silbernagel KG. Exercise progression to incrementally load the achilles tendon. *Med Sci Sports Exerc*. 2021;53:124-130. https://doi.org/10.1249/MSS.0000000000002459
6. Bonello C, Menz HB, Munteanu SE, Rio E, Docking SI. Treatment preferences and use of diagnostic imaging in midportion Achilles tendinopathy by Australian allied health professionals. *Phys Ther Sport*. 2022;53:21-27. https://doi.org/10.1016/j.ptsp.2021.11.001
7. Carcia CR, Martin RL, Houck J, et al. Achilles pain, stiffness, and muscle power deficits: achilles tendinitis. *J Orthop Sports Phys Ther*. 2010;40:A1-A26. https://doi.org/10.2519/jospt.2010.0305
8. Docking SI, Cook J. How do tendons adapt? Going beyond tissue responses to understand positive adaptation and pathology development: a narrative review. *J Musculoskelet Neuronal Interact*. 2019;19:300-310 https://www.ncbi.nlm.nih.gov/pubmed/31475937
9. Docking SI, Cook J. Pathological tendons maintain sufficient aligned fibrillar structure on ultrasound tissue characterization (UTC). *Scand J Med Sci Sports*. 2016;26:675-683. https://doi.org/10.1111/sms.12491
10. Docking SI, Hart HF, Rio E, Hannington MC, Cook JL, Culvenor AG. Explaining variability in the prevalence of achilles tendon abnormalities: a systematic review with meta-analysis of imaging studies in asymptomatic individuals. *J Orthop Sports Phys Ther*. 2021;51:232-252. https://doi.org/10.2519/jospt.2021.9970
11. Docking SI, Rio E, Cook J, Carey D, Fortington L. Quantification of Achilles and patellar tendon structure on imaging does not enhance ability to predict self-reported symptoms beyond grey-scale ultrasound and previous history. *J Sci Med Sport*. 2019;22:145-150. https://doi.org/10.1016/j.jsams.2018.07.016
12. Docking SI, Rio E, Cook J, Orchard JW, Fortington LV. The prevalence of Achilles and patellar tendon injuries in Australian football players beyond a time-loss definition. *Scand J Med Sci Sports*. 2018;28:2016-2022. https://doi.org/10.1111/sms.13086
13. Docking SI, Rosengarten SD, Daffy J, Cook J. Structural integrity is decreased in both Achilles tendons in people with unilateral Achilles tendinopathy. *J Sci Med Sport*. 2015;18:383-387. https://doi.org/10.1016/j.jsams.2014.06.004
14. Janowski AJ, Post AA, Heredia-Rizo AM, et al. Patterns of movement-evoked pain during tendon loading and stretching tasks in Achilles tendinopathy: a secondary analysis of a randomized controlled trial. *Clin Biomech (Bristol, Avon)*. 2023;109:106073. https://doi.org/10.1016/j.clinbiomech.2023.106073
15. Knapik JJ, Pope R. Achilles tendinopathy: pathophysiology, epidemiology, diagnosis, treatment, prevention, and screening. *J Spec Oper Med*. 2020;20:125-140. https://doi.org/10.55460/QXTX-A72P
16. Lareau CR, Sawyer GA, Wang JH, DiGiovanni CW. Plantar and medial heel pain: diagnosis and management. *J Am Acad Orthop Surg*. 2014;22:372-380. https://doi.org/10.5435/JAAOS-22-06-372
17. Lopes AD, Hespanhol Junior LC, Yeung SS, Costa LO. What are the main running-related musculoskeletal injuries? A systematic review. *Sports Med*. 2012;42:891-905. https://doi.org/10.1007/BF03262301
18. Martin RL, Chimenti R, Cuddeford T, Houck J, et al. Achilles Pain, Stiffness, and Muscle Power Deficits: Midportion Achilles Tendinopathy Revision 2018. *J Orthop Sports Phys Ther*. 2018;48:A1-A38. https://doi.org/10.2519/jospt.2018.0302
19. Murphy MC, Debenham J, Bulsara C, et al. Assessment and monitoring of Achilles tendinopathy in clinical practice: a qualitative descriptive exploration of the barriers clinicians face. *BMJ Open Sport Exerc Med*. 2022;8:e001355. https://doi.org/10.1136/bmjsem-2022-001355
20. Rio E, Docking SI. Adaptation of the pathological tendon: you cannot trade in for a new one, but perhaps you don't need to? *Br J Sports Med*. 2018;52:622-623. https://doi.org/10.1136/bjsports-2016-097325
21. Rio EK, Rabusin CL, Munteanu SE, et al. Where is your pain? Achilles tendinopathy pain location on loading is different to palpation, imaging and recall location. *J Orthop Sports Phys Ther*. 2024;54:1-9. https://doi.org/10.2519/jospt.2023.12131
22. Rio EK, Scott A, Speed C, et al. ICON 2019-International Scientific Tendinopathy Symposium Consensus: There are nine core health-related domains for tendinopathy (CORE DOMAINS): Delphi study of healthcare professionals and patients. *Br J Sports Med*. 2020;54:444-451. https://doi.org/10.1136/bjsports-2019-100894
23. Sancho I, Willy RW, Morrissey D, Malliaras P, Lascurain-Aguirrebeña I. Achilles tendon forces and pain during common rehabilitation exercises in male runners with Achilles tendinopathy. A laboratory study. *Phys Ther Sport*. 2023;60:26-33. https://doi.org/10.1016/j.ptsp.2023.01.002
24. Scott A, Squier K, Alfredson H, et al. ICON 2019: international scientific tendinopathy symposium consensus: clinical terminology. *Br J Sports Med*. 2020;54:260-262. https://doi.org/10.1136/bjsports-2019-100885
25. Sharma A, Minh Duc NT, Luu Lam T. A consensus-based checklist for reporting of survey studies (CROSS). *J Gen Intern Med*. 2021;36:3179-3187. https://doi.org/10.1007/s11606-021-06737-1
26. Wang Y, Zhou H, Nie Z, Cui S. Prevalence of Achilles tendinopathy in physical exercise: a systematic review and meta-analysis. *Sports Med Health Sci*. 2022;4:152-159. https://doi.org/10.1016/j.smhs.2022.03.003
27. Xu H, Li H, Hua Y, et al. Chinese consensus on insertional Achilles tendinopathy. *Orthop J Sports Med*. 2019;7. https://doi.org/10.1177/2325967119879052
28. Zwerver J, Mc Auliffe S, Rio EK, Scott A, Vicenzino BT, Weir A. ICON 2019-international scientific tendinopathy symposium: building an ICONic tendon tower-launching a new era in clinical tendinopathy research. *Br J Sports Med*. 2020;54:442-443. https://doi.org/10.1136/bjsports-2019-101214