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Title: The role of leadership in implementing and sustaining an evidence-based intervention for osteoarthritis (ESCAPE-pain) in NHS physiotherapy services: A qualitative case study

Running head: Leadership in implementing and sustaining an EBI

Article category: Research Paper

Abstract

Purpose: To explore the role of leadership by physiotherapists in implementing and sustaining an evidence-based complex intervention (ESCAPE-pain) for osteoarthritis.

Materials and methods: A qualitative case study approach using in-depth interviews with 23 clinicians and managers from 4 National Health Service (NHS) physiotherapy providers in England between 2016-2017. Data were analysed using thematic analysis.

Results: Different leadership roles and actions were characterised with four themes: (1) Clinical champions – clinicians driving the sustainability of ESCAPE-pain; (2) Supporters - junior clinicians directly supporting clinical champions' efforts to sustain ESCAPE-pain; (3) Senior Manager – clinical champions' senior managers influence on sustainability; (4) Decision-making – (in)formal processes underpinning decisions to (not) sustain the programme.

Conclusions: The study characterises the role of leadership in physiotherapy to sustain an evidence-based intervention for osteoarthritis (OA) within the NHS. Sustaining the intervention required on-going leadership, it did not stop at implementation. Senior specialist physiotherapists (as Champions) had a critical leadership role in driving sustainability. Their structural position (bridging the operational and strategic) and personal attributes allowed them to integrate different levels of leadership (i.e. senior

managers and operational staff) to mobilise the collective, on-going work required for sustaining the programme.

Keywords: Implementation, evidence-based intervention, osteoarthritis, sustainability, leadership

Introduction

Although healthcare professionals understand the need for effective evidenced-based interventions (EBIs), their ability to implement new knowledge into clinical practice is limited [1–3]. Claims that this is due to inadequate description of complex healthcare interventions [4] are sometimes justified, but are often an oversimplification – implementing and sustaining an intervention require more than simply knowing its content and format [5,6]. Raising awareness of the intervention, its benefits and value, overcoming professional and organisational resistance, scepticism and providing sufficient resources (trained staff, facilities, etc) are essential [1–3,5]. Individuals committed to overcoming these barriers are vital in leading change [7–10], ensuring that an intervention delivered has fidelity to the evidence-based intervention thereby reproducing its benefits [11].

Whilst the role of leadership has been identified as critical in implementing and sustaining EBIs in healthcare within implementation theories and frameworks [5,6,12–14], it is rarely examined empirically and is poorly characterised [8,10,15]. Further analysis is needed to understand more about leadership roles and behaviours at multiple levels within organisations in creating contexts receptive to implementing and sustaining EBIs [9,10,16].

This study explored the role of leadership in musculoskeletal (MSK) physiotherapy services to sustain a complex EBI (ESCAPE-pain) for osteoarthritis (OA).

Methods

Study design

A case study approach was taken using semi-structured interviews with physiotherapists involved in implementing and sustaining an EBI (ESCAPE-pain). Within the field of implementation science there is a need to understand more clearly the processes by which innovations are implemented and sustained in relation to specific contexts [8,17]. A case study approach allows an in-depth description and analysis of a specific situation or context [18,19].

The intervention

Enabling Self-management and Coping with Arthritic Pain using Exercise, ESCAPE-pain, is a rehabilitation programme for people with chronic knee and/or hip pain, usually labelled osteoarthritis (OA). The programme delivers core recommendations from a clinical guideline that people receive structured education, self-management advice and individualised, progressive exercise [20]. Groups of 10-12 people attend a 90-minute session, twice a week, for six weeks (i.e. 12x 90-minute sessions), each session is led by a trained facilitator, usually a physiotherapist. Details of the programme are available at <http://www.escape-pain.org/>. Robust evaluation has shown ESCAPE-pain reduces pain, improves physical and mental function, wellbeing and quality of life [21–23]. ESCAPE-pain provides a ‘typical’ example of an evidence-based group rehabilitation intervention combining exercise and education for people with chronic physical conditions [24–26].

Study setting and participants

Four organisations (out of a total of 14) delivering ESCAPE-pain were approached to be case studies. Four organisational case studies were considered feasible and methodologically justifiable [18,19]. Case studies were selected based on:

- Fidelity to ESCAPE-pain: Implemented and delivering ESCAPE-pain as it was described in the original trial [11]
- A National Health Service (NHS) MSK physiotherapy service: Typical setting for an OA intervention and the setting for the original trial.
- 2-years minimum post-implementation: This period is an important threshold for understanding sustainability [12,27,28]
- Convenience: Geographically located within southern England to allow ease of access for multiple site visits.

A senior clinician involved in the implementation of ESCAPE-pain in each provider was approached about participating as a case study. The senior clinicians then consulted with senior managers (such as heads/directors of therapy services). All 4 organisations agreed to participate in a case study.

In the four provider case studies, any individual directly involved in the implementation and/or delivery of the programme was invited to participate. Participants were approached to participate via the head of physiotherapy or service lead. The target was to recruit 4-6 participants per organisation across a range of seniority (i.e. 16-24 in total). There are no definitive rules for sample size in qualitative research [29,30]; however, similar studies have used comparable sample sizes [31–33]. For each organisation, 5-7 managers and clinicians per site (n=23) involved in implementing and/or delivering ESCAPE-pain participated in semi-structured interviews (Table 1).

[Table 1 – Overview of provider organisations and participants]

Data collection

Data were collected in 2016-2017. Each participant was interviewed using an interview schedule to explore the implementation and sustainability of the programme. Table 2 provides a summarised version of the interview schedule topics. Interviews were conducted by AW (a physiotherapist) in private at their workplace or by phone (on request). A key informant from each organisation was interviewed approximately 12 months later to explore aspects of sustainability in more depth [32]. Key informants were the senior clinicians with service management responsibilities that directly oversaw the implementation of ESCAPE-pain and had continued involvement in its delivery post-implementation. Follow-up interviews with key informants explored the topics relating to sustainability outlined in Table 2 with a focus on the changes that had occurred in the intervening time (i.e. what changed for whom, in what context and at what time) [34,35]. In addition, follow-up interviews reviewed specific issues that has been identified in the initial interviews. Interviews lasted an average of 56 minutes, were audio-recorded and transcribed verbatim.

Ethics approval was obtained from the Faculty of Health, Social Care and Education Research Ethics Committee at St George's, University of London and Kingston University. All participants received written information about the study (including its purpose and the researchers' interest in the topic) and assurance of anonymity and confidentiality, before giving written consent.

Data analysis

Data were managed using NVivo 11, inductively coded and analysed using thematic analysis [36]. Analysis began by exploring each individual case study and then compared

across cases. The analysis was led by AW, who undertook the coding. However, the research team (AB and MH) read a sample of interview transcripts and met regularly to discuss the emerging themes as part of the analysis. Overall common themes were repeated suggesting data saturation was reached. Preliminary findings were shared with 187 people involved in delivering ESCAPE-pain at two stakeholder events (including some study participants) to support the analysis. Whilst this prompted questions for discussion, no one contested the findings.

The research team was comprised of an early career clinical-academic physiotherapist (AW: male, PhD), a senior clinical-academic physiotherapist (MH: male, PhD) and a senior academic in healthcare research (AB: female, PhD), all with training and experience in qualitative research. The interviewer (AW) had no prior relationship with participants.

Results

Four themes relevant to leadership roles and activities were identified: (1) *Clinical Champions* - driving the implementation and sustainability of ESCAPE-pain; (2) *Supporters* – junior clinicians directly supporting Champions’ efforts on ESCAPE-pain; (3) *Senior managers* – the influence of those in senior leadership roles on ESCAPE-pain; (4) *Decision-making* - processes underpinning the decisions to (dis)continue the programme. Table 3 summarises the different forms of work (or actions) by the different leadership roles (i.e. Champions, Supporters, and Senior Managers) used to sustain ESCAPE-pain.

[Table 3 – Leadership roles and actions to sustain ESCAPE-pain]

Clinical Champions

Within an organisation initial implementation and internal spread of ESCAPE-pain was driven by Clinical Champions (hereafter, Champions). These were advanced physiotherapy

practitioners in musculoskeletal (MSK) conditions who had influence and autonomy within their service. Typically, Champions reported good external networks, a commitment to improving service delivery and quality care, and awareness of the research and guidance around the management of OA, especially the research underpinning ESCAPE-pain:

“...[Alex] is head of the musculoskeletal therapies...he’s very aware of best practice and he’s got the initiative to drive it too...” (Karen)

“...a few of us had heard about [ESCAPE-pain] and had spoken to [programme originator] a few years back about it but had never done anything with it...I just contacted [originator] and asked him ‘what’s the intention, what’s the plan for getting the programme out into the clinical world?’...” (Ed)

Their close involvement with the implementation and delivery of ESCAPE-pain gave them a detailed understanding of the operational issues that impacted its delivery and effectiveness. They became the key contact to ensure the smooth running of the programme. They encouraged referrals, triaged potential participants, coordinated delivery across sites within an organisation. They ensured the programme was sufficiently resourced, that staff were trained and had capacity to deliver ESCAPE-pain successfully, and if necessary, stepped in themselves to deliver the programme to limit disruption:

“...I oversee the programme being delivered at the various sites across the Trust. ...I liaise with the clinicians, provide support, facilitate dates when those are needed, that sort of thing. And they run the classes, basically. Very occasionally I still get asked to cover if someone is off sick or someone is on holiday” (Dee)

Strategically, Champions helped spread and sustain ESCAPE-pain within their organisations by promoting the programme to senior managers and other clinicians. Because

ESCAPE-pain required more resources than other interventions, senior managers closely monitored the programme. Champions collected outcome metrics to demonstrate its value and effectiveness and tried to protect it from pressures that could have a detrimental impact.

Champions reported a strong sense of ownership for the programme that stemmed from the time and effort spent implementing, delivering and evaluating the programme:

“...I think the reason why I’ve retained oversight is just because I set it up, I’ve got the most detailed knowledge of it...” (Adam)

They described how sustaining ESCAPE-pain required on-going commitment, resilience and perseverance. They used descriptors such as ‘fight’, ‘battle’ and ‘struggle’ when describing their efforts to resist pressures from senior managers and commissioners to adapt or stop the programme. Although senior managers valued Champion’s contribution to improving service delivery and care quality, some saw them as ‘challenging’ people to work with. One Champion thought his efforts to sustain ESCAPE-pain adversely affected his career and contributed to his decision to change organisations:

“...it was a worthwhile thing to do, but it didn't do my career prospects much good...[managerial resistance] is one of the reasons why I’ve been frustrated and one of the reasons that I’m leaving...” (Ed)

Some Champions thought reducing their involvement with ESCAPE-pain would adversely impact the programme, or result in it being discontinued. They feared a gradual drift away from fidelity to the intervention’s ethos, format and content. In particular, they thought pressure to reduce the number of sessions would produce a ‘watered-down’ programme similar to ‘less effective’ interventions previously delivered:

“...[if] I don't keep my eye on it and don't intervene when they're about to do something mad with it, it would just die, would just filter away and die...somebody has to champion that, and own that, keep it driving forward...” (Amy)

If responsibility for overseeing the programme needed to be transferred to another colleague, Champions stated they needed to be confident the colleague understood the programme (i.e. the evidence-based, ethos, key components) and would be committed to sustaining it:

“...I reckon that [colleague] will subscribe to ESCAPE-pain...she's really keen on evidence-based practice...if it went to somebody who wasn't particularly motivated it could fall by the wayside...” (Adam)

However, Champions expressed concerns that not all colleagues recognised that ESCAPE-pain's on-going integration into practice settings required continued effort i.e. ensuring the programme was always delivered with fidelity to the core components and addressing any issues the might disrupted delivery:

“I'm not very confident about the decisions that are being made sometimes around this 'leaving it to work its way through'.” (Amy)

Supporters

The efforts of Champions to sustain ESCAPE-pain within practice settings were assisted by 'Supporters'. Like the Champions, they demonstrated enthusiasm and commitment to ESCAPE-pain, referred to its clinical benefits and enjoyed delivering it. Supporters were cultivated through a combination of factors. Their positive view of ESCAPE-pain was influenced by the clinical credibility of champions and the programme's underpinning evidence-base. This was consolidated by their direct experiences of delivering ESCAPE-pain

in practice and observing the outcomes.

Supporters augmented the efforts of the Champions at an operational level. They were important in helping to maintain the integrity of ESCAPE-pain on a day-to-day level and ensured that ESCAPE-pain continued to perform well by maintaining fidelity, encouraging participant uptake and retention, and promoting ESCAPE-pain to peers:

“...[Anna’s] been fantastic...she's seen the outcomes...she'll intervene now and say: ‘Now that doesn't quite work like that’, which is great because it means at least there’s someone else I can rely on...” (Amy)

They also collected data that allowed Champions to demonstrate ESCAPE-pain’s on-going effectiveness and value. However, as more junior clinicians they lacked influence amongst senior managers, which limited their ability to affect decisions that directly impacted on ESCAPE-pain’s sustainability:

“I've suggested things, but just get the nod ‘Okay, yeah’, then no more...” (Anna)

Senior Managers

‘Senior Managers’ (e.g. Directors of Therapy Services, Heads of Physiotherapy or MSK services) were vital to the implementation and continuation of ESCAPE-pain. Senior Managers who supported the programme used their influence to expedite decisions, facilitate its smooth running by resolving problems, releasing resources and resisting pressure to adapt or stop the programme. Their support signalled the importance and value of the programme to the service or organisation, which helped to build commitment and enthusiasm amongst staff:

“[The Director of Therapy Services] believes in it and she wants it done essentially, so that’s where it comes from” (Nora)

Conversely, a lack of managerial support from disengaged Senior Managers undermined the programme and impeded Champions' efforts to embed ESCAPE-pain into clinical practice and /or could lead to it being stopped:

“...it was quite a fight to keep it going anyway...it's not active resistance, it's just not active support to keep it going” (Amy)

Some Senior Managers expressed concerns about ESCAPE-pain related to the number of sessions (and the impact on clinical activity levels), the burden on clinical time from the requirement to collect data, or questioned the evidence underpinning ESCAPE-pain and its relevance to their organisation and patient population.

The positive and negative influence of Senior Managers on sustaining ESCAPE-pain was exemplified in service reconfigurations. In one organisation (Richlands) the Senior Managers were enthusiastic about ESCAPE-pain and facilitated its internal spread:

“It was first mentioned to myself and the outpatients manager by the Head of Therapies here, because we had merged with [Richlands] and [Richlands] were already doing ESCAPE-pain...she obviously found out about ESCAPE-pain through speaking to the manager at [Richlands]” (Adam).

In another organisation (Newstead) following the merge of two physiotherapy services, the new leadership showed limited commitment to ESCAPE-pain and stopped it. Although the programme re-started 6-months later (in part due to efforts by the Champion), Senior Managers did not support expanding provision to other sites delivering MSK services across the organisation.

Decision-making

Decision-making about sustaining ESCAPE-pain was mainly an informal and tactical process. It occurred as part of the regular one-to-one meetings or daily contact between senior clinicians and Senior Managers. Decision-making about continuing the intervention was not a discrete, time-limited event, but instead a process that built consensus overtime:

“...it wasn’t that we said we need this meeting and then decide. I suppose we have a dialogue daily about all sorts of things. So again, it was an evolution...” (Alex)

“...because of the feedback that we had got from patients we knew that it was something that we were going to continue to keep running...it then became integrated into what we deliver...there wasn't any argument about that, nobody challenged that...there was no formal meeting...” (Dee)

The Champions and Supporters provided Senior Managers with evidence not only of the programme’s effectiveness, but also weighed this against impacts on key service performance metrics (e.g. number of patient-clinician contacts, waiting list times, referral, uptake and retention rates, and patient satisfaction):

“...if you see patients over a certain number then you get a reduced rate per patient....but we didn’t necessarily think: ‘well, if we do this [continue ESCAPE-pain] then we’re certainly going to be well over our quota’...[Director of Therapies] didn’t see that as a concern because we know it’s a quality intervention...” (Alex)

Another key contributing factor in deciding to continue ESCAPE-pain was whether Senior Managers perceived it could be integrated into existing services causing little disruption. Since ESCAPE-pain was similar to other physiotherapy interventions it was familiar to Senior Managers who perceived it as integrating at an individual practice and

service-level with limited disruption. Consequently, ESCAPE-pain appeared to be easily 'normalised' and quickly perceived as a 'usual' service activity:

“There weren't that many budgetary concerns or anything...it's a group exercise programme for OA knee, which works really well...it's really nicely packaged. But it's not a long stretch from other interventions that we offer...[it] fitted into the current models of how we operate...” (Alex)

Deciding to sustain ESCAPE-pain could be contentious. In one organisation (Newstead) the Champions and Supporters saw sustaining an EBI that was demonstrating local clinical effectiveness as a straightforward and incontrovertible decision:

“...It's something that is recently evidence-based, we do know it works, we'd be silly not to be involved in it...” (Nora)

“... I saw the value in it and thought I'm going to implement it and just let the numbers speak for themselves...” (Ed)

However, Senior Managers perceived ESCAPE-pain's benefits were outweighed by its costs (e.g. burden on clinical time, adverse impact on performance metrics), concerns about the applicability of the original research, and they perceived a similar briefer intervention already delivered in their other sites to be adequate (despite it having no data to demonstrate clinical effectiveness). Eventually Senior Managers agreed to deliver ESCAPE-pain at a single site, but not to expand provision to its other two sites delivering MSK services. This created a sense of the programme surviving rather than thriving. The Champion blamed himself for not building consensus and mistakenly believing that demonstrating the programme's value could convince reluctant Senior Managers:

“I went about it the wrong way and didn't get enough of the right people on board” (Ed)

In other organisations the decision to sustain ESCAPE-pain at individual sites was taken by local service managers. Senior Managers signalled their support for ESCAPE-pain, but left it up to local managers and clinicians whether to implement and sustain ESCAPE-pain depending on local capacity and availability of resources:

“...It's not a clear strategy. It's basically down to where we think we can feasibly run it and that's down to staffing and facilities really and population...you don't necessarily want clinicians dictated to...it's not the way they like to get things done...” (Dee)

There was a perception that this local autonomy created a more favourable context for implementing and sustaining ESCAPE-pain. However, local autonomy meant that Senior Manager could not always prevent ESCAPE-pain from being adapted or discontinued:

“[a Senior Manager] was again pushing for the twice-a-week sessions and we had to say ‘look we really can't do it.’ We ended up getting our team lead on board...all four of us sat down in a room...we had to have that discussion where we said ‘we physically can't cope with this many sessions’...” (Harry)

Discussion

This study showed that leadership roles and activities by physiotherapists at different levels within the NHS were essential to implement and sustain a complex EBI for people with OA, ESCAPE-pain.

Senior specialist physiotherapists played a key role as ‘Champions’ in supporting the implementation and sustainability of ESCAPE-pain. Champions fulfilled many different functions to facilitate the knowledge, resources and relationships necessary to drive the on-going work to sustain the intervention. Whilst champions and their role as facilitators are

known to influence implementation, there is less empirical evidence focusing on the detail of their work to support implementation and sustainability [7,8,37–39]. In the case of ESCAPE-pain, facilitation by Champions continues to be an important factor in sustainability. The position of Champions within their organisations and personal attributes allowed them to build support at a strategic and operational level. Their ability to link different parts of the social network meant that they could garner the collective action required from both senior managers and operational staff for ESCAPE-pain’s continued integration. The impact of social influence is key to implementing and embedding innovations in health settings and that the position of individuals in social networks affects their ability to exert greater influence to enact change [8,10,12,37,40–42].

Champions needed to influence senior leaders to secure continued commitment to ESCAPE-pain, to resolve any critical issues, and advocate the value of ESCAPE-pain to staff, to support sustainability. Supportive, engaged senior leaders are necessary for implementing and sustaining intervention effectively [8,27,43]. Gustafson reported that if senior managers are actively and routinely engaged about an innovation there is a greater likelihood that it will be better integrated in the local contexts [44]. Ambivalence or disengagement about ESCAPE-pain by senior leaders was perceived as much a threat to sustainability as active resistance. This is echoed in work by Locoock, which found *‘you don’t have to be actively hostile to cause trouble – you can cause a lot of problems just being neutral’* [45].

At an operational level, champions enrolled support from senior clinicians (or peers) who shared a commitment to evidence-based practice to take ownership for overseeing ESCAPE-pain and from more junior colleagues to enact the practices to deliver the intervention. Champions enabled more junior colleagues to be dispersed leaders to undertake operational functions and influence peers to support ESCAPE-pain. The approach taken by Champions illustrates what is known about the importance of building connections and

relationships so that interventions are seen as the property (or responsibility) of the whole system, rather than of an individual [40,46]. The idea of Champions as heroic or lone leaders is not a sustainable approach for the individual or a viable model for sustaining an intervention, which is a collective social process [47–49]. However, the hierarchical structures in many physiotherapy services meant that the effectiveness of these ‘supporters’ as distributed leaders was limited when it came to influencing senior managers. This echoes work by Martin and colleagues that found organisational structures can constrain the effectiveness of dispersed leadership in change processes in healthcare [50].

Kanter’s structural theory of power is useful in understanding the personal and contextual mechanisms underpinning the ability of Champions to sustain ESCAPE-pain successfully [51,52]. The theory shows how systemic power factors (such as formal power via an individual’s job role and informal power from an individual’s connectedness within an organisation) influence job-related empowerment structures (e.g. access to resources, information, and support). This empowerment has personal impacts on the individual (e.g. increased self-efficacy, motivation, and perceived autonomy), which results in increased effectiveness in their work (e.g. achieving work-related goals, increased respect and cooperation within the organisation). It has shown that formal and informal power are important predictors of physiotherapists empowerment and their ability to work effectively [51]. In the case of ESCAPE-pain, Champions’ structural position and personal attributes afforded many formal (e.g. recognition of their clinical expertise and discretion in decision-making) and informal power factors (e.g. develop and utilise professional networks). This empowered them to secure the necessary resources and support to effect change to sustain ESCAPE-pain.

As ‘middle managers’ Champions galvanised collective action by different agents from across a practice setting (senior managers and operational staff) illustrates the important

interplay between the role of networks, individual professional power and intervention sustainability [16,32,53,54]. The ability (or not) to develop and utilise extensive networks of clinical and managerial support can be critical in securing the necessary commitment and resources to sustain innovations within health [54,55]. There is growing evidence to suggest that ‘middle managers’ play a pivotal role in determining implementation outcomes [10,12,56].

The collective action facilitated by Champions points to the importance of the integration of multiple layers of leadership (i.e. clinical champions, supports, and senior leaders) in creating a receptive context for implementing and sustaining an EBI [9,10,16]. For the programme to be sustained it appears necessary to have continued and aligned actions by individuals across a range of leadership roles [16].

Strengths and limitations. The study focused on a single intervention, which may mean the findings are not applicable to other interventions, health conditions or parts of the health system. The case inclusion criteria select towards a particular type of case (i.e. those with fidelity to the ESCAPE-pain programme); therefore, this influences the cross-case analysis and interpretation. The use of multiple organisational cases may help to increase the transferability of the findings to other organisations. In addition, the findings may have relevance to rehabilitation programmes similar to ESCAPE-pain (i.e. integrating group exercise and education to improve self-management in chronic conditions). The use of interviews meant the analysis was based on reported, rather than directly observed, activities. However, the use of multiple participants within each organisation increased the robustness of the within case analysis.

Conclusion

The study characterises the role of leadership in physiotherapy to sustain an evidence-based intervention for OA within the NHS. Sustaining the intervention requires on-going leadership, it did not stop at implementation. Senior specialist physiotherapists (as Champions) had a critical leadership role in driving sustainability. Their structural position (bridging the operational and strategic) and personal attributes allowed them to integrate different levels of leadership (i.e. senior managers and operational staff) to mobilise the collective, on-going work required for sustaining the programme.

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References

1. Metcalfe C, Lewin R, Wisher S, Perry S, Bannigan K, Moffett JK. Barriers to Implementing the Evidence Base in Four NHS Therapies: Dietitians, occupational therapists, physiotherapists, speech and language therapists. *Physiotherapy*. 2001 August;87:433–441.
2. Harding KE, Porter J, Horne-Thompson A, Donley E, Taylor NF. Not enough time or a low priority? Barriers to evidence-based practice for allied health clinicians. *J Contin Educ Health Prof*. 2014;34:224–231.
3. Jones CA, Roop SC, Pohar SL, Albrecht L, Scott SD. Translating Knowledge in Rehabilitation: Systematic Review. *PHYS THER*. 2015 April 1;95:663–677.
4. Bartholdy C, Nielsen SM, Warming S, Hunter DJ, Christensen R, Henriksen M. Poor replicability of recommended exercise interventions for knee osteoarthritis: a descriptive analysis of evidence informing current guidelines and recommendations. *Osteoarthr Cartil*. 2019 January;27:3–22.
5. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implementation Science*. 2009 August 7;4:50.
6. Lennox L, Maher L, Reed J. Navigating the sustainability landscape: a systematic review of sustainability approaches in healthcare. *Implementation Science*. 2018 February 9;13:27.
7. Harvey G, Loftus-Hills A, Rycroft-Malone J, Titchen A, Kitson A, McCormack B, Seers K. Getting evidence into practice: the role and function of facilitation. *J Adv Nurs*. 2002 March;37:577–588.

8. Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q.* 2004;82:581–629.
9. Aarons GA, Ehrhart MG, Farahnak LR, Sklar M. Aligning leadership across systems and organizations to develop a strategic climate for evidence-based practice implementation. *Annu Rev Public Health.* 2014;35:255–274.
10. Guerrero EG, Frimpong J, Kong Y, Fenwick K, Aarons GA. Advancing Theory on the Multilevel Role of Leadership in the Implementation of Evidence-Based Health Care Practices. *Health Care Manage Rev [Internet].* 2018 June 25 [cited 2020 February 6]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6309767/>
11. Carroll C, Patterson M, Wood S, Booth A, Rick J, Balain S. A conceptual framework for implementation fidelity. *Implement Sci.* 2007;2:40.
12. Shediak-Rizkallah MC, Bone LR. Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice and policy. *Health Educ Res.* 1998 March;13:87–108.
13. Scheirer MA, Dearing JW. An agenda for research on the sustainability of public health programs. *Am J Public Health.* 2011 November;101:2059–2067.
14. Birken SA, Lee S-YD, Weiner BJ. Uncovering middle managers' role in healthcare innovation implementation. *Implement Sci.* 2012 April 3;7:28.
15. Aarons GA, Ehrhart MG, Farahnak LR. The implementation leadership scale (ILS): development of a brief measure of unit level implementation leadership. *Implementation Science.* 2014 April 14;9:45.

16. Fleischer AR, Semenic SE, Ritchie JA, Richer M-C, Denis J-L. An organizational perspective on the long-term sustainability of a nursing best practice guidelines program: a case study. *BMC Health Serv Res*. 2015 December 3;15:535.
17. Norton WE, McCannon CJ, Schall MW, Mittman BS. A stakeholder-driven agenda for advancing the science and practice of scale-up and spread in health. *Implementation Science*. 2012;7:118.
18. Yin RK. *Case study research: design and methods*. Thousand Oaks, Calif.: Sage Publications; 2003.
19. Eisenhardt KM. Building Theories from Case Study Research. *The Academy of Management Review*. 1989;14:532–550.
20. NICE. *Osteoarthritis: Care and management in adults CG 177*. NICE; 2014. Available from: <http://www.nice.org.uk/guidance/cg177>
21. Hurley MV, Walsh NE, Mitchell HL, Pimm TJ, Patel A, Williamson E, Jones RH, Dieppe PA, Reeves BC. Clinical effectiveness of a rehabilitation program integrating exercise, self-management, and active coping strategies for chronic knee pain: a cluster randomized trial. *Arthritis Rheum*. 2007 October 15;57:1211–1219.
22. Hurley MV, Walsh NE, Mitchell H, Nicholas J, Patel A. Long-term outcomes and costs of an integrated rehabilitation program for chronic knee pain: a pragmatic, cluster randomized, controlled trial. *Arthritis Care Res (Hoboken)*. 2012 February;64:238–247.
23. Jessep SA, Walsh NE, Ratcliffe J, Hurley MV. Long-term clinical benefits and costs of an integrated rehabilitation programme compared with outpatient physiotherapy for chronic knee pain. *Physiotherapy*. 2009 June;95:94–102.

24. Goldstein RS, Hill K, Brooks D, Dolmage TE. Pulmonary Rehabilitation: A Review of the Recent Literature. *Chest*. 2012 September 1;142:738–749.
25. Dalal HM, Doherty P, Taylor RS. Cardiac rehabilitation. *BMJ* [Internet]. 2015 September 29 [cited 2020 January 28];351. Available from: <https://www.bmj.com/content/351/bmj.h5000>
26. NICE. Low back pain and sciatica in over 16s: assessment and management. 2016. Available from: <https://www.nice.org.uk/guidance/ng59>
27. Wiltsey Stirman S, Kimberly J, Cook N, Calloway A, Castro F, Charns M. The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. *Implementation Science*. 2012;7:17.
28. Scheirer MA. Is Sustainability Possible? A Review and Commentary on Empirical Studies of Program Sustainability. *American Journal of Evaluation*. 2005 September 1;26:320–347.
29. Mason M. Sample Size and Saturation in PhD Studies Using Qualitative Interviews. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* [Internet]. 2010 August 24 [cited 2015 April 15];11. Available from: <http://www.qualitative-research.net/index.php/fqs/article/view/1428>
30. Baker SE, Edwards R. How many qualitative interviews is enough? 2012 [cited 2016 February 28]. Available from: http://eprints.ncrm.ac.uk/2273/4/how_many_interviews.pdf
31. Kalkan A, Roback K, Hallert E, Carlsson P. Factors influencing rheumatologists' prescription of biological treatment in rheumatoid arthritis: an interview study. *Implementation Science*. 2014 October 11;9:153.
32. Ploeg J, Markle-Reid M, Davies B, Higuchi K, Gifford W, Bajnok I, McConnell H, Plenderleith J, Foster S, Bookey-Bassett S. Spreading and sustaining best practices for home

care of older adults: a grounded theory study. *Implement Sci* [Internet]. 2014 November 7 [cited 2015 March 11];9. Available from:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4225037/>

33. Drew S, Judge A, May C, Farmer A, Cooper C, Javaid MK, Goberman-Hill R, \$author.lastName \$author firstName. Implementation of secondary fracture prevention services after hip fracture: a qualitative study using extended Normalization Process Theory. *Implementation Science*. 2015 April 23;10:57.
34. Lewis J. Analysing Qualitative Longitudinal Research in Evaluations. *Social Policy and Society*. 2007 October;6:545–556.
35. Thomson R. The Qualitative Longitudinal Case History: Practical, Methodological and Ethical Reflections. *Social Policy and Society*. 2007 October;6:571–582.
36. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3:77–101.
37. Long JC, Cunningham FC, Braithwaite J. Bridges, brokers and boundary spanners in collaborative networks: a systematic review. *BMC Health Services Research*. 2013 April 30;13:158.
38. Waterman H, Boaden R, Burey L, Howells B, Harvey G, Humphreys J, Rothwell K, Spence M. Facilitating large-scale implementation of evidence based health care: insider accounts from a co-operative inquiry. *BMC Health Serv Res*. 2015 February 13;15:60.
39. Kristensen HK, Hounsgaard L. Implementation of coherent, evidence-based pathways in Danish rehabilitation practice. *Disability and Rehabilitation*. 2013 November 1;35:2021–2028.

40. Avolio BJ, Walumbwa FO, Weber TJ. Leadership: current theories, research, and future directions. *Annu Rev Psychol.* 2009;60:421–449.
41. May CR, Mair F, Finch T, MacFarlane A, Dowrick C, Treweek S, Rapley T, Ballini L, Ong BN, Rogers A, et al. Development of a theory of implementation and integration: Normalization Process Theory. *Implement Sci.* 2009 May 21;4:29.
42. Borgatti SP, Halgin DS. On Network Theory. *Organization Science.* 2011 April 11;22:1168–1181.
43. Proctor E, Luke D, Calhoun A, McMillen C, Brownson R, McCrary S, Padek M. Sustainability of evidence-based healthcare: research agenda, methodological advances, and infrastructure support. *Implement Sci [Internet].* 2015 June 11 [cited 2017 September 14];10. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4494699/>
44. Gustafson DH, Sainfort F, Eichler M, Adams L, Bisognano M, Steudel H. Developing and testing a model to predict outcomes of organizational change. *Health Serv Res.* 2003 April;38:751–776.
45. Locock L, Dopson S, Chambers D, Gabbay J. Understanding the role of opinion leaders in improving clinical effectiveness. *Soc Sci Med.* 2001 September;53:745–757.
46. Walumbe J, Swinglehurst D, Shaw S. Any qualified provider: a qualitative case study of one community NHS Trust's response. *BMJ Open.* 2016 February 1;6:e009789.
47. Pearce CL. The future of leadership: Combining vertical and shared leadership to transform knowledge work. *ACAD MANAGE PERSPECT.* 2004 February 1;18:47–57.
48. May C. Towards a general theory of implementation. *Implementation Science.* 2013;8:18.

49. Albury D, Beresford T, Dew S, Horton T, Illingworth J, Langford K. Against the odds: Successfully scaling innovation in the NHS. The Health Foundation; 2018. Available from: <http://www.health.org.uk/publication/against-odds-successfully-scaling-innovation-nhs>
50. Martin GP, Currie G, Finn R. Leadership, Service Reform, and Public-Service Networks: The Case of Cancer-Genetics Pilots in the English NHS. *J Public Adm Res Theory*. 2009 October 1;19:769–794.
51. Miller PA, Goddard P, Spence Laschinger HK. Evaluating Physical Therapists' Perception of Empowerment Using Kanter's Theory of Structural Power in Organizations. *Phys Ther*. 2001 December 1;81:1880–1888.
52. Kanter RM. *Men and women of the corporation*. New York, NY: Basic Books; 2010.
53. Nilsen P, Timpka T, Nordenfelt L, Lindqvist K. Towards improved understanding of injury prevention program sustainability. *Safety Science*. 2005 December;43:815–833.
54. Martin GP, Weaver S, Currie G, Finn R, McDonald R. Innovation sustainability in challenging health-care contexts: embedding clinically led change in routine practice. *Health Serv Manage Res*. 2012 November;25:190–199.
55. Birken SA, Lee S-YD, Weiner BJ, Chin MH, Chiu M, Schaefer CT. From strategy to action: how top managers' support increases middle managers' commitment to innovation implementation in health care organizations. *Health Care Manage Rev*. 2015 June;40:159–168.
56. Birken SA, DiMartino LD, Kirk MA, Lee S-YD, McClelland M, Albert NM. Elaborating on theory with middle managers' experience implementing healthcare innovations in practice. *Implementation Science*. 2016;11:2.

Table 1 Description of study sites and participants

Organisation	Number and description of sites Participants – pseudonym*, gender, and job role
Newstead	1 site – A large NHS acute and community trust. ESCAPE-pain delivered in a community health centre. <ul style="list-style-type: none">• Ed, Male, Consultant MSK Physiotherapist• Jasmine, Female, Team Lead and Specialist MSK Physiotherapist• Nadia, Female, Head of Physiotherapy• Anita, Female, Consultant MSK Physiotherapist• Mia, Female, Director of Therapy Services• Nora, Female, Deputy Clinical Lead and Specialist MSK Physiotherapist
Riverhills	6 sites – A large NHS community trust operating from multiple sites (including district and community hospitals, health centres and GP practices). <ul style="list-style-type: none">• Joan, Female, Specialist MSK Physiotherapist• Harry, Male, Specialist MSK Physiotherapist• Irene, Female, Specialist MSK Physiotherapist• Bilal, Male, Specialist MSK Physiotherapist• Diana, Female, Specialist MSK Physiotherapist• Dee, Female, Clinical lead for MSK and Specialist MSK Physiotherapist• Rose, Female, Specialist MSK Physiotherapist
Burbank	4 sites – A large NHS acute trust. ESCAPE-pain delivered in MSK outpatients of large acute hospital site and a community hospital, and in two community leisure centres. <ul style="list-style-type: none">• Anna, Female, Specialist MSK Physiotherapist• Maya, Female, Specialist MSK Physiotherapist• Dennis, Male, Extended Scope Physiotherapist and Clinical Lead• Amy, Female, Consultant MSK Physiotherapist• Kay, Female, Head of Therapy Services
Richlands	2 sites – A large NHS acute trust with two large acute hospital sites. <ul style="list-style-type: none">• Alex, Male, Head of MSK Services and Extended Scope Physiotherapist• Sue, Female, Specialist MSK Physiotherapist• Karen, Female, Head of Therapy Services• Damian, Male, Specialist MSK Physiotherapist• Adam, Male, Extended Scope Physiotherapist and Clinical Lead

*Pseudonyms are used for all organisations and participants

Table 2 Summary of interview schedule topics

Implementing ESCAPE-pain:

- Extent of involvement in implementation
- Funding/resources for implementation
- Implementation process (who, how, what, when?)
- Barriers and enablers to implementation i.e. practitioner/service/organisation/system level
- Roles and responsibilities in implementation
- Decision-making about implementation
- Programme fidelity and adaptation

Sustaining ESCAPE-pain:

- Monitoring and evaluation of the programme
- Funding/resources for sustainability
- Decision-making about sustaining the programme
- Roles and responsibilities in on-going delivery
- Barriers and enablers to sustainability i.e. practitioner/service/organisation/system level
- Changes to the allocation of resources (e.g. staffing, space, equipment, time)
- Programme fidelity and adaptation

Table 3 Leadership roles and actions to sustain ESCAPE-pain

Leadership role	Examples of leadership actions supporting the sustainability of ESCAPE-pain
Clinical champions	<ul style="list-style-type: none"> • Engendering a sense of enthusiasm about ESCAPE-pain • Providing operational oversight for day-to-day delivery of ESCAPE-pain • Sharing knowledge about ESCAPE-pain (e.g. evidence-based, performance, characteristics) • A resource or ‘go-to’ person to resolve issues relating to ESCAPE-pain • Role model to frontline clinical staff (e.g. demonstrating clinical expertise, credibility) • Facilitating relationships and integrating leadership roles (i.e. connecting strategic and operational activities) • Promoting and demonstrating the value of ESCAPE-pain to senior managers • Quality assuring fidelity to core components • Guiding the adaptation / enhanced performance of ESCAPE-pain
Supporters	<ul style="list-style-type: none"> • Influencing front line peers to engender grass roots buy-in and ownership of ESCAPE-pain • Supporting knowledge sharing about ESCAPE-pain amongst peers • Assisting with the identification of poor operational integration and potential solutions • Monitoring the performance of ESCAPE-pain • Monitoring (unsanctioned) adaptations to ESCAPE-pain
Senior Managers	<ul style="list-style-type: none"> • Communicating a unified message to staff about value of and commitment to ESCAPE-pain • Reviewing the performance of ESCAPE-pain within the context of the wider service (e.g. service key performance indicators, resource availability) • Releasing / re-structuring resources to support deliver and integration of ESCAPE-pain • Brokering relationships and expediting decisions at senior levels to ensure operational delivery • Shielding ESCAPE-pain from wider service/organisational/system pressures