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Original article

Greek physiotherapists' contemporary knowledge and practice for lateral elbow tendinopathy: An online survey

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ABSTRACT

Objectives: To investigate physiotherapists' current knowledge and practice in the management of patients with lateral elbow tendinopathy, to explore associations between the participants' education and management preferences and to identify potential evidence-to-practice gaps by making comparisons with recent research recommendations.

Design: An on-line cross-sectional survey.

Subjects: Registered physiotherapists working in Greece with previous experience in the management of lateral elbow tendinopathy.

Results: Three hundred and seventy eight responses met the inclusion criteria. Most responders (70.4%–91.5%) use pain provocation tests for the diagnosis of the condition, while a limited proportion uses patient rated outcome measures (6.9%–13%). Supervised exercise is the mainstay of rehabilitation (92.6%), followed by adjunctive research recommended treatment techniques such as manual therapy (72%) and advice (59.5%). Up to 83.6% of participants use adjunctive treatment techniques that are not recommended or without research recommendation (such as electrophysical agents, ice etc.). Physiotherapists with post-graduate education in musculoskeletal physiotherapy are almost three times more likely to choose only research recommended treatment approaches. There is a lack of consensus in an optimal exercise programme (type, volume, duration etc.) in patients with lateral elbow tendinopathy.

Conclusion: Despite research recommendations a limited use of patient rated outcome measures in lateral elbow tendinopathy is recorded. Supervised exercise is the first line treatment option for most physiotherapists, although the optimal application is still unclear. A large proportion of physiotherapists apply adjunctive treatment techniques that are either ineffective or poorly researched suggesting a substantial evidence-to-practice gap. Better access to knowledge, organisational and peer-support can potentially help to bridge this gap.

1. Introduction

Lateral elbow tendinopathy (LET) or 'tennis elbow' is the most usual source of pain in the elbow causing significant disability, functional decline and increased work loss, especially in chronic conditions (Shiri et al., 2006; Tosti et al., 2013). The prevalence of LET fluctuates between 1% and 3% in the general population and can reach up to 29% in certain occupations or sports activities that involve repetitive wrist movements (Shiri and Viikari-Juntura, 2011). The clinical diagnosis of LET relies on the presence of pain in the area of the lateral epicondyle, loss of grip strength and positive pain provocation tests, namely the Cozen's, Mill's

or Maudsley's tests (Karanasios et al., 2021a). Differential diagnoses usually include cervical radiculopathy, radial nerve entrapment, elbow arthritis or systemic diseases such as rheumatoid arthritis (Bisset and Vicenzino, 2015; Harland and Livadas, 2020). Although the clinical presentation of LET is clear, the complex pathophysiological mechanisms involved make the management of the condition difficult (Bisset and Vicenzino, 2015; Haahr and Andersen, 2003).

Extensive reported data suggest that conservative management is the first-line treatment for LET patients (BatemanTitchenerClarkTambe, 2017; Karanasios et al., 2020; Lian et al., 2019a). Initial management commonly includes activity modification and/or oral non-steroid

; LET, Lateral Elbow Tendinopathy; PROM, Patient Rated Outcome Measures.

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anti-inflammatory medication (Bisset et al., 2011). When symptoms persist, low and very low quality evidence suggests that supervised exercise programmes with or without physiotherapy are more effective than corticosteroid injections or other 'passive' interventions at 6 or 12-months follow-up (Karanasios et al., 2020). However, the effect of exercise in pain reduction and disability is small and a significant proportion of patients seem to respond adequately even to a wait-and-see policy at one-year follow-up (Bisset, 2006; Karanasios, 2020; Smidt, 2002a). At the same time, despite limited or inconclusive evidence for the effectiveness of specific interventions in LET such as corticosteroid injections, orthoses, deep transverse friction massage combined with Mill's manipulation (Stasinopoulos and Johnson, 2004), acupuncture, high and low-intensity laser (Lian et al., 2019a; Long et al., 2015; Karanasios et al., 2021b; Stasinopoulos, 2021) they remain very popular in clinical practice (Harland and Livadas, 2020; BatemanTitchenerClarkTambe, 2017). A survey report (BatemanTitchenerClarkTambe, 2017) among UK practitioners including physiotherapists, surgeons and occupational therapists has identified a significant evidence-to-practice gap in the management of the condition, reporting that up to 27% of responders select second-line treatment options (corticosteroid injections, extracorporeal shockwave therapy and acupuncture). Similarly, a recently published systematic review (Zadro et al., 2019) of physiotherapy management of common musculoskeletal conditions suggests that only 54% of physiotherapists (in 23 surveys) choose recommended treatment methods while up to 81% of physiotherapists (in 37 surveys) select non-recommended treatments. The evidence-to-practice gap is a critical factor in wasting healthcare resources and preventing patients from receiving appropriate care (Lin et al., 2020). Previous reports on the clinical management of LET among physicians, physiotherapists and hand therapists have recorded participants' first and second-line diagnostic strategies, treatment choices and views on evidence in the UK, Sweden, Ireland, Italy and the USA. (Harland and Livadas, 2020; BatemanTitchenerClarkTambe, 2017; MacDermid et al., 2010; Cioce et al., 2020; Peterson et al., 2005a) To our knowledge, reports on the extent of the evidence-to-practice gap for both diagnosis and treatment of LET in the Greek population are missing.

Appropriate physiotherapy management of people with LET may have a significant impact on cost-effectiveness and treatment outcomes (Coombes et al., 2016; Sanders et al., 2016). Evaluating physiotherapists' perceptions and clinical practice and exploring whether they reflect on up-to-date recommendations can potentially help to spot evidence-to-practice gaps. Subsequent actions bridging research evidence and clinical practice can reduce ineffective procedures and improve healthcare quality in the current field. Our study aimed to i) investigate physiotherapists' current knowledge and practice of LET, ii) explore associations between the participants' education, management preferences, number and frequency of sessions delivered and iii) make comparisons with recent research recommendations.

2. Methods

A cross-sectional study design was used following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (von Elm et al., 2008). An online anonymous survey was developed and disseminated via the Google Forms platform. Participants completed an informed consent form before proceeding to the main section of the survey. Ethical approval was granted by the University of West Attica Ethics Committee (38311-9/6/2020).

2.1. Participants

The survey link was broadcast via the Panhellenic Physical Therapy Association newsletter, the physiotherapy departments of all Greek universities and physiotherapy groups on social media. It was available online for three months from June 2020 to September 2020. The

participants should be registered physiotherapists working in Greece with previous experience in the management of LET. Participants without previous experience in the management of the condition or those who had not been registered were excluded from data analysis. Based on a sample size calculation with a 95% confidence level and a margin of error of 5% (total registered physiotherapists in Greece = 8869), a sample of 369 participants was considered adequate for the generalisability of the study results (Barlett et al., 2001).

2.2. Survey design

Three physiotherapists (PS, SK and GG) with more than 20 years of clinical and academic experience in the assessment and management of the condition developed initial survey items. The items were developed according to previous surveys, one about hand therapists' perceptions of assessment and treatment strategies (MacDermid et al., 2010) for LET and another among surgeons and physiotherapists about first and second-line treatment suggestions for the same condition (BatemanTitchenerClarkTambe, 2017), current evidence and clinical expertise. Another expert panel that consisted of three academic researchers (AC, VS and MM) and two clinicians (IS and VK) in musculoskeletal physiotherapy proceeded independently to assess item-content relevance. They were asked to evaluate the initial survey items, using a 10-point rating scale from poor (1) to excellent (10), on content relevance and phrasal clarity and to provide feedback and suggestions. The results from item-content relevance were quantified using Aiken's V statistic for judges rating, which was found to be 0.948 for the 31 items of the survey. All feedback from the panel of experts was discussed among the authors until a final consensus for each item was reached (Dunn et al., 1999). The survey instrument was subsequently piloted by 30 physiotherapists (11 males and 19 females) with a mean (standard deviation) age of 32 (± 8.36) years which revealed two minor errors related to the use of specific terms in Greek requiring re-editing for the final survey version.

The final survey (Supplementary Material 1) consisted of two sections: one with demographic and professional characteristics (Items A1-15) and another related to the physiotherapy management of LET (Items B1-16). The second part included seven questions involving the stage at which physiotherapy is considered necessary, and examination tests, outcome measures, clinical reasoning parameters (research evidence, experience, doctors' instructions, etc.), treatment techniques (exercise, manual therapy, electrophysical agents, etc.), frequency and expected length of treatment, respectively. Two questions related to the criteria which were considered most important to form the treatment plan for patients with LET (pain, chronicity, disability, etc.). Three questions included clinical decision making and selection of exercise parameters for a clinical vignette of a patient with LET. Three questions related to the current knowledge of exercise parameters (type, load, frequency, volume, equipment, etc.) were used in the current patient group. One question related to the overall satisfaction of the treatment outcomes. Three questions related to the most recent source of information, when it was acquired and satisfaction of the responder's knowledge about the condition, respectively. Participants with missing answers in the second section of the survey were excluded from the data collection. The majority of the questions were answered by checking boxes, combined with open-ended questions to ensure content validity (Burton and Mazerolle, 2011).

2.3. Data analysis

All data were analysed using SPSS 25 (IBM Corp., Armonk, NY, USA) and Microsoft Excel. Open-ended questions were assessed and recoded into categories by two researchers (PS and SK) who worked collaboratively. In cases of dispute, a third researcher was consulted (GG). Sociodemographic information and physiotherapy management responses were reported in counts or percentages.

Without published guidelines in the management of LET, two authors (PS and SK) searched the best available evidence for assessment strategies and interventions. An electronic search was conducted using the terms ‘lateral elbow tendinopathy’ ‘OR’ ‘tennis elbow’ ‘AND’ the name of each assessment or treatment technique. The identified literature was graded according to the Oxford Levels of Evidence, (OCEBM Levels of Evidence Working Group) with the highest available level of evidence providing the grade of recommendation (Guyatt et al., 1995) for assessment strategies and interventions. Grade A recommendation indicated strong evidence, B indicated moderate evidence, C weak evidence, D conflicting evidence, E theoretical/foundational evidence and F expert opinion (Guyatt et al., 2008). Subsequently, the available physiotherapeutic strategies were categorised as recommended, not recommended or with an inconclusive recommendation based on the available grade of recommendation. Therapeutic strategies graded A, B and C for their effectiveness were categorised as “recommended”, those graded D were categorised as with “inconclusive recommendation” and therapeutic strategies with evidence of grades E and F or with grades A, B and C against their effectiveness were categorised as “not recommended”. These indications were used to evaluate if the physiotherapists’ responses were in line with the evidence-based recommendations for the management of the condition.

The relationship between the level of education, the frequency and the total number of sessions and recommended/not-recommended management was tested using Pearson’s Chi-square and Fisher’s exact tests. The alpha level of significance was set at 0.05, while Bonferroni adjustments were included for multiple comparisons. An odds ratio with 95% confidence intervals was used for dichotomous variables.

3. Results

3.1. Participants’ characteristics

From a total of 416 physiotherapists, 21 participants were excluded due to not being registered as physiotherapists in Greece, 15 for not having previous experience in LET management and two for incomplete survey items. Consequently, 378 participants were included in the final analysis. Their demographic and clinical practice characteristics are shown in Table 1.

Most of the participants were <49 years of age (91.3%), with less than 15 years of experience (71.7%) and working in private practice (90.5%). The majority of the responders (79.6%) had attended a life-long learning course related to the management of LET in the past, while one-third of them (32%) had a master’s or PhD degree. More than two-thirds (76.5%) of the participants reported managing more than 19 patients with LET per year.

3.2. Diagnostic tests/outcome measures used

Most physiotherapists use a range of pain provocation tests for the diagnosis of LET, including palpation of the lateral epicondyle (91.5%), Cozen’s (84.7%), Mill’s (74.3%) and Maudsley’s (70.4%) tests. Usually reported outcome measures include pain evaluation scales (65.1%), the pain-free grip strength test (57.1%), the Patient Rated Tennis Elbow Evaluation (13%) and Disability of Arm, Shoulder and Hand Questionnaire (6.9%). A significant proportion of participants (27.5%) suggested inappropriate examination tests or outcome measures such as the Neer’s test or Oswestry Disability Index. The frequency of examination tests and outcome measures used by the participants are shown in Table 2.

3.3. Treatment approaches used

Most physiotherapists (86.2%) suggest that an early physiotherapy intervention (in the first three weeks from the onset of LET symptoms) is most effective. Supervised exercise is the preferred therapeutic approach (92.6%), followed by manual therapy (72%) and advice (59.5%).

Table 1
Physiotherapists’ demographic and professional characteristics.

	N	Frequency (%)
Gender		
Not Specified	111	29,4%
Male	163	43,1%
Female	104	27,5%
Age		
20–29	136	36%
30–39	129	34,1%
40–49	80	21,2%
50–59	31	8,2%
60 +	2	0,5%
Graduation Year		
<2001	77	20,4%
2002–2018	292	77,2%
2019 >	9	2,4%
Post Graduate Degree		
Yes	121	32,0%
No	257	68,0%
Life-long Educational Program Related to LET		
Yes	301	79,6%
No	77	20,4%
Years of Experience		
1–5	130	34,4%
6–15	141	37,3%
16 or more	107	28,3%
Work Setting		
State	36	9,5%
Private	342	90,5%
Main Field of Interest		
Musculoskeletal	303	80,2%
Other	75	19,8%
LET Cases Per Year		
0–9	163	43,2%
10–19	127	33,6%
20–29	53	14,0%
30–39	15	4,0%
40+	20	5,3%
Regions of Practice		
Attica	204	54%
Thessaloniki	34	9%
Ioannina	14	3,7%
Achaia	10	2,6%
Evia	10	2,6%
Rest of Greece	106	28,1%
Patients Treated Daily		
1–5	70	18,5%
6–10	132	34,9%
11–15	102	27%
16–20	37	9,8%
20+	37	9,8%

Abbreviations: LET: lateral elbow tendinopathy.

Physiotherapists with a master’s or PhD degree were almost three times (odds ratio = 2.796; 95% confidence intervals: 1.406 to 5.557) more likely to use recommended interventions in the management of LET. A substantial proportion of physiotherapists use adjunctive treatment approaches with inconclusive recommendations such as transcutaneous electrical nerve stimulation (65.3%), bracing/taping (39.4%), low-level laser therapy (34.9%), extracorporeal shock wave therapy (30.4%), magnetotherapy (7.9%), short wave diathermy (7.4%), acupuncture (4.8%) and myofascial treatment techniques (1.6%), while a similar proportion of participants applies not recommended treatment techniques such as transverse friction massage (60.8%), ice (51.3%) or capacity resistive electric transfer therapy (36%). The frequency of the treatment strategies used by the participants is shown in Table 2.

More than half of physiotherapists (54.7%) use three or more sessions per week during the management of their patients, while more than two-thirds (67.6%) require six to ten sessions to discharge them. Physiotherapists that suggest only recommended interventions are almost three times (odds ratio = 0.368; 95% confidence intervals: 0.179 to 0.757) and three times (odds ratio = 0.338; 95% confidence intervals:

Table 2
Physiotherapists' assessment and treatment strategies used in lateral elbow tendinopathy with the indication of research recommendation for their use.

Diagnostic tests or outcome measures	Frequency (%)	Is it recommended?	Grade of recommendation
Lateral epicondyle palpation (Karanasios et al., 2021c)	91.5%	Y	C
Cozen's test (Karanasios et al., 2021c)	84.7%	Y	B
Mill's test (Karanasios et al., 2021c)	74.3%	Y	B
Maudsley's test (Karanasios et al., 2021c)	70.4%	Y	B
Pain scales (Visual Analog Scale, Numeric Rating Scale) (Karanasios et al., 2021c)	65.1%	Y	C
Pain Free Grip Strength test (Smidt et al., 2002b; Stratford and Levy, 1994; Bobos et al., 2020)	57.1%	Y	B
Neer's test	24.1%	–	Irrelevant
Patient Rated Tennis Elbow Evaluation Questionnaire (Evans et al., 2019)	13.0%	Y	A
Disabilities of the Arm, Shoulder and Hand Questionnaire (Evans et al., 2019)	6.9%	Y	A
SF - 36 Questionnaire	4.0%	N/A	–
Oswestry Questionnaire	1.6%	–	Irrelevant
Interventions			
Exercise (Karanasios et al., 2020; Chen and Baker, 2021)	92.6%	Y	A
Advice (Sutton et al., 2016)	59.5%	Y	B
Manual Therapy (Girgis and Duarte, 2020; Lucado et al., 2019)	72.0%	Y	A
Low Level Laser Therapy (Lian et al., 2019a; Dion et al., 2017)	34.9%	Inconclusive recommendation	D
Extracorporeal Shock Wave Therapy (Karanasios et al., 2021b; Yao et al., 2020a; Zheng et al., 2020a)	30.4%	Inconclusive recommendation	D
Bracing (Girgis and Duarte, 2020; Dion et al., 2017; Shahabi et al., 2020; Heales et al., 2020)	39.4%	Inconclusive recommendation	D
Myofascial Treatment Techniques (Ajimsha et al., 2015)	1.6%	Inconclusive recommendation	D
Acupuncture (Zhou et al., 2020; Navarro-Santana et al., 2020; Green et al., 2002; Tang et al., 2015)	4.8%	Inconclusive recommendation	D
Capacity – Resistive Electric Transfer Therapy (e.g. TECAR) (Clijsen et al., 2019)	36.0%	N	E
Ultrasound (Long et al., 2015; Dingemans et al., 2014)	33.9%	Y	B
Magnetotherapy (Bisset et al., 2011)	7.9%	Inconclusive recommendation	D

Table 2 (continued)

Diagnostic tests or outcome measures	Frequency (%)	Is it recommended?	Grade of recommendation
Transverse Friction Massage (Loew et al., 2014)	60.8%	N	A
Short Wave Diathermy (Babaei-Ghazani et al., 2020; Devereaux et al., 1985)	7.4%	Inconclusive recommendation	D
Ice (Manias and Stasinopoulos, 2006)	51.3%	N	C
Transcutaneous Electrical Nerve Stimulation (Dion et al., 2017; Dingemans et al., 2014)	65.3%	Inconclusive recommendation	D

Grades of recommendation: A = strong evidence, B = moderate evidence, C = weak evidence, D = conflicting evidence, E = theoretical/foundational evidence and F = expert opinion. Recommendations: Y=Yes, N=No, N/A = Not available.

0.117 to 0.981) less likely to use >3 sessions per week and >11 sessions for patient's discharge, respectively (Supplementary Material 2).

Research evidence and clinical experience are considered as 'very important' or 'extremely important' factors in clinical decision making for 51.3% and 45% of physiotherapists, respectively. The majority (77.2%) consider doctors' instructions slightly important or not important for their treatment decisions (Fig. 1).

In terms of exercise prescription, pain and disability are 'very important' or 'extremely important' factors for 55.8% and 52.9% of the responders, respectively. At the same time, the symptoms duration and the muscle strength are slightly important factors for 45% and 43.9% of them, respectively. For the exercise parameters, physiotherapists consider that the resistance used and the type of exercise are 'very important' or 'extremely important' factors (51.9% and 47.9%, respectively), while time under load and number of sets/repetitions are 'less important' factors (44.4% and 46%, respectively) (Fig. 2a–b).

A clinical decision vignette was provided to the participants consisting of a patient with LET symptoms for three months, with low or moderate pain and disability. Although the majority of physiotherapists (95.5%) suggested the use of exercise, a substantial proportion of them (up to 34.5%) included a not recommended intervention or one with an inconclusive recommendation as an adjunctive treatment technique. More than half of the physiotherapists (56.4%) proposed a slow (>2 s) eccentric type of exercise for wrist extensors with some of them selecting heavy (38.9%) compared to light (61.1%) resistance Fig. 3a–c.

The physiotherapists' satisfaction with their current knowledge of exercise parameters (equipment, sets, repetitions, time under load, type and resistance) in LET was mainly reported as moderate (43.7%–51.3%). The most usual sources of knowledge about the management of the condition were literature (36.2%) and life-long learning courses (26.7%) acquired during the last two years for most physiotherapists (81.5%). Almost all responders (93.1%) require further education about the management of the condition with research evidence (51.9%) and life-long learning courses (45.5%) being the most preferred means. Notably, about half of them (50.3%) state that they are 'very satisfied' or 'extremely satisfied' with their overall treatment outcomes (Supplementary Material 3).

4. Discussion

The main findings of the present survey suggest that physiotherapists use research recommended examination tests for the clinical diagnosis of LET; however, patient-reported outcome measurements are poorly included in their assessment. Although almost all physiotherapists use recommended interventions as primary treatment approaches, many

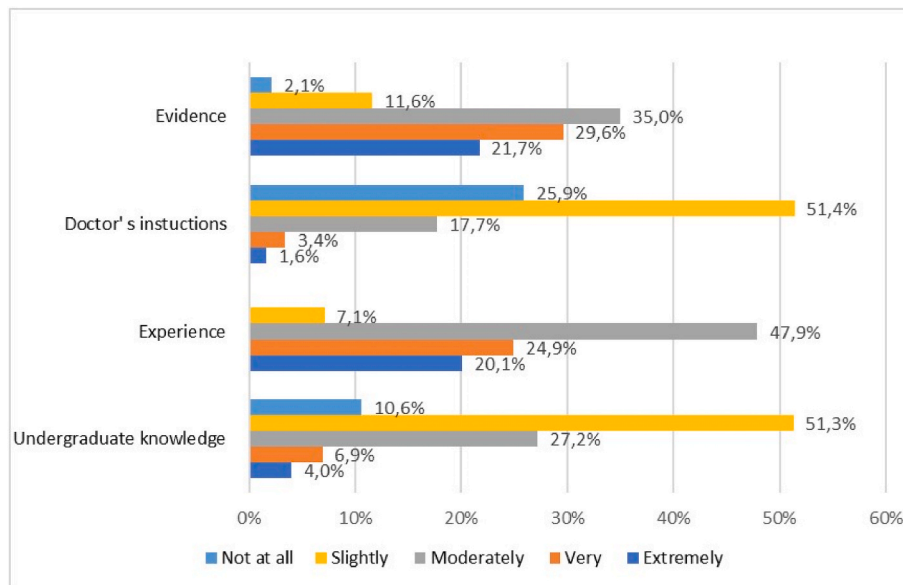


Fig. 1. Participants' perceived importance regarding clinical reasoning factors in lateral elbow tendinopathy patients (Item B4).

physiotherapists still use adjunctive treatment techniques with inconclusive recommendations or without recommendations. A substantial evidence-to-practice gap in the management of LET was found, which is similar to previous survey results from clinical practice in the UK (BatemanTitchenerClarkTambe, 2017; Sahbudin and Peall, 2013), Sweden (Peterson et al., 2005b) and Italy (Cioce et al., 2020).

Our results indicate that physiotherapists' clinical diagnosis is in line with contemporary research evidence including the most common and accurate pain provocation tests (i.e., palpation, Cozen's, Mill's and Maudsley's tests). (Karanasios et al., 2021a).

Based on our findings, the use of valid and reliable patient-rated outcome measures such as the Patient-Rated Tennis Elbow Evaluation Score and the Disability of the Arm Shoulder and Hand Questionnaire in patients with LET was limited (4% and 13%, respectively). In comparison with other countries, an Italian survey reported a larger proportion of physiotherapists using the same assessment tools in patients with elbow pain (38.12% and 57.81% respectively) (Cioce et al., 2020). Utilising patient-reported outcome measurements in clinical practice has been identified as a critical factor in monitoring health problems more effectively and bridging the communication between clinicians and patients (Valderas et al., 2008). However, different barriers affect their routine use by health professionals, such as the lack of prior knowledge and experience using outcome measures, and organisational or peer support (Duncan and Murray, 2012). Although our survey did not evaluate the reasons for not using such tools in patients with LET, similar factors may be present in the Greek population as most responders reported the need for further knowledge and education in assessment and management strategies of LET through the literature and additional educational courses.

Similar to previous reports (BatemanTitchenerClarkTambe, 2017; MacDermid et al., 2010; Cioce et al., 2020), supervised exercise was the first-line treatment option for almost all physiotherapists surveyed (92.6%). Even more responders (95.5%) selected an exercise programme for the management of the included clinical scenario reflecting adequately the research recommendations for the conservative management of the condition (Karanasios et al., 2020; Chen and Baker, 2021). However, half of the physiotherapists said they were only moderately satisfied with their knowledge of exercise parameters. Notably, a dispute was shown in the selection of exercise parameters between concentric and eccentric or light and heavy resistance, respectively. Our findings are in line with published research reports

showing no benefit in using one exercise type compared to another (i.e., concentric vs eccentric/concentric, etc.) (Karanasios et al., 2020; Ortega-Castillo and Medina-Porqueres, 2016; Peterson et al., 2014). The lack of consensus on the most appropriate exercise programme is possibly reflected in the wide variability in physiotherapists' views about the most important factors during exercise prescription in LET, such as patient reported-outcomes, muscle strength and chronicity (Fig. 2a-b).

A recently published systematic review and meta-analysis (Karanasios et al., 2020) of exercise effectiveness in patients with LET identified that none of the 30 eligible randomised controlled trials provided complete information on the exercise parameters used. Studies were missing critical information such as who provided the programme, overall adherence rate, materials (free weights, elastic bands, etc.), load, time under load and rest times used. Similarly, the physiotherapists surveyed showed variable results in the most important exercise parameters (resistance or type used) compared to the less important ones (time under load or number of sets/repetitions), reflecting the lack of research data in the current field.

The most usual adjunctive treatment option reported in the management of patients with LET was manual therapy techniques (72%) following research recommendations (Girgis and Duarte, 2020; Lucado et al., 2019). A systematic review and meta-analysis including 20 randomised controlled trials reported a positive effect on pain and disability compared to control groups for elbow mobilisation techniques (Lucado et al., 2019). Interestingly, according to their results among all manual therapy techniques, only mobilisation with movement in the elbow shows high mean effect sizes in decreasing pain and improving function on all follow-up occasions (Lucado et al., 2019).

A notable finding of our survey was that even though physiotherapists acknowledge the use of recommended interventions in LET, a significant proportion of them use adjunctive treatment approaches with inconclusive effectiveness. Almost two-thirds of physiotherapists reported using transcutaneous electrical nerve stimulation; despite having been considered a pain modulator for a variety of musculoskeletal conditions (Vance et al., 2014), its effectiveness remains unclear (Johnson and Walsh, 2010), especially for LET patients (Dion et al., 2017; Dingemans et al., 2014).

Approximately one-third of the physiotherapists surveyed reported using adjunctive treatment modalities such as low-level laser therapy (Dion et al., 2017; Lian et al., 2019b) and extracorporeal shockwave therapy (Lian et al., 2018; Yao et al., 2020b; Zheng et al., 2020b). In

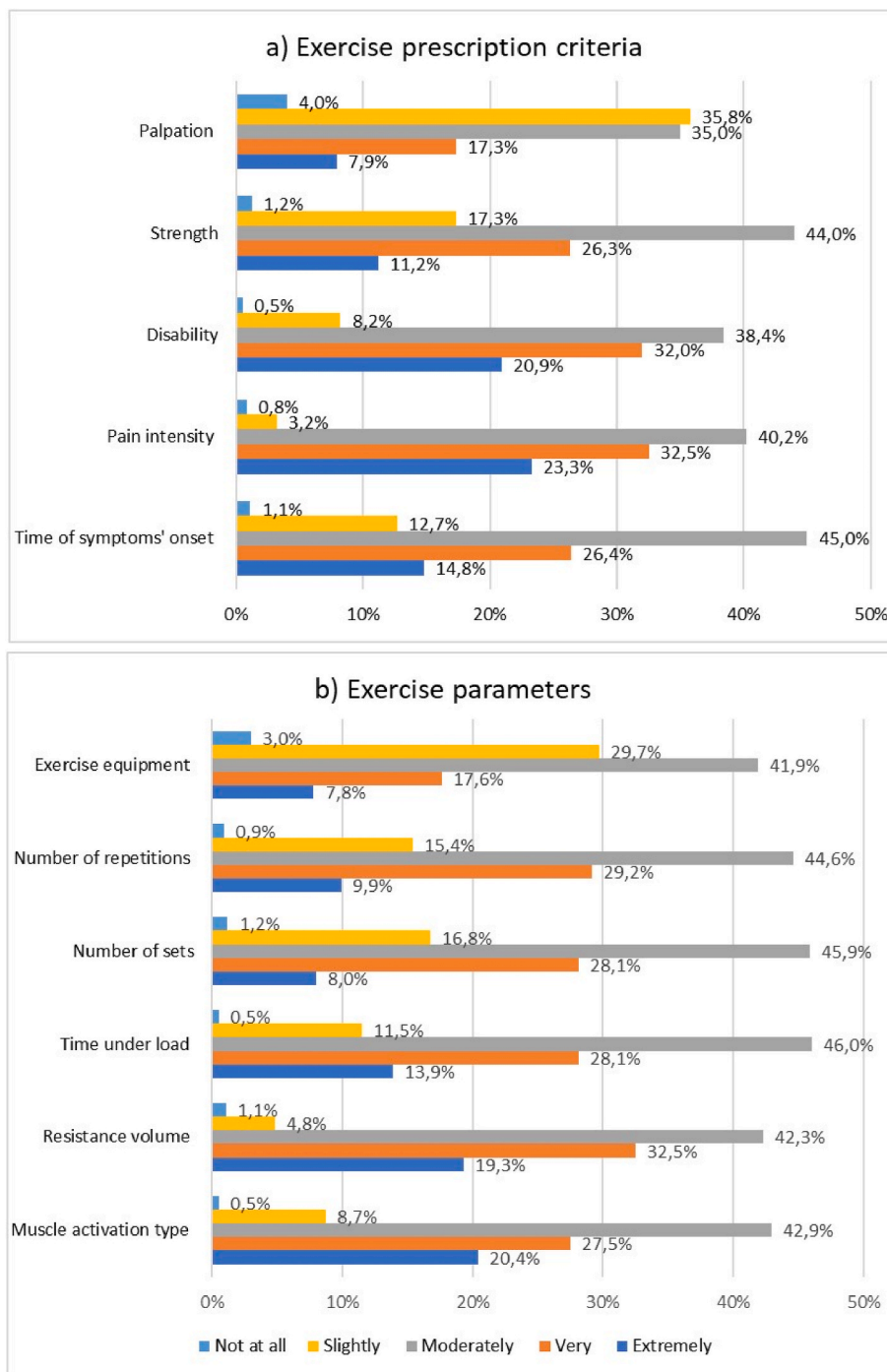


Fig. 2. (a–b): Participants’ perceived importance regarding exercise prescription criteria (Item B8) and exercise parameters (Item B11) in lateral elbow tendinopathy patients.

previous reports, both modalities have been suggested as beneficial for decreasing pain and improving grip strength in patients with LET (Lian et al., 2018; Yao et al., 2020b; Zheng et al., 2020b). However, these reports are criticised for substantial statistical and clinical heterogeneity, while the long-term effectiveness of the current modalities in the management of LET is limited (Karanasios et al., 2021b; Mamais et al., 2018).

About 40% of physiotherapists select bracing or taping, which is similar to the proportion of responders using bracing in the Italian survey (33.7%) (Cioce et al., 2020). Although low-quality evidence exists that forearm orthoses can improve pain free-grip strength immediately,⁴⁵ recently published reports suggest that a counterforce brace or a

wrist splint does not provide better results in reducing pain or improving grip strength compared with physiotherapy or other long-term interventions (Girgis and Duarte, 2020; Dion et al., 2017; Shahabi et al., 2020).

Apart from bracing other treatment options with contradictory effectiveness in LET such as myofascial treatment techniques (Ajimsha et al., 2015), acupuncture (Zhou et al., 2020; Navarro-Santana et al., 2020), magnetotherapy (Bisset et al., 2011) or diathermy (Babaei-Ghazani et al., 2020; Devereaux et al., 1985) are used by only a limited proportion of physiotherapists (up to 7.9%).

A concerning finding from the present survey is that most physiotherapists (up to 83.6%) use at least one adjunctive not recommended

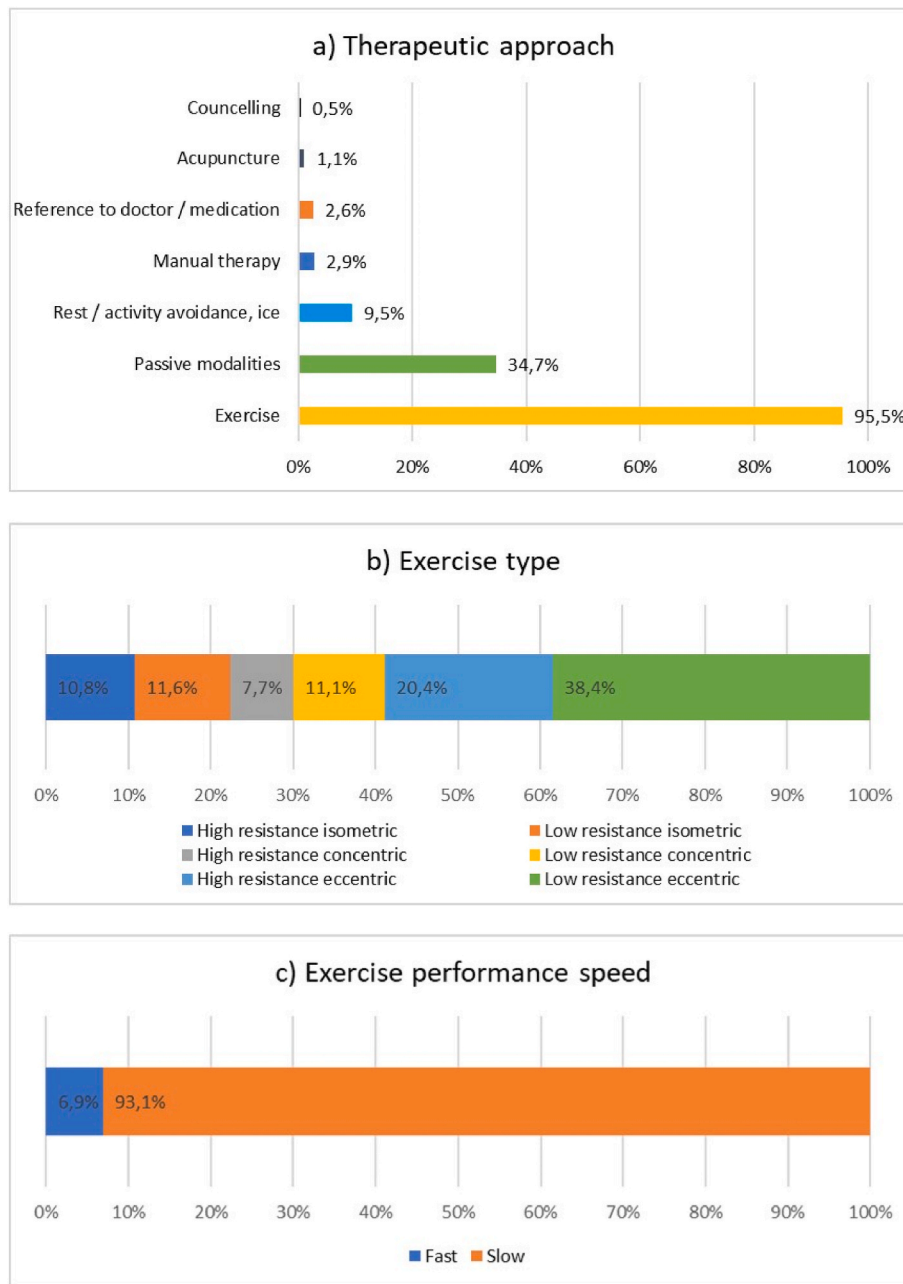


Fig. 3. a–c: Participants’ therapeutic approaches (Item B7), suggested exercise type (Item B9) and performance speed (Item B10) to clinical scenario (LET patient, 3+ months duration of symptoms, low/moderate pain and disability).

treatment technique (i.e. transverse friction massage (Loew et al., 2014) and ice (Karanasios et al., 2020; Manias and Stasinopoulos, 2006)) or a modality that has never been tested for its effectiveness in patients with LET (i.e. Capacity Resistive Electric Transfer Therapy (Clijssen et al., 2019)). We found a much higher proportion of responders using treatment options without solid evidence compared to previous survey results in other countries (up to 27% and 54%, respectively) (BatemanTitchenerClarkTambe, 2017; Sahbudin and Peall, 2013). These discrepancies might be explained by the different sample characteristics as physiotherapists, hand surgeons and occupational therapists were included in one study (BatemanTitchenerClarkTambe, 2017) and rheumatologists in the other (Sahbudin and Peall, 2013).

It seems that our findings are in agreement with a previous review (Zadro et al., 2019) evaluating routine practice in common musculoskeletal conditions (other than tendinopathy) suggesting that 81% of physiotherapists choose treatments that have no recommendation while

43% of them choose treatments that are not recommended at all. Other studies have underlined a similar evidence-to-practice gap reporting the use of evidence-based physiotherapy practice at a rate of 8%–32.8% per week or 20%–65% per month (da Silva et al., 2015). Lack of knowledge, time, and organisational and colleague support have been identified as critical factors for not using evidence-based physiotherapy interventions in daily practice (da Silva et al., 2015; Scurlock-Evans et al., 2014).

Although physiotherapy courses in Greece critically updated their curriculum in 2001 including research methods as a core module, no significant association appeared between the responses by physiotherapists who graduated pre- or post-2001 and the use of recommended management in LET. Nevertheless, the relationship between knowledge and evidence-based practice procedures was reflected in physiotherapists with post-graduate studies (master’s or PhD degree) who were more likely to offer evidence-based management strategies by using i) recommended interventions, ii) less than three sessions per week and iii)

fewer sessions in total when managing patients with the condition.

Concerning organisational and interprofessional factors, most private practitioners in Greece work either alone or in small groups, often without interprofessional support and most of the time having a significant workload. Such organisational circumstances can deprive them of necessary time, infrastructure, interprofessional diversity and shared tools like patient records and standardised forms (Perreault et al., 2014). In addition to the lack of time, domestic clinical guidelines in Greece are missing, which might further explain the limited use of patient-reported outcome measurements or the extensive use of interventions that are not recommended.

Contradictory results were found regarding the overall duration of rehabilitation and satisfaction of treatment outcomes. Based on the literature, the optimal duration of physiotherapy management for most patients with LET is between six and 12 weeks (Bisset and Vicenzino, 2015; Karanasios et al., 2020; Lian et al., 2018). However, most responders treat their patients for two to three weeks, using >3 sessions per week (54,2%) and being 'very satisfied' or 'extremely satisfied' with their treatment outcomes. At the same time, the use of pain scales and disability questionnaires was relatively low, creating more confusion about the source of this satisfaction. Possibly, this paradox is elucidated by the lack of usage of patient-reported outcome measurements, leading to increased bias regarding the treatment effects, or simply due to misinterpretation of LET natural history. Nevertheless, 93,1% of the responders stated that they need further education regarding the management of this patient group, which reflects their uncertainty.

5. Limitations

We acknowledge as a limitation that all data was provided voluntarily by self-selected participants in this study, which could imply a more positive reflection of attitudes and beliefs than in their daily practice (Iles and Davidson, 2006). It should be noted that the majority of the participants are working in private settings while physiotherapists >49 years were underrepresented, affecting the external validity of our survey results. Moreover, an aspect of LET assessment strategies may have not been reflected in this study as participants had no option to add other assessment tools used than the ones mentioned in the related survey item.

Further research evaluating the factors that limit physiotherapists to use evidence-based physiotherapy practice in patients with LET will be beneficial to improve research implications into practice and further enhance healthcare quality services.

6. Conclusion

Most physiotherapists use examination tests supported by evidence for the clinical diagnosis of LET. Nevertheless, the use of patient-reported outcome measures remains low. Supervised exercise is the first-line treatment option for most physiotherapists, although the optimal application is still unclear. A large proportion of physiotherapists apply adjunctive treatment techniques that are either ineffective or poorly researched suggesting a substantial evidence-to-practice gap. Post-graduate education is more likely to result in using research-based interventions and fewer sessions in total. Better access to knowledge, organisational and peer support can potentially help to bridge the evidence-to-practice gap.

Conflict of interest statement

The Authors declare that there is no conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.msksp.2022.102502>.

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