Digital Exercise Interventions (DEIs) for Tendinopathy

A systematic review and narrative synthesis of mobile and web-app delivered rehabilitation.

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Key message: Digital exercise can support short-term tendinopathy rehabilitation, especially when matched to patient complexity and need for supervision.

BACKGROUND

- Tendinopathy causes persistent load-related pain and reduced function.
- Exercise is central to care, but access and adherence remain difficult.
- DEIs may extend support through education, reminders, feedback and remote progression.

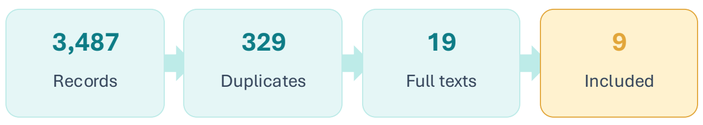
QUESTIONS

1. Do mobile/web exercise interventions improve pain, function, strength and adherence?
2. Which delivery features seem to shape outcomes?

Focus: Synchrony • Platform • Contact time

METHODS

- Databases: MEDLINE, Embase and Web of Science; searched June–July 2025.
- Eligibility: Adult tendon conditions; mobile/web applications prescribing or progressing exercise; clinical outcomes reported.
- Excluded: Post-surgical cohorts, non-tendon studies, no clinical outcomes and non-english reports.
- Quality appraisal: CASP checklists.
- Synthesis: Narrative, tendon-site subgrouping, synchrony subgrouping and effect-direction plots.



RESULTS

9	573	4	8–12w
Included studies	Participants	Tendon areas	Typical follow-up

Tendon site	n	Main Result Findings
Achilles / Hindfoot	3	Consistent pain and function gains across app, hybrid and video-supported formats; fear of movement improved where measured. **Hasani et al. (2021); Post et al. (2023); Çil et al. (2023)**
Rotator Cuff	4	Function, disability, ROM and quality of life improved most with synchronous/video or web-portal support; pain effects were mixed. **Malliaras et al. (2020); Timurtaş et al. (2025); Kaymaz et al. (2025); Zirek et al. (2025)**
Elbow	1	Sensor-guided app cohort showed clinically important pain and QuickDASH improvements with high engagement; no comparator. **Janela et al. (2022)**
Anterior Knee / Patellar	1	Algorithm-driven web app outperformed standard physiotherapy for pain and function at 90 days. **Ferner et al. (2025)**

Effect-direction plot snapshot

↑ favourable ↔ no clear difference ↓ favours comparator

Tendon site	Pain	Function	Adherence	Psychological
Achilles	↑	↑	↑	↑
Rotator cuff	↔/↓	↑	↑	↑
Elbow	↑	↑	↑	↑
Anterior knee	↑	↑	↑	—

Take-Home Synthesis

Works short term — DEIs generally improved pain/function and often matched or exceeded usual care.

Apps support adherence — Apps may improve adherence by reducing barriers and supporting feedback, reminders, and accountability.

Supervision matters selectively — Video or hybrid support looked most useful for rotator-cuff disability, ROM and patient confidence.

Evidence is promising, not definitive — Small samples, short follow-up and heterogeneous outcomes limit firm platform-specific claims.

IMPLICATIONS FOR PRACTICE

Use as a pathway option

Position DEIs as an adjunct or alternative, not a universal replacement for in-person physiotherapy.

Match support to complexity

App-only may suit confident, straightforward cases; video/hybrid may suit complex, fearful or technique-sensitive patients.

Build for real-world access

Further research is required to determine the training, support structures, clinical systems, and safeguarding processes needed to integrate DEIs safely and effectively into routine clinical practice.

Future research: Larger multicentre RCTs • longer follow-up • direct platform comparisons • cost-effectiveness • equity and digital access • patient subgrouping.

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