Digital MSK tools for the workforce: Benefits, challenges and learnings





- The MSK problem
- The evidence
- Digital technologies for MSK health
- What we do at TrackActive digital MSK self-management
- The benefits
- The challenges
- Learnings and future direction





The MSK problem

'Musculoskeletal (MSK) problems remain the most frequent reason why individuals are absent from work, including those with workrelated musculoskeletal disorders (WRMSDs or MSDs) and those with chronic MSK problems.'

Joanne O. Crawford, Danielle Berkovic, Jo Erwin, Sarah M. Copsey, Alice Davis, Evanthia Giagloglou, Amin Yazdani, Jan Hartvigsen, Richard Graveling, Anthony Woolf, Musculoskeletal health in the workplace, Best Practice & Research Clinical Rheumatology, Volume 34, Issue 5, 2020,







Evidence of exercise interventions

'There was strong evidence for one intervention category, resistance training, leading to the recommendation: Implementing a workplacebased resistance training exercise programme can help prevent and manage UEMSD and symptoms. The synthesis also revealed moderate evidence for stretching programmes, mouse use feedback and forearm supports in preventing UEMSD or symptoms.'

Van Eerd D, Munhall C, Irvin E *et al*, Effectiveness of workplace interventions in the prevention of upper extremity musculoskeletal disorders and symptoms: an update of the evidence, *Occupational and Environmental Medicine*, Published Online First: 08 November 2015. doi: 10.1136/oemed-2015-102992

'There was strong evidence of a positive effect of strength training. This resulted in the following message for stakeholders: Recommendation. "Implementing strength training at the workplace can help reduce MSD among workers with physically demanding work."'

Sundstrup, E., Seeberg, K.G.V., Bengtsen, E. *et al.* A Systematic Review of Workplace Interventions to Rehabilitate Musculoskeletal Disorders Among Employees with Physical Demanding Work. *J Occup Rehabil* 30, 588–612 (2020).







Evidence of exercise interventions

'The findings of the RCTs on workplace exercise interventions suggest that interventions were effective in treating musculoskeletal disorders among office workers.

Marangoni's study,³⁴ found that with regard to the duration of the exercise programme, performing strength exercises in the workplace three times a week for 20min could reduce musculoskeletal pain in the different regions of the spine and upper limbs.'

Tersa-Miralles C, Bravo C, Bellon F, et al, Effectiveness of workplace exercise interventions in the treatment of musculoskeletal disorders in office workers: a systematic review, BMJ Open 2022;







Strength training is the most effective way to prevent and manage most MSK conditions

But must be appropriate (personalised)







Evidence of digital interventions for MSK conditions

Evidence suggests that digital tools for self-management of low back pain can be effective in reducing pain and improving function

-Smartphone app in self-management of chronic low back pain: a randomized controlled trial - App-based multidisciplinary back pain treatment versus combined physiotherapy plus online education: a randomized controlled trial. -Randomized controlled trial of a 12-week digital care program in improving low back pain - Mobile-Web App to Self-Manage Low Back Pain: Randomized Controlled Trial - Randomized-controlled trial assessing a digital care program versus conventional physiotherapy for chronic low back pain

And also for other MSK conditions / pain

- -Effects of a 12-Week Digital Care Program for Chronic Knee Pain on Pain, Mobility, and Surgery Risk: Randomized Controlled Trial
- Clinical outcomes one year after a digital musculoskeletal (MSK) program: an observational, longitudinal study with nonparticipant comparison group
- Clinical Outcomes After a Digital Musculoskeletal Program for Acute and Subacute Pain: Observational, Longitudinal Study With Comparison Group





Digital tools to prevent and manage MSK pain *can be effective*









Type of MSK digital tools for workforce

- Virtual (video) assessments and programme delivery via apps • Digital self-assessment / checklists / training such as DSE online
- assessments and education
- Al driven wearables and movement analysis assessments and coaching for manual handling and exercise therapy
- Digital triage and assessment tools with referral and signposting +\- self-management programmes





Al driven movement analysis and wearables





Companies such as Solar Analytics (left) have developed wearables and visual recognition tools to quantify risk for manual handling tasks.

Can provide insights and automated recommendations.

However human interpretation is required and the latest research needs to be taken into consideration

"It is likely 'a one size fits all' approach to preventing and managing lifting-related low back pain does not exist, rather a more individualised approach may be required, which may be the subject of future research," Professor O'Sullivan said.

This review shows that training workers in proper MMH techniques and providing them with assistive devices are not effective interventions by themselves in preventing LBP. Proper manual handling techniques to prevent low back pain, a Cochrane Systematic Review









Al driven movement analysis and wearables





- Hinge Health and Sword Health are two of the largest digital MSK clinic providers based in the USA.
- They have developed software as well as wearables and motion detection technology for exercise guidance and pain relief.
- Wearables and motion analysis can provide objective data and potentially help with engagement. Practicality and implementation by large number of users may present challenges.

Digital MSK self-management









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TrackActive Me is a mobile and web-based health application which provides immediate assessment, education and exercise programmes to prevent and self-manage musculoskeletal conditions.

₩ CE Medical Device



Assessment





Employee profiling, triaging and assessments

Digital triage and assessments for MSK conditions can be undertaken within the application.

The user is directed towards the most appropriate care - urgent care, referral to GP, referral to physiotherapist, or self-management.

Employee profiling to determine appropriate prevention based programmes, and DSE online assessment can also be undertaken.







Rehabilitation





Digital self-management programmes

If appropriate for self-management, TrackActive Me devises the most effective rehabilitation programmes based on the likely diagnosis.

Through user input, the application monitors their improvement and modifies the programmes accordingly.

Check-in notifications acts as a safety net to ensure that users engaging with app, and if not improving they are recommended to see a physiotherapist.





Prevention







Personalised strength and mobility programmes

Based on the user's profile, the application can provide a suitable strength and work-place based mobility programme to help prevent musculoskeletal condition.

There is also a library of pilates, yoga, stretching and strengthening options.

All programmes require minimal equipment so they are ideal for doing at home or in the office.





Education





Neck-related Shoulder Pain



It is common, especially for office workers, to experience both neck and shoulder pain. The pain is usually worse around the shoulder blade. It may radiate into the neck or to the point of the shoulder.

There can be multiple reasons for this pain. It can come from the small joints in your neck, the nerves that extend from the neck and down the arm, or due to muscle weakness and tightness.

A poor workplace set-up and reduced exercise and movement throughout the day can contribute to this problem.

There is good news. Research has shown that the following can improve your pain:

- 1. Ensuring your workplace is set up correctly
- 2. Moving your neck and shoulder throughout the day.
- Exercising to strengthen the muscles around your shoulder blade.

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Monitoring and Analytics

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DASHBOARD





Admin Dashboard

Users are able to log symptoms, and programme completion through the TrackActive Me app.

With the admin dashboard, organisations can stay informed and get a snapshot of aggregate usage and progress from anonymised data.



With consent, authorised physiotherapists will be able to view an employee's assessments and programmes that have been completed in the app. This means they can provide continuity of care when needed.





Our challenges in developing a self-help digital MSK solution

- Development and testing to ensure robust assessment pathways and appropriate referrals - Development of decision-making algorithms to provide likely diagnosis and appropriateness for self-management

 - Increasing age requires more consideration of co-morbidities and past medical histories - Regular reviews of outcomes to optimise assessments
- Development of progressive exercise programmes for different diagnosis e.g. knee joint sprain vs knee osteoarthritis
 - Analysis of data sets to optimise programmes
- Accessibility technology needs to be easy to use and also provide options requiring development of web and app options





Benefits of digital triage and self-management

- Provides a convenient and immediate provision of care reducing delayed intervention
- Improved health outcomes 35% reduction in symptoms via digital self-management compared with 28% for face-to-face physiotherapy*
- Evidence-based and non-discriminatory
- Coupled as an education and prevention tool
- Lower cost for employers with limited MSK budgets and resources
- Can be connected / integrated with other digital health or workplace assessment tools (e.g. DSE tool that flags MSK issues)











BT & Marsh going beyond Pilot Study: Service Evaluation

Integrating TrackActive Me into DSE risk management in the workplace

Objective

To review impact of early access to mHealth application aimed at prevention and selfmanagement of MSKrelated symptoms as part of an integrated risk management pathway in the workplace.

Research Question

To understand users experience of engaging with a mHealth application for MSK health self-management in the workplace.

General. Version 1. Health, Safety & Wellbeing CoE. (BT

Aim

1. Insight to user experience / usability.

2. User confidence of using application.

3. Assess pain, disability and functional outcomes.

Methodology

Desk-based employees will be invited to use TrackActive Me application to help assess and treat their MSK health condition.

Analysis

Part A: Quantitative analysis via survey and thematic analysis via focus groups.

Part B: Objective measures on pain, disability, function.



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Challenges of implementing digital **MSK tools for the workforce**

- Choosing an app
- Acceptance
- Engagement
- Linking with existing MSK services
- Multiple healthcare apps





1. Choosing an app

- Evidence-based
- Regulatory e.g. CE UKCA marking
- Is it fit for your purpose and needs?
- Part of your MSK pathway or an optional extra?





2. Acceptance

- Large variation in how employees will perceive it
- Maintaining multiple means for employee to access MSK care not everyone will want to use an app to 'discuss' and manage their condition

'I will be leaving the business at the end of November but I'd love to continue using the TrackActive Me app. The programmes are really helping so I'm worried about losing access. Is there any way I can transferred to a personal account and if so, how much might this be?'

Recommendation from user - 'Option to have physio which I never got despite boss approving it'





3. Engagement

- Prevention programmes appropriate and evidence-based prevention exercise programme delivered through apps can have an impact but how to keep users engaged?
- Super users exist but are they the one who most need it? How do we engage those most at risk?
- Notifications / reminder function

Adherence to exercises is also a problem with traditional physiotherapy





4. Linking with existing MSK services

- When using digital solutions alongside in-person occupational MSK services, the applications needs to be customised to accommodate this.
 - Referral to non-digital MSK services through the app
 - Notifications and access for OH teams

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5. Multiple healthcare apps

- Multiple apps for workers is challenging
- Employee health and wellbeing benefits providers are an option for those without comprehensive OH service
- Digital platforms such as Syndi Health, Healthkey and Pirkx provide the employees with choice
- There could be less control on what apps your employees can access through these platforms





- Digital platforms, implemented correctly, do improve health outcomes and reduce pressure on existing healthcare services
- Where there is no existing MSK support for an employee, digital platforms should be well accepted
- Where there is existing MSK support the app needs to be integrated as part of the existing MSK pathway and connected to physiotherapists in organisations. Don't example, for a front end digital triage and self-management platform it should provide an option to connect with a physiotherapist or OH support.
- Provide portal for practitioners to monitor assessment outcomes and employee progress with self-management
- Future developments to focus more on employment specific outcomes not just health outcomes

Our learnings

replace existing human physiotherapy with an app - it needs to complement it. For

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