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Exploring the digital landscape: A scoping review of Achilles tendinopathy education on public websites and in randomised controlled trials

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Abstract

Objectives: The aims of this scoping review were to (i) map education from randomised controlled trials and public websites for Achilles tendinopathy to pre-defined categories and (ii) appraise the quality of education available.

Data sources: Sources were extracted via a search of multiple databases and from the first three pages of targeted Google searches in English, Chinese, and Spanish (websites).

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Review methods: The frequency of sources that reported on each pre-defined category (n = 15) was reported, and the content within each category was summarised descriptively. Quality and reliability were assessed with the DISCERN tool (1–5 points, higher score means higher quality and trustworthiness). Understandability and actionability of education was assessed using Patient Education Materials Assessment tool (0–100%, higher scores indicate more comprehensible information with clearer messages and more identifiable actions). Alignment with current international guidelines was reported.
Results: 119 randomised controlled trials and 385 websites were included. Education coverage was better in websites compared to trials, particularly related to pathology and management. Conflicting advice was found on websites (e.g. when treatment should be sought). Quality (1.6 ± 0.5) and reliability (2.1 ± 0.7) of education were poor, with low scores for treatment risks and shared decision-making. Understandability was moderate (59%) and actionability was poor (28%). Alignment with clinical guidelines was low, with key information commonly omitted.
Conclusion: Educational sources found in randomised controlled trials and public websites on Achilles tendinopathy are poorly aligned with clinical guidelines. The information gaps in these sources mean that they are unhelpful to patients and may steer them towards inappropriate decisions. The review highlights the need for the development of accurate, meaningful, and evidence-based educational resources for individuals with Achilles tendinopathy.

Keywords
Achilles tendinopathy, scoping review, education

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Clinical messages

- Current publicly available websites commonly omit important information for patients with Achilles tendinopathy, such as education about treatment expectations and prognosis.
- There is a need for quality educational material for individuals with Achilles tendinopathy to help them understand their condition and manage their symptoms.

Introduction

Achilles tendinopathy is a highly prevalent and disabling musculoskeletal condition, affecting millions of people (cumulative prevalence of 6%).[1] It is associated with reduced work capacity in 38% of those affected[2] and up to 60% of people with Achilles tendinopathy have continued pain and disability after 5 years despite exercise interventions.[3] Clinical guidelines[4,5] and expert narratives[6–8] recommend education and exercise for Achilles tendinopathy. It is recommended to provide education about various topics including the condition, prognosis, and pain education.[4,5] However, education is an umbrella term and may also include other topics such as incidence and prevalence, natural history and expected recovery, which can have other indirect benefits such as reducing anxiety and catastrophising.[9]

Most people use internet search engines as a primary source of health information or even instead of consulting a health professional[10,11] (for example, about 2500 in the UK searched 'Achilles tendonitis' in the last 12 months 'Google Trends, accessed August 2024). Accurate sources of information on the internet are essential and may help to minimise costs (mostly from healthcare appointments[2]) and promote patient autonomy and self-management. However, not all information found on the internet is correct or helpful. Inappropriate education may lead to unsuitable treatment and perpetuate erroneous health consumer beliefs about their condition which can be harmful.

Appropriate education resources have not yet been developed with input from clinicians, researchers and patient stakeholders. The first step in this process is to identify education resources that are

currently available from websites and randomised controlled trials and, where appropriate, appraise their quality. By identifying high-quality resources that can be confidently recommended for clinical use, it will support more effective patient education and management. However, both the scope and quality of current educational materials for Achilles tendinopathy are unknown.

The primary aim of this scoping review is to map education from randomised controlled trials and public websites for Achilles tendinopathy to predefined categories based on best practice evidence-based clinical guidelines. The secondary aim is to appraise the quality, reliability, understandability, actionability and alignment with the clinical guidelines of public websites and participant-facing randomised controlled trial education content for Achilles tendinopathy.

Methods

Our review followed guidance from the Joanna Briggs Institute[12] and reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews guidelines.[13] The protocol for this review was prospectively published via the Open Science Framework (https://doi.org/10.17605/OSF.IO/HDZMJ).

Equity, diversity, and inclusion statement

In conducting this scoping review, we assembled a diverse group of researchers to ensure a broad range of perspectives and expertise. Our team included contributors from various countries (United States of America, Argentina, Spain, Australia, the United Kingdom, China, Ireland, and the Netherlands), which enabled data collection in three languages and diverse cultural and contextual perspectives in our analysis. The authors were mainly physiotherapists (80%) but also included medical doctors (20%). Over one-third of the authors are women. Additionally, our team included both early career (PN, ST, IS, DR) and undergraduate (JJ) and doctoral student researchers (MP, HS, JB, WBC, JD, TF) alongside experienced researchers.

Eligibility criteria

Education was defined as '*knowledge or actionable advice related to any aspect of Achilles tendinopathy*'. All sources of websites (including social media) or randomised controlled trials were included if they provided education related to any of our pre-determined categories listed in Supplementary File 1 (based on clinical practice guidelines[4,5]).

We excluded websites that were not freely accessible, links to videos (e.g. YouTube), audio files, duplicate or inactive websites, websites that had a primary purpose of advertising commercial products or websites that were not in English, Chinese or Spanish. If a website or randomised controlled trial only included a description of the exercise prescribed and exercise variables i.e. only covering components of frequency, intensity, time, type and no other education, they were excluded. In contrast, education provided alongside exercise, such as education about how to regress and progress exercise and acceptable pain during exercise was included. This is because we were interested in education rather than specifics of the exercise prescribed, which has been reviewed elsewhere.[14]

Patient and public involvement

To inform the search strategy website search terms were informed by a patient and public involvement process. Authors [PM, AM, SMA, KGS, RJdV] consulted 10 patients with Achilles tendinopathy (Australia [n = 3], Netherlands [n = 3], USA [n = 2], England [n = 1], Ireland [n = 1], mean age 42 and duration of symptoms 36 months, 30% female) who had previously sought information about this condition from the internet. They were asked about search engines and search strategies they used. The patients were acknowledged as participants in this research.

Search strategy and information sources

Websites: In addition to consulting patients, search terms were also developed by accessing the Google search terms used by health consumers, as accessed via a Google paid advertising campaign

to recruit people with Achilles tendinopathy for a separate study run by one of the authors (KGS) in the United States of America (in 2022). We selected the 10 most popular search terms based on patient consultation and the 10 most popular health consumer searches on Google (20 search terms in total, see Supplementary file 2). After clearing the cache and search history (eliminating bias from prior search history), a lead author, based in Australia (PM), searched each term in Google in April 2023. The same author repeated this process with a virtual private network from the United Kingdom and United States of America (to identify different English language websites from these geographical regions). The search terms were translated into Chinese and Spanish and searched using these languages by authors who are native Chinese (JD) and Spanish (IS) speakers. In August 2024, each website link was checked, and inactive URLs were removed (reported in the PRISMA flow diagram). For each search term, we extracted websites that met eligibility in the first three pages of Google results.

Trials: Randomised controlled trials were identified via an updated search for a living systematic review on Achilles tendinopathy which aimed to identify all randomised controlled trials for this condition.[15]

Selection process

Fourteen reviewers (PM, RLC, WBC, JD, TF, DR, SS, ST, MP, HPS, IS, JJ, SMA, AM) working independently in pairs to review the yield of websites and trials to remove duplicates and assess eligibility. The reviewers were grouped into three separate teams focusing on English (PM, SS, ST, MP, HS, JJ, SMA, AM), Spanish (RLC, TF, DR, IS) and Chinese websites (WBC, JD) respectively. Any disagreements were resolved by discussion within the author team. The website eligibility was assessed based on material that was contained within the pages arising from the parent URL, whereas links to external URLs (other websites) were not considered. Where available, patient-facing materials were sourced from trials (usually supplementary files) but only if the materials were created by the trial authors and not linked to external resources. We planned to contact trial authors to provide patient-facing materials if they were mentioned but not included in the trial report (there were no instances where this occurred).

Extraction of characteristics of websites and trial data

The same pairs of reviewers extracted data from the websites and trial data using a standard extraction template (Supplementary File 3).

Education data extraction and deductive categorisation

The same pairs of reviewers extracted data (same language-aligned teams as above but PM did not participate) from each of the websites and trials and entered it into the pre-defined spreadsheet described above. Website data could be extracted from any page of the website and trial data were extracted from the methods section. Reviewers met on three occasions to discuss the process for data extraction and categorisation.

An independent reviewer [PM] checked all extracted data to ensure that data were categorised appropriately. Discrepancies were discussed with the reviewers who originally categorised the data, with re-categorisation occurring as needed. All instances of re-categorisation were checked with a second reviewer [JJ]. The remaining discrepancies were resolved via discussion with the author team. During this process of checking the deductive categorisation, some of the original categories were removed or collapsed into new categories due to overlap (Supplementary File 1). This was decided via discussion and consensus within the author group.

Content analysis of education data in each category

The deductive categorisation was used to distil the education content into 31 distinct subcategories.[16,17] Extracted text from each source for each individual subcategory was then entered into an Excel file. One coder [PN] read and re-read text in a category and then developed codes (units of meaning) until no

new codes were identified. These codes were checked by a second reviewer [PM] and discrepancies were resolved via discussion. In the reporting phase, we described the codes and subcategories, highlighting potential gaps similarities and differences between sources. Strategies to maintain the trustworthiness of the analysis included immersion in data and reflexivity within the analysis team (acknowledging background and standpoints and active reflection within the pair who developed the codebook for each category when they met).

Critical appraisal of individual sources of evidence

Consistent with scoping review guidelines[13] and the aims of this scoping review, we did not appraise the quality or risk of bias of the included trials. This is because the quality or risk of bias of the studies may not be related to the quality of the education provided. Instead, we appraised the quality, reliability, understandability and actionability of the education content, as well as alignment with current clinical guidelines. Website education content (both text on the site as well as URLs that linked to PDFs) were appraised but only patient-facing education materials from trials were appraised (e.g. PDF leaflet). Text extracted from within the methods section of trials was not appraised because it is not intended to be patient-facing.

Quality and reliability of the content were appraised using the DISCERN instrument,[18] and understandability and actionability were assessed using the Patient Education Materials Assessment Tool (PEMAT).[19] The DISCERN tool is a standardised instrument designed to evaluate the quality and reliability of written health information. The instrument rates the trustworthiness of health information on treatment options using a 5-point scale (no [1], partially [,23,4], yes [5]). The PEMAT focuses on the understandability and actionability of education content with each item rated as 'yes', 'no' or 'not applicable'. The PEMAT has a range from 0–100%, with higher scores indicating information with clearer messages and more identifiable actions. These standardised and well-validated tools are intended to assess patient-facing education materials and can be used in combination to achieve a complete understanding of the usefulness of written information in providing health information.[20]

We also assessed whether recommendations about terminology, diagnosis, imaging and treatment from all identified sources were consistent with recent evidence-based clinical guidelines for Achilles tendinopathy.[4–6,21] Recommendations from these clinical guidelines were extracted verbatim (Supplementary file 4–6). Each component from websites and trial materials was scored on a 4-point scale (terminal descriptors of 1 = accurate/clearly described and 4 = not mentioned)[22]:

Thirteen reviewers (RLC, WBC, JD, TF, DR, SS, ST, MP, HPS, IS, JJ, SMA, AM) appraised education content from the websites and randomised controlled trials. The reviewers met twice to develop decision rules related to rating each item on the DISCERN and PEMAT. For alignment with clinical guidelines, decision rules were also established for the 'additional treatments' item described above. Uncertainties for alignment with clinical guidelines were resolved by referring to the clinical guidelines[4–6,21] or reviewer discussion. To improve reviewer skills in appraisal, each reviewer pilot appraised two to three websites. Uncertainties were discussed and changes were applied to clarify the decision rules. The reviewers were then allocated a proportion of websites to appraise and could continue to suggest refinements to the decision rules (the final version is shown in Supplementary File 7).

After all the education content was appraised, five completed appraisals from each reviewer were independently reassessed by another reviewer. If agreement on any tool (DISCERN or PEMAT) or guideline component (terminology, diagnosis, treatment) was less than 80%, the reviewers met to discuss discrepancies. In such cases, the reviewers reassessed five more completed appraisals, focusing only on the tool or guideline component that did not reach 80% agreement, and the agreement was reassessed. If a systematic misunderstanding of decision rules was identified in a particular reviewer's appraisals, that reviewer corrected the error across all websites they had previously appraised.

Data analysis

To address the primary aim, the frequency and types of the categories and subcategories of education

deduced from the content analysis were presented in a sunburst chart with the shade indicating frequency.[23] A summary of subcategories (units of meaning) within each category was also provided.

To address the secondary aim, the results from the DISCERN, PEMAT and alignment clinical guidelines were presented descriptively. Appraisal ratings were reported from a tool/guideline component and individual website perspective. We reported means, SD and 95% confidence intervals (DISCERN) or proportions (PEMAT, guideline components) per item for each language in tables (tool/guideline component perspective). As the data were non-normally distributed, we also plotted box and whisker plots showing median, interquartile range, and outliers for the DISCERN tool scores and the percentage of items achieved for the PEMAT and guideline components (individual website perspective). The top 10 performing websites for each tool and guideline component and each language were identified.

A random selection of five websites was used to assess inter-rater agreement and reliability. Agreement was defined as the proportion of items across the five appraised websites for a given tool/guideline component that were scored the same. 80% was set as the minimum acceptable level of agreement.[24] For reliability, we calculated the weighted Kappa for all appraisal tools. For this assessment, data from the DISCERN were considered categorical so we could include when N/A was selected by reviewers (this was recoded numerically). Kappa coefficients were interpreted using McHugh's interpretation; 0 to 0.20 no agreement, 0.21 to 0.39 minimal, 0.40 to 0.59 weak, 0.60 to 0.79 moderate, 0.80 to 90 strong, > 90 almost perfect.[24]

Analyses were performed using Microsoft Excel, Version 16.0 (Microsoft Corp., Redmond, WA, USA) and IBM SPSS Statistics for Windows, Version 29 (IBM Corp., Armonk, NY, USA).

Deviations from the protocol

First, while pre-defined categories guided data extraction, the reviewers allowed for the creation of new categories as they work through the data. Second, exercise variables (FITT: frequency, intensity, time, type) were not extracted as these are not directly about education. Third, due to the large number of sources, one reviewer conducted extraction, with a random 10% sample checked by a second reviewer.

Results

Selection of sources of evidence

We screened 9093 randomised controlled trials from searching the literature and 4052 potential public websites from extensive online searches. After the initial screening (duplicate removal and title and abstract screening for the randomised controlled trials), we excluded 980 randomised controlled trials and 1350 websites. The final yield was 119 trials and 385 websites (Figure 1).

Characteristics of sources of evidence

The 119 trials were published between 1984 and 2025 (median 2017). Half (n = 70, 58%) were on mid-portion, 12% (n = 14) were on insertional Achilles tendinopathy and 9% (n = 11) were on both. The remaining trials did not specify the location. Only five trials (5%) included a PDF including education content that was appraised.

Of the 385 websites, 57% (n = 218) were in English, 49% (n = 189) reported when they were published (between 2009 and 2024; median 2020). Only 18% (n = 69) referenced a source for their information. Over half (n = 225, 58%) did not report which location of tendinopathy (mid-portion or insertional) they focused on. More than half of the websites (n = 219, 57%) were for-profit (e.g. created by health professional clinics) and 22% (n = 85) were non-for-profit (e.g. from public hospitals). Trial and website characteristics are shown in Supplementary File 3.

Synthesis of Achilles tendinopathy education content

The extracted data relating to the primary aim is shown in Supplementary File 3 and summarised in Figure 2 and Table 1.

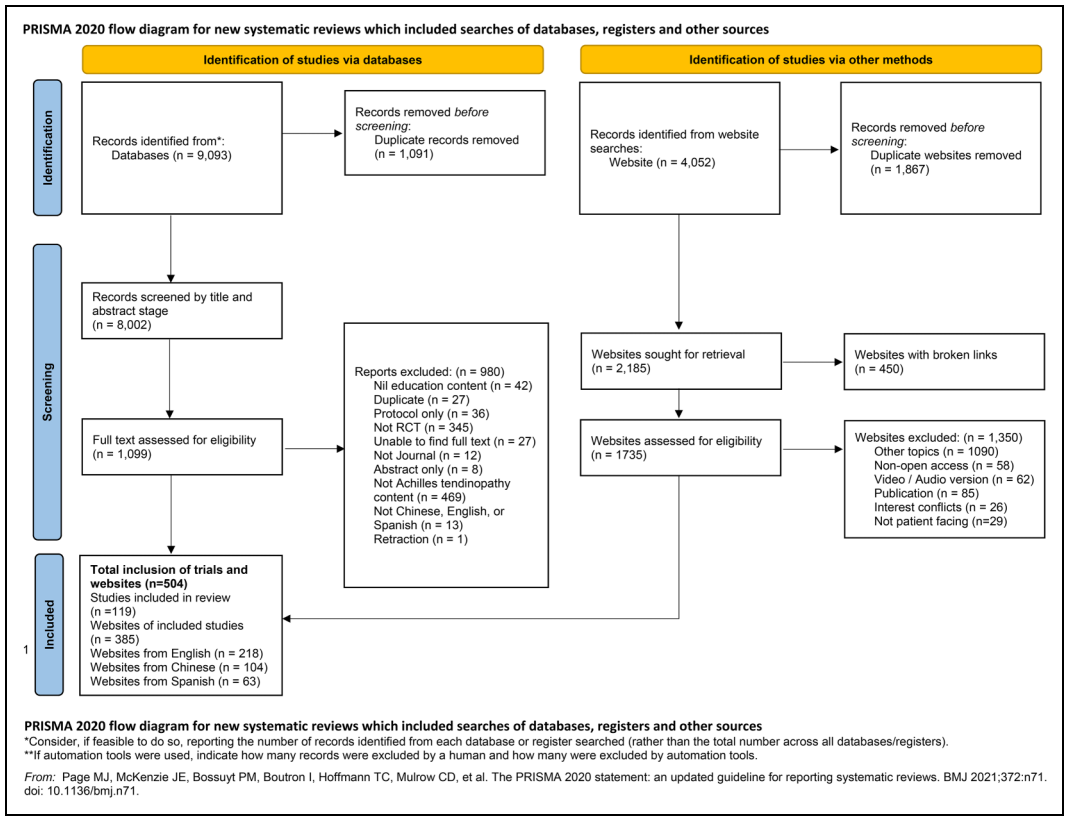

Figure 1. Flow of the source selection.

The frequency and types of education across countries are shown in Figure 2. There were four categories containing no education from any trial (tissue pathology, outcome measures, severity and prevention) whereas every category was covered to some degree by the websites. Education on pathology and management was more common than diagnosis and disease progression across countries. Pathology education was mostly a description of the anatomy/function (average 46% of websites, n = 177), description/symptoms (average 65% of websites, n = 250) and aetiology or risk factors (average 61% of websites, n = 235). Management education was mostly on exercise (average 60% of websites, n = 231 and 59% of trials, n = 70), load management (average 45% of websites, n = 173 and 49% of trials, n = 58), medications (average 40% of websites, n = 154 and 24% of trials, n = 28) and surgery (average 32% of websites, n = 123 and 3% of trials, n = 3). Severity (average 3% of websites, n = 12), outcome measures (average 1% of websites, n = 4) and strategies for adherence (average 2% of websites, n = 8 and 22% of trials, n = 26) were rarely included in the education.

A content analysis describing what was found for each education category is shown in Table 1. Websites used potentially concerning language such as 'micro-tearing' and 'weakening of the tendon'. When described, severity was defined variably in terms of imaging changes and symptoms, and only some English sites mentioned that the severity of imaging may not be related to pain. There was conflicting advice from the websites; for example, load management was comprised of rest, doing non-weightbearing exercises and using symptoms to guide activity. Some websites recommended early

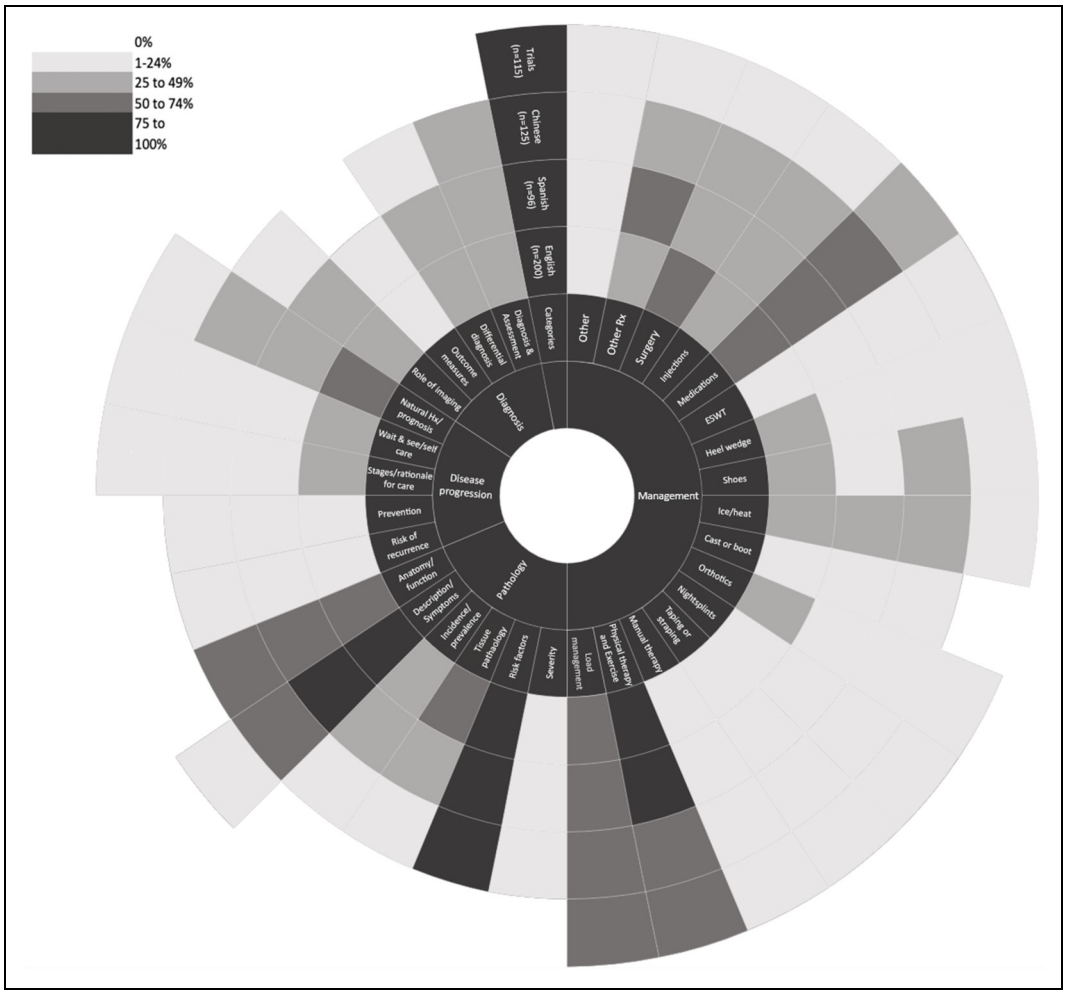

Figure 2. Sunburst chart of the types and frequency of education across countries.

intervention, and sometimes with messages that could be misleading (if this injury is left untreated, it could eventually progress to a complete Achilles tendon rupture), whereas others suggested treatment is only needed if symptoms do not improve. There were conflicting, vague or incorrect messages about how treatments work (e.g. taping or strapping may unload the tendon, allow a stressed muscle to rest, reduce pain and improve function). Some sources mentioned the potential risk of rupture with steroid injections, but the effectiveness of injection therapy for Achilles tendinopathy was not mentioned.

Critical appraisal of Achilles tendinopathy education content

On average, the reliability and quality of education in all languages using the DISCERN tool were poor (average 1.8 out of 5 [5 = minimal shortcomings]). The relevance of the education was the highest score on average (3.6 out of 5) which equates to partially achieve. There were also high scores for explaining (an average of 3.4 out of 5) and achieving the aims (an average of 3.4 out of 5) but only for the Chinese websites. The lowest scores related to the risks of treatment (1.3 out of 5), whether

Table 1. Content analysis of education by category (pathology, disease progression, diagnosis, management) and subthemes. Information sources are provided in brackets for source: websites in English (E), in Spanish (S), in Chinese (C), as well as for randomised controlled trials (T) in English.

Pathology	
Anatomy/function description	The Achilles tendon is a large tendon which attaches the calf muscles to the bony heel of the foot. It is made up of dense collagen fibre and is covered by paratenon, a fibrous layer of tissue that provides the blood supply to the tendon [C, E, S]. Your Achilles tendons not only point your toes (plantarflexion) but propel you forward in explosive movements, such as sprinting, diving, jumping, or cycling [C, E, S].
Description/Symptoms	Achilles tendinopathy 'is a clinical diagnosis that presents as a pain in the tendon at the lower portion of the back of your calf, or at the back of your heel [E]' [C, E, S, T]. It can affect the middle (mid-portion) or insertion (insertional) component of the tendon and involve surrounding structures such as the bursa or sheath (peritendon) [C, E, S]. It was previously termed Achilles tendinitis and is often described as inflammation of the tendon [C, E, S], however 'research has shown is not inflammatory in nature, as previously thought [E]' [C, E, S]. It has also been described as microtrauma to the tendon [E]. Commonly reported symptoms include pain at or above the heel, morning pain or stiffness that improves with movement, and pain when starting to exercise that gradually eases during the activity. Common clinical findings include pain on palpation of the tendon, crepitus heard with movement, and a tender bony lump at the back of your heel known as a sign of Haglund's deformity. [C, E, S]
Incid/prev	Achilles tendinopathy 'is most common in people between the ages of 30 and 50 years, however, it can occur at any age. It is more common in men than women and can affect both athletes and people who are not as active [E]' [C, E, S]. It is associated with 'runners, and in sports which jumps, and intensity changes are frequent [S]' [C, E, S]. 'About 6 in 100 inactive people develop Achilles tendinopathy at some point in their lifetime [E]', in runners Achilles tendinopathy has 'a prevalence of more than 50% and an annual incidence of 7% to 9% [S]' [C, E, S].
Tissue path/pathogenesis (includes pathology description of terms)	AT is a process of degeneration or inflammation as a result of overuse [C, E, S], poor biomechanics [C, E, S], poor recovery [E], or when the demand placed on the Achilles tendon is greater than its ability to function [C, E, S]. This results in disorganisation of the tendon fibres and/or micro-tearing of the tendon and swelling, weakening the tendon [C, E, S]. This process might involve the tendon sheath and/or irritation of the retrocalcaneal bursa [C, E, S], and involve calcification of the tendon [C, E, S] or an increase in blood vessels causing pain [S]. More recently Achilles tendinopathy is 'thought to be a better term to use because it is thought that there is little or no inflammation that causes the problem [E]' [C, E, S], and 'one such model of describing tendinopathy is called the tendon continuum and was described by Cook & Purdam in 2008 [E]'. This model outlines three stages to tendinopathy - reactive tendinopathy, tendon disrepair, and degenerative tendinopathy. [E, S]
Aetiology or risk factors	Intrinsic: Genetics [E, S], increased age, male, increased weight, systemic conditions such as diabetes or Rheumatoid arthritis, as well as, foot posture, lower limb biomechanics, and calf tightness or weakness [C, E, S].

(continued)

Table 1. Continued.

Pathology	
	Extrinsic: Medication use (such as fluoroquinolone antibiotics), footwear, activity type (involving running and/or jumping), training errors including lack of warm-ups, training surface [C, E, S], as well as, diet (such as high in fats) [E, S] and smoking [E].
Severity	Severity can be defined by imaging [E], symptoms including pain, functional impact, and tendon swelling [C, E], time (acute, subacute, chronic) [C], structures involved or reactive/disrepair [E]. Severity will often guide treatment [E, S], though it is important to note that 'pain doesn't relate to the severity of your injury [E]'.
Diagnosis	
Outcome measures	Clinical outcomes might include functional tests hop and heel-raise endurance tests, range of motion - ankle dorsiflexion, subtalar joint, plantar flexion strength and endurance, static arch height, forefoot alignment, and pain with palpation [E]. Patient-reported outcome measures might include: Victorian Institute of Sports Assessment (VISA-A) [E], the Lower Extremity Functional Scale (LEFS) - not specific to Achilles tendinopathy [E], and the Foot and Ankle Ability Measure (FAAM) questionnaire [E].
Role of imaging	Imaging can be used to 'will help contextualize the extent of your tendon damage [E]' and 'used to confirm clinical suspicion or to rule out other musculoskeletal disorders [C]' [C, E, S]. X-ray, Magnetic resonance imaging (MRI), Ultrasound (US) [C, E, S] or computed tomography (CT) [E, S] might be recommended. However, 'an ultrasound or other scan such as an x-ray or MRI may be done to help identify the problem, but this is usually not needed [E]'.
Diagnosis & Assessment	Achilles tendonitis is diagnosed primarily through a physical examination of the injury and medical history. Imaging tests may be necessary to assess the injury and rule out other injuries [E]'. Medical history might include contributing factors 'such as a sudden increase in training volume or intensity' [E], as well as symptoms [C, E, S]. Physical examination might include palpation, functional testing, observation, and 'range of motion testing, strength, and flexibility [E]' [C, E, S].
Differential diagnosis	Differential diagnosis includes local structures such as 'retrocalcaneal bursa, paratenon, plantaris tendon, accessory soleus, fat pad [S]', as well as Haglund's deformity [C, E, S]. It is important to identify a complete Achilles tendon rupture [C, E, S], as well as any systematic conditions such as inflammatory arthritis (for example, rheumatoid arthritis or gout) or fibromyalgia [E, S], or lumbar spine referral [E, S].
Management	
Load management / including RICE	A period of rest is recommended and during this time RICE (rest, ice, compression, and elevation) might be helpful [C, E, S, T]. However, '… that doesn't mean you need complete bed rest. There are other activities you can do that don't affect the injured tendon [C]'. [C, E, S, T]. Activity modifications might include avoiding or reducing aggravating activities (such as running and jumping), switching to lower impact activities such as bike riding or swimming [C, E, S, T], or minimising training errors [C, E]. When returning to activity it is important that load be gradually increased [C, T], 'if a gradual load is being applied to the

(continued)

Table 1. Continued.

Pathology	
	tendon without it reaching past breaking point, the tendon will adapt to the load applied and become stronger and more tolerable to stronger stimuli [E]'. During this time, pain can be used to measure the response to load [C, E, S, T].
Physical therapy and Exercise (including stretching)	Physiotherapy and exercise might target strength, stretching [C, E, S, T], range of motion [E, S, T], balance and proprioception [C, S, T], aerobic conditioning, and include advice and education [E, S, T], and gait re-education [E, T].
	Strength training might include isometric [E, S, T], eccentric [C, E, S], concentric [T] or plyometric contractions [C, E, S, T], and might target the calf or include the entire lower limb [C, E, T]. 'Exercise that gradually increases the load through the tendon over time has been shown to be the most effective treatment for Achilles tendinopathies. This should be done progressive way to avoid flaring symptoms [E]' [C, E, S, T].
Manual therapy	Manual therapy [C, E, S, T] may help with damaged tissues [E], muscle tension or length [S, T], pain [E], and improve joint motion and function [E].
	Soft tissue massage (acupressure, myofascial release, trigger point therapy,) [C, E, S, T] including self-administered [E], may help to reduce pain and improve mobility and function [E], reduce swelling [E, S], increase blood flow [C, E, S], reduce muscle tension [E, S]. There are conflicting ideas about massaging the tendon itself with deep friction massage [C, E, S, T] or avoiding it [C, E]. 'A decrease in pain does not equal healing, and massage does not evoke a healing response in tendons – it's just not how the pathology works.' [E]
	Joint mobilisation [E, S, T] may help to increase foot and ankle function [E], promote blood flow and tendon relaxation [C]. However, there is no clinical evidence but there is expert level consensus to support the use of joint mobilizations in the acute stage and a small amount of clinical evidence in the chronic stage [E].
	Achilles tendon traction [C].
	Self-management instruments including foam roller [C, E, S], massage stick [C], massage ball/tennis ball [C], fascia gun or knife [C]. 'It is important to relax the tight Achilles tendon, but this method does not cure the symptoms, and we cannot completely cure Achilles tendonitis by this method alone.' [C]
Taping or strapping the foot	Taping or strapping [E, S, T] may unload the tendon [E], allow a stressed muscle to rest [E], and reduce pain and improve function [T]. Tape could be applied to the Achilles tendon [E], the ankle [E, S] or foot [E].
	Other forms of taping or strapping included kinesiology tape [AUS, C, S], ankle bracing [C, E, S], and compression bandaging [C, E, S].
Night splints	Night splints [C, E, S, T] may prevent calf muscle tightness [C, E], provide a prolonged stretch to the Achilles tendon [E] reducing tendon tension [S], and help with pain [C, E].
	There is no reliable evidence to suggest night splints improves pain or function in patients with mid portion tendinopathy [E]. However, there is expert opinion to support the use of night splints and braces in the acute stage and a moderate amount of evidence against the use of night splints and braces in the chronic stage [E].

(continued)

Table 1. Continued.

Pathology	
Orthotics	Orthotics [C, E, S, T] were recommended to help correct biomechanics and 'over-pronation/flat feet' subsequently reducing pain and the stress or pressure on the tendon [C, E, S]. The involvement of a Podiatrist was also recommended [C, E, S].
Cast or boot	In more severe cases immobilisation might be used to reduce symptoms [C, E, S]. This might be in the form of a cast or brace [C, E, S] or walking boot [C, E, S]. However, prolonged immobilisation should be avoided [E, C].
Ice/heat	Ice was recommended after activity to help relieve pain and swelling/inflammation [C, E, S, T]. The time recommended varied from 10 min [C, E, S] to 40 min [C, E, S]. Heat was also recommended [C, E, S] prior to activity [E] or prior to bed [C]. Heat could be used in combination with ice [C, E], however, heat may also 'increase inflammation' so should be used 'in moderation' [E].
Shoes	Wearing supportive footwear with good shock absorbency is important [E]' [C, E, S, T]. This includes addressing any issues regarding biomechanics [E, S] and 'shoes that have a slightly raised heel reduce the strain on the Achilles tendon [E]'. Avoid walking in bare feet [C, E, S], high heels [C, E], flat shoes [E, S], hard-soled shoes [C, E], tight-fitting shoes [C, S], and 'that causes friction and compression in the heel area [S]' [C, E, S].
Heel wedge/pads	Heel lifts or wedges [C, E, S, T] were recommended to help with pain [E] and tension or strain on the achilles tendon [C, E, S]. Heel pads were recommended [C, E, S, T] as were heel cups [E, S] to reduce friction or rubbing [C, E, S]. However, 'helps with symptom relief (see image below), but this does not address the underlying cause of your Achilles tendon pain' [E] and may only be appropriate in the acute phase [S].
ESWT	Extracorporeal shockwave therapy [C, E, S, T] may help promote healing and reduce pain [C, E, S], and also to help dissolve calcifications [S]. There is conflicting information regarding the supporting evidence for ESWT from strong [E, S], to some/growing [E], to not yet enough [E]. ESWT might be more effective when combined with exercises [C, E] or orthotic therapy [E].
Medications	Oral medications such as an analgesics and anti-inflammatories might be recommended [C, E, S, T] to reduce pain [C, E, T] and inflammation/swelling [E], and speed up recovery [C, S]. Analgesics included non-opiodal and opiodal [T]. Non-steroidal anti-inflammatory drugs (NSAIDS) are the most likely recommended [C, E, S, T] particularly in the acute stage [C, E]. NSAIDs shouldn't be used for more than 14 days, as they may 'reduce the ability of the tendon to heal in the long term [C, E]. Other medications include topical nitroglycerin patches [E, S, T], topical anti-inflammatory [C, E, S, T] & hirudoid cream [E], and hormone therapy [C, E].
Injections	Various types of injections were mentioned including steroid/cortisone [C, E, S], platelet-rich plasma [C, E, S, T], autologous blood [C, E, S], prolotherapy [C, E, S], saline [C, E, T], stem cell therapy [E, S], hyaluronic acid [C, T], and local anesthetic [T]. Some injections target the inflammatory response such as cortisone [C, E],

(continued)

Table 1. Continued.

Pathology	
	while others such as PRP promote healing [C, E, S]. However, the 'evidence to support injection therapies is poor [E]' [C, E].
	Complication such as an increased risk of rupture need to be considered [C, E]. Injections should only be considered once initial interventions have failed [C, E, S] 'Injection is only considered when chronic pain seriously affects patients who can walk, and drugs and rehabilitation treatments are ineffective.' [C]
Surgery	Surgery might be considered if conservative management has failed after 6 months [C, E, S, T]. Surgery might involve tendon debridement or repair with or without a tendon transfer [C, E, S], calcaneal tuberectomy [C, E, S, T], or gastrocnemius recession [C, E]. The type of surgery might depend on 'the extent of the injury, the patient's age and activity level, and other factors' [E].
	Most patients will have good results following surgery [E], however, the success rate varies from approximately 70% [C, E] to 80–90% [E].
Other Rx	This includes ultrasound, laser therapy [C, E, S, T], nutrition and weight management, and acupuncture/dry needling [C, E, S]. As well as, smoking cessation [C, E, S], iontophoresis [E], electrical stimulation [C, E, S, T], hypnotherapy [E], traditional Chinese medicine [C, S], magnetotherapy [C, S], tecartherapy [S], topical creams/oils [E], percutaneous Intratissue Electrolysis (EPI) [E], intrasound [T] and education [E, T].
Other, including strategies for adherence	Adherence strategies might include exercises diaries [E, T], digital logs [T], adherence questionnaires [T], or goal setting [E]. 'Goal setting in the short, medium and long term provides a useful framework to fall back on when compliance/adherence or life gets in the way of best-made plans.' [E]
	Other strategies might include variations in aerobic exercise [E, T] and running gait [E], and pain education [E, T] such as 'pain is a response from our in-built alarm system'.
Disease progression	
Natural Hx/prognosis	Achilles tendon 'healing time is often relatively long and slow [C]' [C, E], however, 'most people recover from Achilles tendonitis without any lasting effects [E]' [C, E, S, T]. This can vary from a few weeks to 6–18 months [C, E, S]. This could be influenced by management approach, age, medication use [E], or weight [E].
	Conservative (or non-surgical) management, including exercise, is successful in between 60–90% of cases [C, E, S, T]. This might be influenced by early intervention [E, S]. Subsequent surgical treatment is successful in 75–100% of cases [E]. 'If this injury is left untreated, it could eventually progress to a complete Achilles tendon rupture [S]' [C, E, S]. 'With a variety of treatments both non-surgical and surgical, it is possible to treat this condition, and restore normal life activities [S]'.
Wait and see or self-care	Whilst 'some cases [of Achilles tendinopathy] may be treated with self-care [C, E, S, T], others will require medical attention [E]' [C, E, S]. 'People who notice a popping or snapping sound at the time of injury should see a doctor immediately [E]', as they may have ruptured their Achilles tendon [E, S].
	Seek care if pain is impacting your daily life [E], if pain is not improving [C, E, S] or worsening [T], or if you have increased risk factors [E].

(continued)

Table 1. Continued.

Pathology	
	The sooner the injury is treated, the sooner recovery and return to sporting activity will be achieved [S]' and 'it is important to treat your injury early to prevent further damage to the tendon and surrounding tissue [E]' [C, E, S].
Stages and rationale for care	Treatment 'should always begin by being conservative [S]' and aims to reduce the risk of further injury, manage the pain, and return the tendon to normal function [E]' [C, E, S, T]. Treatment strategies might be decided based on length of time or severity of injury [C, E, S], symptoms [C, E], cause [E, S], or location [E, S]. If self-management is not improving the condition, then seeking advice from a health professional, such as a physio, recommended, and if conservative treatments are unsuccessful then further interventions such as injections or surgery may be indicated [E, S].
Prevention (including recurrence)	Key prevention strategies include continued strengthening and stretching and reducing training errors such as rapid changes in load or early return to sport following initial injury [C, E, S], as well as, ensuring 'warm-up and cool-down' exercises are completed [C, E, S], and that 'aggravating shoes should be modified or discarded [E]' [C, E, S]. However, 'preventing an Achilles tendon pain is not always possible [E]' [E, S].
Risk of recurrence	Prevention strategies might help to reduce the risk of recurrence after initial injury [C, E, S]. 'However, symptoms can take up to 1 year to improve in some people. It is also normal to have periods of increased pain or flare ups during your recovery [E]'.

Abbreviations: AUS = Australia; C = China; S = Spain; UK: United Kingdom; USA: United States of America.

shared decision-making support was provided (1.3 out of 5), the option of no treatment (1.2 out of 5) and the effect of treatment on quality of life (1 out of 5). Across the 385 websites, only 36% of DISCERN items on average scored as minimal shortcomings (5), and only 6 websites (2%) achieved a score of 5 for ≥75% of items (Figure 3). The summary of DISCERN findings is shown in Table 2.

Websites were less likely to be scored adequate for actionability criteria (28%) compared to understandability criteria (59%) using the PEMAT tool. Most education contained only relevant information (n = 323, 84%), used easy-to-understand numbers (n = 327, 85%), did not contain calculations (n = 377, 98%), broke up information into short sections (n = 362, 94%), presented it in a logical sequence (n = 320, 83%), used headers (n = 327, 85%) and visual cues (n = 296, 77%) that reinforced the content (n = 312, 81%), and provided at least one action the user could take (n = 304, 79%). Few sources of education made the purpose clear (n = 100, 26%), provided a summary (n = 54, 14%), used simple tables (n = 12, 3%) or explained how to perform suggested actions (items 22,23,24,25,26 achieved by 1% [n = 4] to 25% [n = 96]). Education in Chinese language websites was more likely to use a common language (n = 89, 86%) and education in Spanish language websites was less likely to explain medical jargon (n = 13, 20%) or use an active voice (n = 17, 27%) than their counterparts. Across the 385 websites, an average of 45% of PEMAT items were scored as adequate (highest for Chinese websites) and 20 (5%) were adequate for ≥75% of PEMAT items (Figure 3). The PEMAT findings are shown in Table 3.

Appropriate use of all terminology in the clinical guidelines (Achilles tendinopathy, tendinosis, tendinitis and tears) was low (2.5% [n = 10] to 8.9% [n = 34] of sites). Most sources did not mention the terminology 'Achilles tendinopathy' (n = 244, 63.5%), 'tendinosis' (n = 290, 75.3%) or 'tear'

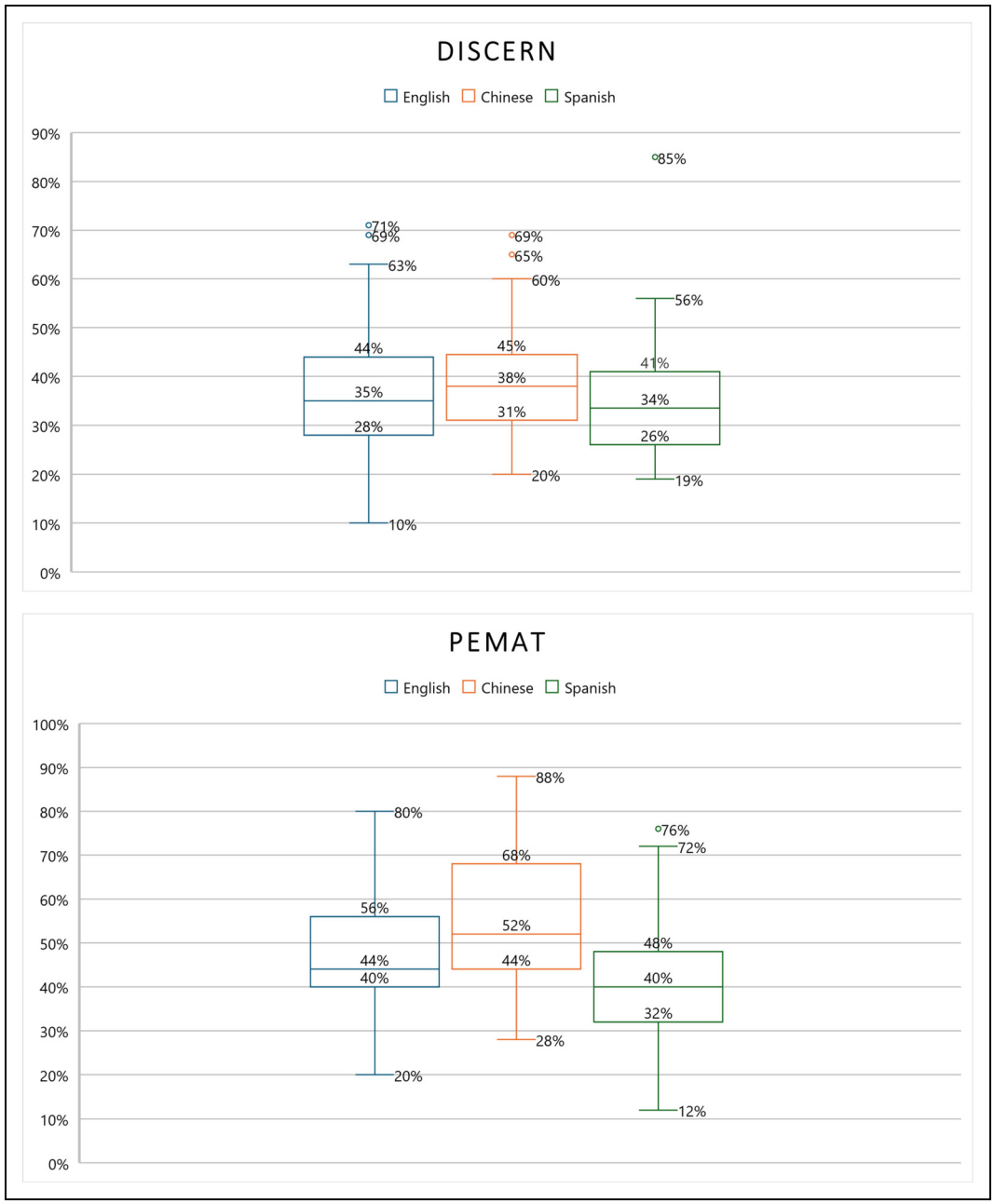

Figure 3. Boxplot distribution of scores for DISCERN, PEMAT, terminology, and guideline appraisal. PEMAT: Patient Education Materials Assessment Tool. (continued)

(n = 296, 76.9%). 'Tendinitis' was the most used term across all languages and half used it inaccurately or misleadingly (n = 208, 54.1%). The average terminology items met across all websites was only 13% (lower for Chinese websites [n = 6, 6%]) and only two websites (one English and one Spanish)

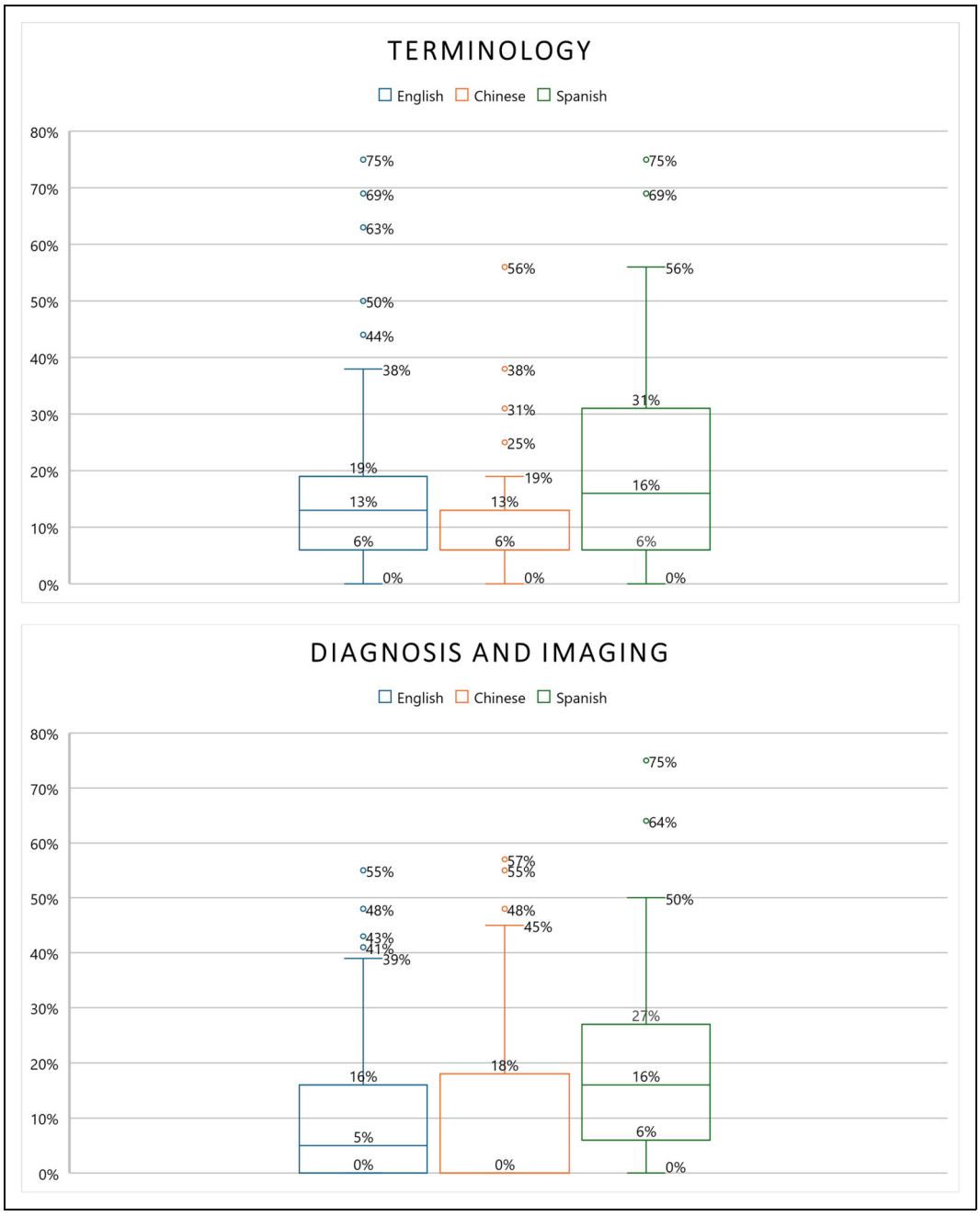

Figure 3. Continued.

met ≥75% of all terminology items. Alignment with terminology clinical guidelines is shown in Supplementary File 4.

Most education did not mention diagnosis or imaging (n = 302, 78.4%) and those which did were often only partially accurate, and the

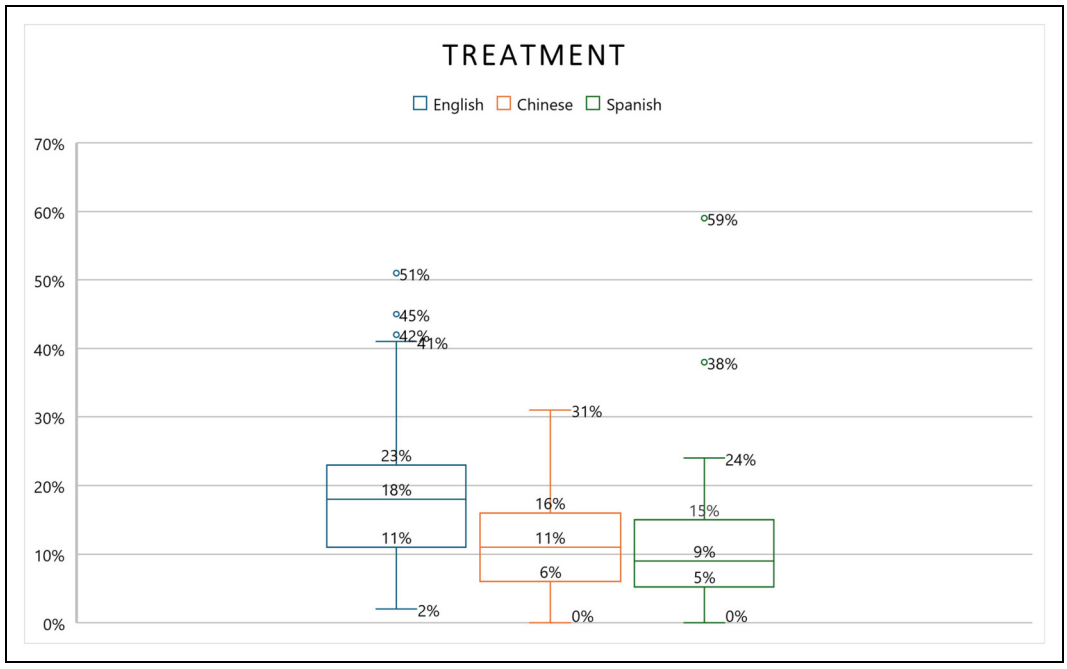

Figure 3. Continued.

description lacked clarity (n = 46, 11.9%). Only 7% (n = 27) of diagnosis items were met across all websites (higher for Spanish [n = 10, 16%] compared with Chinese [n = 0, 0%] and English [n = 11, 5%] websites) and only one Spanish website met ≥75% of all terminology items (Figure 3). Alignment with diagnosis and imaging clinical guidelines is shown in Supplementary File 5.

Most covered treatment topics included education on terminology (n = 280, 72.8%), symptoms (n = 316, 82.1%), calf strengthening (n = 231, 60.1%) and temporary cessation of pain-provoking activities (n = 244, 63.5%), but this information was often incomplete or misleading (n = 178, 46.3%; n = 179, 46.6%; n = 204 53%; n = 125, 32.4%, respectively). Many topics were not mentioned by most websites, including education about tailoring exercise (86.9% [n = 335] to 93.5% [n = 360] across items), limited improvements are expected in the short term (n = 340, 88.4%), prognosis/treatment course (n = 283, 73.6%), pain (e.g. not well correlated with imaging) (n = 341, 88.6%), biopsychosocial factors (n = 377, 97.8%), details of load management (replacement with non-provocative activities [n = 278, 72.1%], gradual increase of load [n = 275, 71.4%], use of a pain monitoring model [n = 360, 93.5%]), to perform calf strengthening for at least 12-weeks (n = 327, 84.9%) and items related to rationale for additional treatments (n = 316, 82.0% to n = 349, 90.7%). Adjunct treatments were also commonly not described (n = 272, 70.6% to n = 363, 94.4%) aside from heel lifts and other passive treatments, although commonly the description was partial or lacking clarity (n = 118, 30.7% and n = 203, 52.8%, respectively). Only 13% (n = 50) of treatment items were met across all websites (Figure 3) and the best performing site was Spanish website with ≥55% (n = 35) of all treatment items met. Alignment with treatment clinical guidelines is shown in Supplementary File 6.

Only five trials provided patient-facing PDF documents and appraisal of the findings were similarly poor to the websites (Supplementary File 8).

Inter-rater agreement and reliability Agreement of each appraisal item was between

Table 2. Summary of DISCERN findings (1–5 points) on reliability, quality, and overall score.

	English (n = 218)		Spanish (n = 63)		Chinese (n = 104)		Overall (n = 385)	
Items	Mean (SD)	95% CI	Mean (SD)	95% CI	Mean (SD)	95% CI	Mean (SD)	95% CI
Section 1. RELIABILITY								
1. Are the aims clear?	1.8 (1.4)	[1.6, 1.9]	2.2 (1.5)	[1.9, 2.5]	3.4 (1.1)	[3.2, 3.6]	2.4 (1.5)	[2.2, 2.5]
2. Does it achieve its aims? (do not answer if there are no clear aims, i.e. NA)	1.2 (2.1)	[0.9, 1.5]	1.5 (1.9)	[1.1, 1.9]	3.4 (1.3)	[3.1, 3.5]	2.0 (2.0)	[1.8, 2.2]
3. Is it relevant?	4.0 (1.0)	[3.9, 4.1]	3.1 (1.4)	[2.8, 3.4]	3.3 (1.0)	[3.2, 3.5]	3.6 (1.2)	[3.5, 3.7]
4. Is it clear what sources of information were used to compile the publication (other than the author or producer)?	1.6 (1.2)	[1.5, 1.8]	1.6 (1.2)	[1.3, 1.8]	1.4 (0.9)	[1.2, 1.6]	1.5 (1.1)	[1.4, 1.7]
5. Is it clear when the information used or reported in the publication was produced?	1.8 (2.0)	[1.6, 2.1]	2.1 (1.7)	[1.8, 2.5]	1.3 (0.9)	[1.2, 1.5]	1.7 (1.7)	[1.6, 1.9]
6. Is it balanced and unbiased?	2.8 (1.2)	[2.6, 3.0]	2.3 (1.2)	[2.1, 2.6]	2.0 (1.0)	[1.9, 2.2]	2.5 (1.2)	[2.3, 2.6]
7. Does it provide details of additional sources of support and information?	2.3 (1.5)	[2.0, 2.5]	1.6 (1.3)	[1.4, 1.9]	1.4 (1.1)	[1.3, 1.6]	1.8 (1.4)	[1.7, 2.0]
8. Does it refer to areas of uncertainty?	1.5 (1.0)	[1.4, 1.7]	1.3 (0.7)	[1.1, 1.4]	1.6 (1.0)	[1.4, 1.8]	1.5 (1.0)	[1.4, 1.6]
Average total score of reliability	2.1 (0.8)	[2.0, 2.2]	2.0 (0.8)	[1.8, 2.1]	2.2 (0.6)	[2.1, 2.3]	2.1 (0.7)	[2.1, 2.2]
Section 2. QUALITY								
9. Does it describe how each treatment works?	2.1 (1.2)	[1.9, 2.2]	2.1 (1.2)	[1.8, 2.3]	1.9 (1.1)	[1.7, 2.0]	2.0 (1.2)	[1.9, 2.1]
10.Does it describe the benefits of each treatment?	2.3 (1.3)	[2.1, 2.5]	2.0 (1.1)	[1.8, 2.3]	1.9 (1.1)	[1.7, 2.1]	2.1 (1.2)	[2.0, 2.2]
11. Does it describe the risks of each treatment?	1.4 (0.8)	[1.2, 1.5]	1.1 (0.3)	[1.0, 1.1]	1.2 (0.6)	[1.1, 1.3]	1.3 (0.7)	[1.2, 1.3]
12. Does it describe what would happen if no treatment is used?	1.3 (0.9)	[1.2, 1.5]	1.2 (0.6)	[1.0, 1.3]	1.1 (0.5)	[1.0, 1.2]	1.2 (0.7)	[1.2, 1.3]
13. Does it describe how the treatment choices affect overall quality of life?	1.0 (0.4)	[1.0, 1.1]	1.1 (0.5)	[1.0, 1.2]	1.0 (0.2)	[1.0, 1.1]	1.0 (0.4)	[1.0, 1.1]
14. Is it clear that there may be more than one possible treatment choice?	2.4 (1.2)	[2.3, 2.6]	2.0 (0.9)	[1.8, 2.2]	2.6 (1.3)	[2.4, 2.8]	2.4 (1.2)	[2.3, 2.5]
15. Does it provide support for shared decision-making?	1.3 (1.0)	[1.2, 1.5]	1.1 (0.5)	[1.0, 1.2]	1.3 (0.8)	[1.2, 1.4]	1.3 (0.8)	[1.2, 1.4]
Average total score of quality	1.7 (0.6)	[1.6, 1.8]	1.5 (0.5)	[1.4, 1.6]	1.6 (0.5)	[1.5, 1.7]	1.6 (0.5)	[1.6, 1.7]
Section3. OVERALL AVERGE								
Average total score for each language	1.9 (0.6)	[1.8, 2.0]	1.8 (0.6)	[1.6, 1.9]	1.9 (0.5)	[1.8, 2.0]	1.9 (0.5)	[1.8, 1.9]

English data include data from Australia, United States, and United Kingdom.
1 = no, 3 = partially, 5 = yes.
CI = Confidential Interval; SD = Standard Deviation.

Table 3. Summary of PEMAT findings with the average (%yes) for websites in English, Spanish, Chinese, as well as an overall average.

Items	English (n = 218)	Spanish (n = 63)	Chinese (n = 104)	Overall (n = 385)
Understandability				
Topic: Content				
1. The material makes its purpose completely evident	20.3	43.8	24.0	25.7
2. The material does not include information or content that distracts from its purpose.	90.2	68.8	82.4	84.4
Topic: Word Choice & Style				
3. The material uses common, everyday language.	40.9	52.1	85.6	52.1
4. Medical terms are used only to familiarise audience with the terms. When used, medical terms are defined.	44.6	19.8	52.8	41.3
5. The material uses the active voice.	68.3	27.1	80.0	62.4
Topic: Use of Numbers				
6. Numbers appearing in the material are clear and easy to understand.	89.9	58.3	97.6	85.1
7. The material does not expect the user to perform calculations	97.4	97.9	100.0	98.0
Topic: Organisation				
8. The material breaks or "chunks" information into short sections.	97.8	84.4	93.6	94.3
9. The material's sections have informative headers	86.7	80.2	82.4	84.5
10. The material presents information in a logical sequence	80.2	80.2	96.0	83.4
11. The material provides a summary	13.9	10.4	20.0	14.4
Topic: Layout & Design				
12. The material uses visual cues (e.g. arrows, boxes, bullets, bold, larger font, highlighting) to draw attention to key points	86.1	59.4	69.6	77.4
Topic: Use of Visual Aids				
15. The material uses visual aids whenever they could make content more easily understood have figure (e.g. illustration of healthy portion size)	49.0	51.0	58.4	51.3
16. The material's visual aids reinforce rather than distract from the content	78.8	70.8	95.2	80.5
17. The material's visual aids have clear titles or captions.	23.8	28.1	40.8	28.1
18. The material uses illustrations and photographs that are clear and uncluttered.	41.3	45.8	48.8	43.7
19. The material uses simple tables with short and clear row and column headings.	2.1	5.2	5.6	3.4
Average Agreement Rate of Understandability	59.5	52.0	67.8	59.4
Actionability				
20. The material clearly identifies at least one action the user can take.	83.2	57.3	87.2	78.8
21. The material addresses the user directly when describing actions.	62.0	33.3	55.2	54.9
22. The material breaks down any action into manageable, explicit steps.	17.3	31.3	44.0	25.4
23. The material provides a tangible tool (e.g. menu planners, checklists) whenever it could help	13.4	2.1	15.2	11.5
24. The material provides simple instructions or examples of how to perform calculations.	1.0	0.0	2.4	1.1
25. The material explains how to use the charts, graphs, tables, or diagrams to take actions.	8.5	2.1	8.8	7.3
26. The material uses visual aids whenever they could make it easier to act on the instructions	15.9	9.4	35.2	18.4
Average Agreement rate of Actionability	28.8	19.3	35.4	28.2

English data include data from Australia, United States, and United Kingdom.
PEMAT: Patient Education Materials Assessment Tool.

90% and 100% (lowest for DISCERN, which has 5 categories) and Kappa coefficients showed strong agreement for terminology and moderate agreement for all other tools. The reliability of each appraisal item is shown in Supplementary File 9.

The top 10 websites according to DISCERN, PEMAT and the alignment with the clinical guidelines for each language are provided in Supplementary File 10.

Discussion

Our scoping review aimed to identify education that people with Achilles tendinopathy can access via public websites as well as patient education provided within (randomised controlled trials). Four of 15 pre-defined categories contained no education from any randomised controlled trial (tissue pathology, outcome measures, severity and prevention) whereas every category was covered by the websites. Descriptive summaries of websites contained conflicting advice for some categories. The secondary aim was to appraise the quality of public website education content for Achilles tendinopathy as well as dedicated patient-facing education materials (e.g. patient leaflets) contained within trials. Quality and reliability of education were poor, with low scores for explanation of treatment risks and shared decision-making. There was a lack of actionability and moderate understandability of the texts. Alignment with clinical guidelines was low, with key information commonly omitted (e.g. the relationship between pain and pathology, appropriate use of the term 'Achilles tendinopathy', and education about treatment expectations and prognosis).

Recommendations from clinical guidelines[4–6,21] are mostly missing in public website educational material and when they do feature, the information is often described partially which could be misleading for patients and members of the public. People with Achilles tendinopathy have previously highlighted their desire for information about their condition and that they do not understand the prognosis of the condition, which may lead to frustration and feelings of disenfranchisement.[25,26] Education about the possible persistent nature of Achilles tendinopathy and how this may affect decisions, such as how long to persist with an exercise-based intervention, the utility of adjunct treatments and the role of medication was rarely discussed in adequate detail. Also rarely discussed but commonly linked to a person's persistence with exercise programmes, were psychological and psychosocial factors.[27,28] Researchers, clinicians and people with tendinopathy agree that measuring the psychological and psychosocial constructs of kinesiophobia, pain beliefs, pain-related self-efficacy and fear-avoidance beliefs is important in clinical trials.[29] However, education about how to address such factors is lacking. Supporting patients through the impact of psychological and psychosocial factors is valued by patients[26] and therefore should be included in educational sources for Achilles tendinopathy in the future. These findings are similar to other areas of musculoskeletal pain, such as osteoarthritis and low back pain, where patients often present with misinformed beliefs about their condition which could be influenced by increasing use of internet-based resources containing inaccurate information.[30–33]

We could not identify websites that provide complete, clear and trustworthy information of high quality for patients with Achilles tendinopathy. Comprehensive web-based resources have been developed in other areas of musculoskeletal pain which can be used as templates for the development of appropriate tendinopathy-related educational content. Resources such as the web-based Translating Research Evidence and Knowledge (https://myknee.trekeducation.org/) 'My Knee' education and self-management toolkit for people with knee osteoarthritis have been developed using a co-design and evidence-based approach.[34] Similarly, painHEALTH™ (https://painhealth.csse.uwa.edu.au/about/) is an Australian web-based resource co-designed with consumers, for consumers to support the self-management and co-care of their musculoskeletal pain. This highlights the need not only for educational resources for people with Achilles tendinopathy, but also the need for co-designing web-based resources with greater involvement of stakeholders including people with tendinopathy, health professionals, and experts/researchers and governmental agencies.

This scoping review has several limitations. First, while we evaluated a broad range of online sources,

many public websites focused solely on specific aspects of Achilles tendinopathy, such as exercise, and were rated lower for not covering other important areas like diagnosis or pathology. Second, our review did not encompass other educational formats such as videos, podcasts, infographics, or artificial intelligence tools (e.g. ChatGPT), as this is beyond the scope of our review. Feedback from the 10 patients we consulted revealed a clear preference for websites over other formats, which shaped our decision-making process. Third, while we aimed to be comprehensive by including sources in English, Chinese, and Spanish, educational materials in other languages were not considered, limiting the generalisability of our findings to a global audience. Fourth, the alignment with the existing clinical guidelines is complex to assess for some topics, due to the lack of substantial research evidence. Nonetheless, the most recent clinical guidelines were the best foundation that we could select as a comparator. Fifth, given the large volume of data in this scoping review we required a large team of reviewers extracting data into pre-defined categories. There is certainly variability in approaches between people which is demonstrated by the less than perfect agreement and Kappa scores. Sixth, while participant-facing documents from randomised controlled trials were included in our review, only five of the 119 trials shared the specific documents used. This limited the number of documents available for appraisal. The reasons for this lack of transparency remain unclear, but it presents a significant barrier to replicating and utilising the same educational materials in clinical practice. Finally, since our website search was completed in August 2023, any new content published thereafter was not appraised and may affect the conclusions of this review. Note that we did update the search for research publications in October 2025 and added five trials.

In conclusion, this review highlights significant limitations in the quality, reliability, understandability, actionability and alignment with the clinical guidelines of Achilles tendinopathy education material found in public websites and in randomised controlled trials. Currently available information may mislead individuals, potentially resulting in inappropriate, time-consuming or costly treatment decisions. Health professionals should be cautious when directing patients to low-quality online resources that do not adhere to evidence-based practices and a proactive approach can be used by health professionals to discuss online content with patients. There is a clear need to develop accurate, co-designed educational resources that reflect best practices and address the informational needs of people with Achilles tendinopathy, to support informed decision-making and better patient outcomes.

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Ethics approval was not necessary for this study.

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Not applicable.

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Author contributions

PM, AM, SMA, RC, KGS and RJdV were responsible for the conception and design of the study. PM, RC, WBC,

JD, TF, DR, SS, ST, MP, HS, IS, JJ, SMA and AM were responsible for extracting and appraising the data. PN was responsible for analysing and creating visuals of the data. JB and PM were responsible for drafting the initial manuscript, which was edited and approved by all authors.

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Supplemental Material

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