Providing patients with direct access to musculoskeletal physiotherapy: the impact on general practice musculoskeletal workload and resource use. The STEMS-2 study

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Abstract

Objectives This study examined the real-world impact of patient direct access to NHS physiotherapy (self-referral) on (a) general practice consultations for musculoskeletal (MSK) conditions and (b) specified clinical management for patients with MSK conditions.

Design and setting Natural experiment in four general practices and the associated physiotherapy service.

Methods Anonymised routinely collected data were obtained. MSK coded GP consultations, recorded fit notes, MSK-related prescription medication, X-rays and MRI requests, and referrals to secondary care for patients consulting with MSK conditions were identified and trends described across a 6-year period (June 2011 to June 2017). Joinpoint regression analysis was used to identify any significant changes in GP MSK consultation trends before and after the introduction of self-referral to physiotherapy. Physiotherapy service data examined access methods used by patients (GP referred, GP recommended self-referral, true self-referral) and the number of physiotherapy sessions.

Results Direct access resulted in inconsistent impact on general practices. In one arm of the experiment a significant increase in GP consultations was observed and in one arm was stable. Exploratory examination of clinical management showed only requests for X-rays (arm 1) and possibly requests for MRI (arm 2) changed over time. Physiotherapy service referrals showed a low uptake of true self-referral (10% and 6%) in each arm respectively.

Conclusion This is the first study to examine the real-world impact of patient direct access to physiotherapy at general practice level. We found no consistent impact of patient direct access on GP MSK workload. Impact on some clinical management was observed but not consistently in the direction suggested by previous studies.

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Keywords: Physiotherapy; Patient direct access; Self-referral; Musculoskeletal; GP workload; Routinely collected data

Introduction

In the drive to reduce burden on general practices, patient direct access (self-referral) to NHS physiotherapy has been suggested as a way of reducing musculoskeletal (MSK) consultations with GPs. Previous data has suggested patient direct access reduces GP workload by 20% by decreasing repeat consultations [1]. We define patient direct access to MSK physiotherapy as where "patients are able to refer themselves to a physiotherapist without having to see a GP first,

or without being told to refer themselves by a health professional" [2].

This study investigated self-referral to an existing NHS MSK physiotherapy service not a general practice-based first contact practitioner (FCP) service. Self-referral has been established in many areas of the UK for many years but has never been routinely available. Self-referral to existing MSK physiotherapy services is one way of increasing access to physiotherapy for patients and meeting the growing demand for MSK care. Self-referral to physiotherapy will continue alongside recent developments such as general practice-based FCPs to enhance access to physiotherapy. Self-referral services also mirror the process through which patients might access FCP services in what is known as 'hub' models, where FCPs are not based within general practices but in physiotherapy services, and so information from self-referral services can inform the design of such models.

We previously conducted a pilot cluster randomized controlled trial (STEMS) in four general practices and associated physiotherapy service in North West England. Two practices were randomized to continue with usual GP-led care (control) and two had the addition of a patient direct access to NHS physiotherapy pathway for adults with MSK conditions (intervention). As a result patients in the intervention practices could access physiotherapy through three possible routes (a) 'GP referred' where the GP or nurse practitioner sends a traditional written referral, (b) 'true self-referral' where the patient refers themselves to the service without contact with their general practice and (c) 'GP/nurse recommended self-referral' where a GP or nurse practitioner instructs the individual to self-refer. As a pilot RCT the aim of the STEMS was to investigate the feasibility of a future main RCT, and we demonstrated that this would be feasible. It included a number of feasibility outcomes but did not include between group testing on patient outcomes given it was a feasibility and pilot RCT. The pilot RCT protocol and results have been published [3,4]. The patient direct access pathway was introduced to the intervention practices in April 2013. The physiotherapy service continued direct access after the RCT and subsequently implemented it in the two control practices in December 2015. This provided a natural experiment to address key knowledge gaps regarding patient direct access to physiotherapy. There were three components to this new study (STEMS-2), with the following aims.

Component 1: To analyze change in general practice MSK consultations and specified clinical management over time following introduction of the direct access pathway.

Component 2: To further assess the cost-effectiveness of direct access.

Component 3: To explore the perceived impact of direct access for patients, GPs, physiotherapists and commissioners.

In this paper we report Component 1 with a primary aim to investigate change in general practice MSK consultations as a result of patient direct access to physiotherapy. A secondary aim was to explore the wider impact of patient direct access to physiotherapy by assessing whether certain clinical management was affected by patient direct access to physiotherapy. The clinical management investigated was provision of prescription medication, fit notes (sickness certification), X-rays/scans and onward referral, which have been suggested, in previous observational studies and the pilot RCT may reduce after introduction of patient direct access [1,2,4]. Components 2 and 3 are reported separately [Yang *et al.*, health economics companion paper], Igwesi-Chidobe *et al.*, qualitative companion paper].

Methods

This study was a natural experiment in the four general practices and the associated physiotherapy service that took part in the STEMS pilot RCT. The general practices involved in this study all used the same electronic primary care clinical system, EMIS Web. Clinical records in EMIS Web contain Read codes, which are the most commonly used of clinical coding structures in UK primary care [5] and were used to identify patients with MSK conditions.

We obtained anonymised patient electronic health record data via the dedicated EMIS Health Data Extraction Service. All patient identifiers are removed by EMIS during the extraction procedure, with each patient given a unique ID. The data period of interest for this study was June 2011 (2 years prior to the start of the STEMS RCT in June 2013) to June 2017 (18 months after the physiotherapy service introduced direct access into the control general practices in December 2015). An overview of the timeline is shown in Fig. 1.

Anonymised data on MSK coded consultations, the number of recorded fit notes, X-rays and MRI scans, MSK-related prescription medications, and referrals to secondary care for patients who consulted with MSK conditions were identified. Consultations for a MSK condition were identified by use of a Read code list developed previously and used in previous studies [3,4,6,7]. The Read code list is available at www.keele.ac.uk/mrr. We adopted a pragmatic approach which counted all MSK relevant requests for X-rays, MRI scans and onward referrals, which occurred within 2 weeks following a consultation for a coded MSK condition. Requests clearly for a different body region than the MSK consultation were not counted. We also identified prescription medications most commonly used for MSK conditions as used in previous studies [4,7]. These medications included simple analgesics, NSAIDs and opioids.

Data analysis

Trends in overall consultations for MSK conditions, number of fit notes, prescribed medications, X-rays and MRI scans and referrals to secondary care requested for patients with MSK pain were described across the 6-year period (June 2011 to June 2017). The impact of introducing patient direct access to physiotherapy was examined in the previous RCT
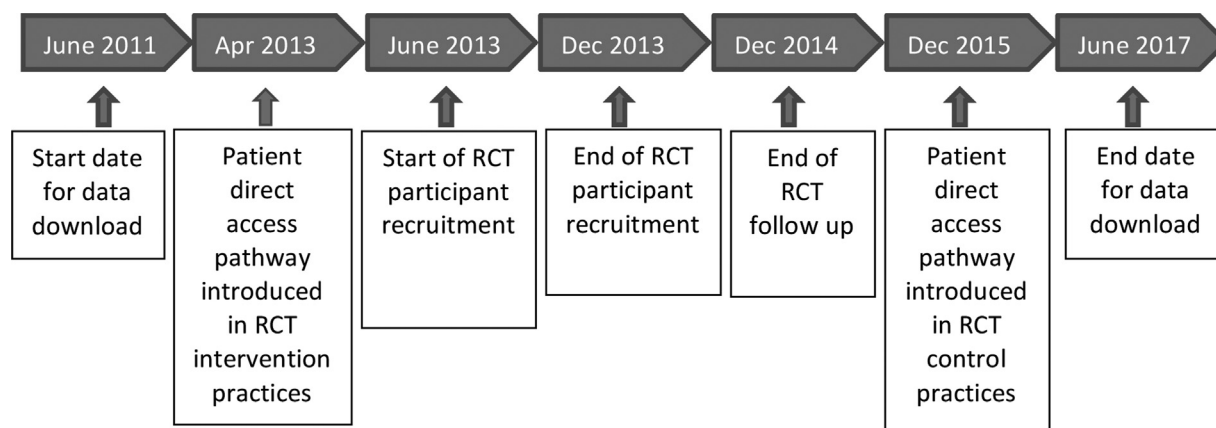
Fig. 1. Overview of the data timeline.

intervention practices (Practices A and B), as of June 2013 and in control practices (Practices C and D) as of December 2015.

Quarterly prevalence of MSK consultations

The observational period was divided into quarterly periods. The quarters were defined on a seasonal basis from the third quarter of 2011 (July, August and September) to the second quarter of 2017 (April, May and June).

The numerators for calculating quarterly prevalence of MSK consultation were the number of identified MSK consultations within each quarterly period. The denominator was the person-time of registered population in each period. Quarterly prevalence of MSK consultation (number per 100 registered population) was calculated and trends described for the general practices in the intervention and control arms (and in individual practices) from the third quarter 2011 to the second quarter 2017.

Subsequently joinpoint regression was used to assess any significant changes in quarterly general practice MSK consultation trends [8]. Joinpoint analysis allowed identification of significant changes in consultation rates. The time point for the start of each identified change (the joinpoint) was then compared with the dates when direct access to physiotherapy was introduced in each practice. If no joinpoint was identified, this would indicate no significant change in the underlying trend in consultation prevalence for MSK pain during the observational period. Permutation tests using Monte Carlo methods were used to determine the minimum number of joinpoints required to provide an adequate fit to the data [9]. Joinpoint analyses were carried out using the Joinpoint Regression Program (version 4.6, Statistical Research and Applications Branch, National Cancer Institute, 2018).

General practice clinical management related to MSK consultation

For the secondary aim, the quarterly prevalence (number per 100 registered population) for X-rays and MRI scans

ordered, referrals into secondary care, fit notes issued for patients with MSK conditions and prescription medications linked to MSK conditions were calculated over time. The numerators for calculating quarterly prevalence of each management action were the number of each action identified within the quarter. The denominator was the person-time of registered population in each quarter. Quarterly prevalence of each specified clinical management was calculated for intervention (A and B) and control (C and D) practices. No inferential analysis (joinpoint regression) was performed on the clinical management due to limited sample size.

Physiotherapy service data

Changes in the use of direct access pathways may change over time as patients become more familiar with direct access to physiotherapy. The method of referral during the STEMS pilot RCT has been reported [4], so to explore changes in trends of access over time, anonymised data on method of referral (GP referred, recommended self-referral and true self-referral) were extracted from the physiotherapy service from the start of 2015 to the end of 2017, which includes the time when direct access was introduced in control practices. Physiotherapy service data were presented using descriptive summaries, including the frequency over time of access methods (GP referred, GP recommended self-referral, true self-referral) used by patients in the four practices and the mean number of physiotherapy sessions per practice.

Results

Patient characteristics

The characteristics of the patients who consulted for a MSK condition during the data period of interest, July 2011 to June 2017, in the participating practices are summarized in Table 1.

Table 1
Characteristics of patients consulting with MSK conditions.

Characteristics	Intervention practices (A and B)	Control practices (C and D)	Total
Number of patients	6888	8652	15 540
Male, n (%)	3126 (45.4)	4000 (46.2)	7126 (45.9)
Age at 2011, mean (SD)	41.1 (19.4)	43.6 (20.2)	42.5 (19.9)
IMD score (quintile group)[a]			
1 (least deprived)	333 (4.9)	599 (7.0)	932 (6.1)
2	1356 (19.9)	1395 (16.2)	2751 (17.9)
3	1290 (18.9)	1508 (17.6)	2798 (18.2)
4	2369 (34.7)	2802 (32.6)	5171 (33.6)
5 (most deprived)	1478 (21.7)	2285 (26.6)	3763 (24.4)

SD, standard deviation; IMD, Index of Multiple Deprivation.
   [a] Scores available on 15 415 patients.

Quarterly prevalence of MSK consultations

The registered population, the number of MSK consultations and quarterly prevalence of MSK consultations in each general practice in each quarterly period are shown in Supplementary Tables A to C. The lowest prevalence of MSK consultations was seen in practice B, whereas the highest was in practice A (averaged prevalence, 12.1 per 100 registered population in practice A, 8.0 in B, 10.5 in C, 11.0 in D).

Prevalence of MSK consultations in the two general practices in the control arm (C and D) was relatively stable (around 11 per 100 registered population) and showed no joinpoints, whereas two significant changes in prevalence were found in intervention practices (A and B). The introduction of patient direct access (second quarter of 2013) was associated with the start of an increasing trend of MSK consultation (from 7.6 per 100 registered population at 2013 quarter 1 to 11.9% at 2013 quarter 4), the prevalence then became stable until the end of observation (Fig. 2).

To further explore these findings supplementary Fig. 1 shows the data by individual practice. This shows that Practice A mainly drove the change in trend of MSK consultation (increased from 10 to 15 consultations per 100 registered population) but there were increases in both practices. The pattern in the control practices C and D also differed with practice C showing a reduction in MSK consultations following the introduction of direct access (Q4 2015).

Other clinical management related to MSK conditions

The prevalence of each clinical management is shown in Fig. 3a–e. As the denominator for these estimates was the registered practice population the numbers are small for all the actions apart from prescription medications. Patterns of quarterly prevalence of X-ray requests were similar between intervention and control practices before the introduction of direct access (second quarter of 2013). After that, the prevalence of X-ray ordering was consistently lower in the intervention practices than control practices (Fig. 3a). Prevalence of MRI requests was similar between arms throughout the period of investigation, although the

prevalence in intervention practices was higher than control following introduction of direct access into control practices in the fourth quarter of 2015 (Fig. 3b). The prevalence of fit notes was initially slightly lower in intervention practices, whereas it became slightly higher after the introduction of direct access, compared to control practices (Fig. 3c). The prevalence of onward referrals was similar in intervention and control practices at the time of introduction of direct access into the intervention practices but was then slightly lower than for the control practices (Fig. 3d). Prevalence of MSK prescription medications was also initially lower in the intervention practices and it increased to a similar level to control practices after the introduction of direct access (Fig. 3e).

Physiotherapy service data

The physiotherapy service data are summarized in Table 2. Referrals by type show the large majority (78%) of patients from intervention practices accessed physiotherapy via GP/nurse recommended referral. Once direct access was introduced into the control practices, the number of GP/nurse recommended referrals gradually increased over a 6-month period to reach a similar proportion to the intervention practices, with a large reduction in traditional referrals over the same time period. The mean number of physiotherapy sessions in all practices was similar (∼3 sessions per patient). There was a consistent proportion of 'true self-referrals' across the observed time period, from 6% to 15% (mean 10%) of total referrals in intervention practices and 3% to 11% (mean 6%) in control practices once direct access was available.

Discussion

STEMS-2 was a natural experiment in four general practices and the associated NHS physiotherapy service that had participated in the STEMS pilot RCT. STEMS-2 assessed the impact of patient direct access on consultations for MSK conditions over time and examined trends of MSK consultation both before and beyond that reported in the STEMS RCT. We also explored the impact of direct access on clinician's

Table 2

Summary of physiotherapy service data between the intervention and control practices.

Quarter	Intervention general practices (A and B)					Control general practices (C and D)				
	GP/nurse referral *n (%)*	GP/nurse recommended referral *n (%)*	True self-referral *n (%)*	Total number of referrals	Average number of sessions per patient	GP/nurse referral *n (%)*	GP/nurse recommended referral *n (%)*	True self-referral *n (%)*	Total number of referrals	Average number of sessions per patient
1q.2015	7 (5.1)	117 (84.8)	14 (10.1)	138	3.0	133 (100)	0 (0)	0 (0)	133	3.4
2q.2015	7 (4.4)	142 (89.9)	9 (5.7)	158	3.1	157 (100)	0 (0)	0 (0)	157	3.4
3q.2015	11 (9.5)	94 (81.0)	11 (9.5)	116	3.1	120 (100)	0 (0)	0 (0)	120	3.2
4q.2015	*13 (11.1)*	*93 (79.5)*	*11 (9.4)*	*117*	*3.0*	*103 (100)*	*0 (0)*	*0 (0)*	*103*	*3.1*
1q.2016	19 (20.4)	66 (71.0)	8 (8.6)	93	3.0	107 (87.7)	11 (9.0)	4 (3.3)	122	3.0
2q.2016	26 (16.8)	117 (75.5)	12 (7.7)	155	3.3	90 (62.1)	51 (35.2)	4 (2.8)	145	3.0
3q.2016	21 (17.2)	92 (75.4)	9 (7.4)	122	2.5	43 (36.1)	72 (60.5)	4 (3.4)	119	2.6
4q.2016	14 (15.1)	72 (77.4)	7 (7.5)	93	2.3	33 (29.7)	74 (66.7)	4 (3.6)	111	2.3
1q.2017	10 (10.0)	74 (74.0)	16 (16.0)	100	2.4	45 (23.9)	123 (65.4)	20 (10.6)	188	2.5
2q.2017	15 (19.0)	52 (65.8)	12 (15.2)	79	2.8	10 (8.1)	100 (80.6)	14 (11.3)	124	2.8
3q.2017	9 (10.8)	64 (77.1)	10 (12.0)	83	2.9	13 (10.9)	100 (84.0)	6 (5.0)	119	2.8
4q.2017	6 (11.5)	39 (75.0)	7 (13.5)	52	3.3	4 (4.7)	76 (88.4)	6 (7.0)	86	3.0

Italicized area is 4q.2015, when direct access to physiotherapy was introduced to the control practices; % of total referral.
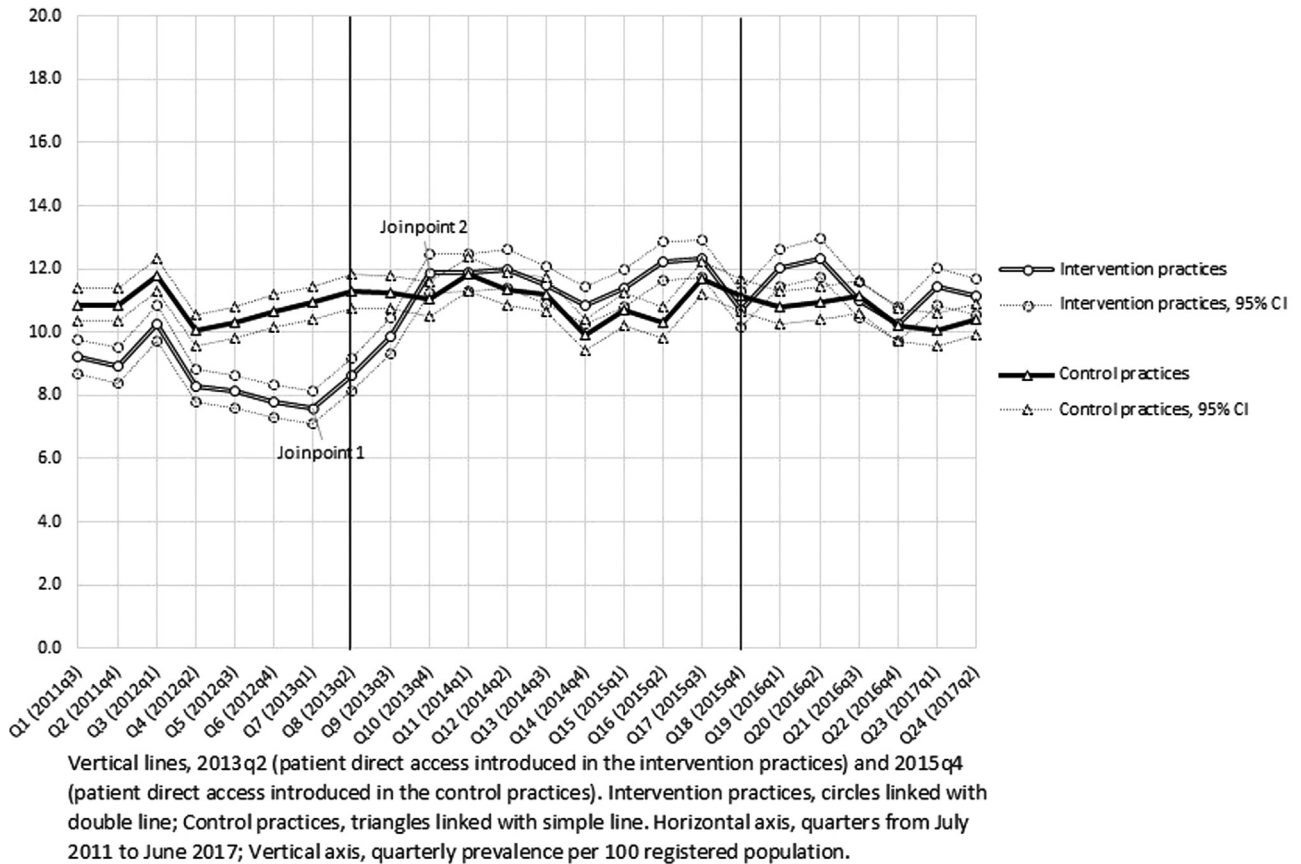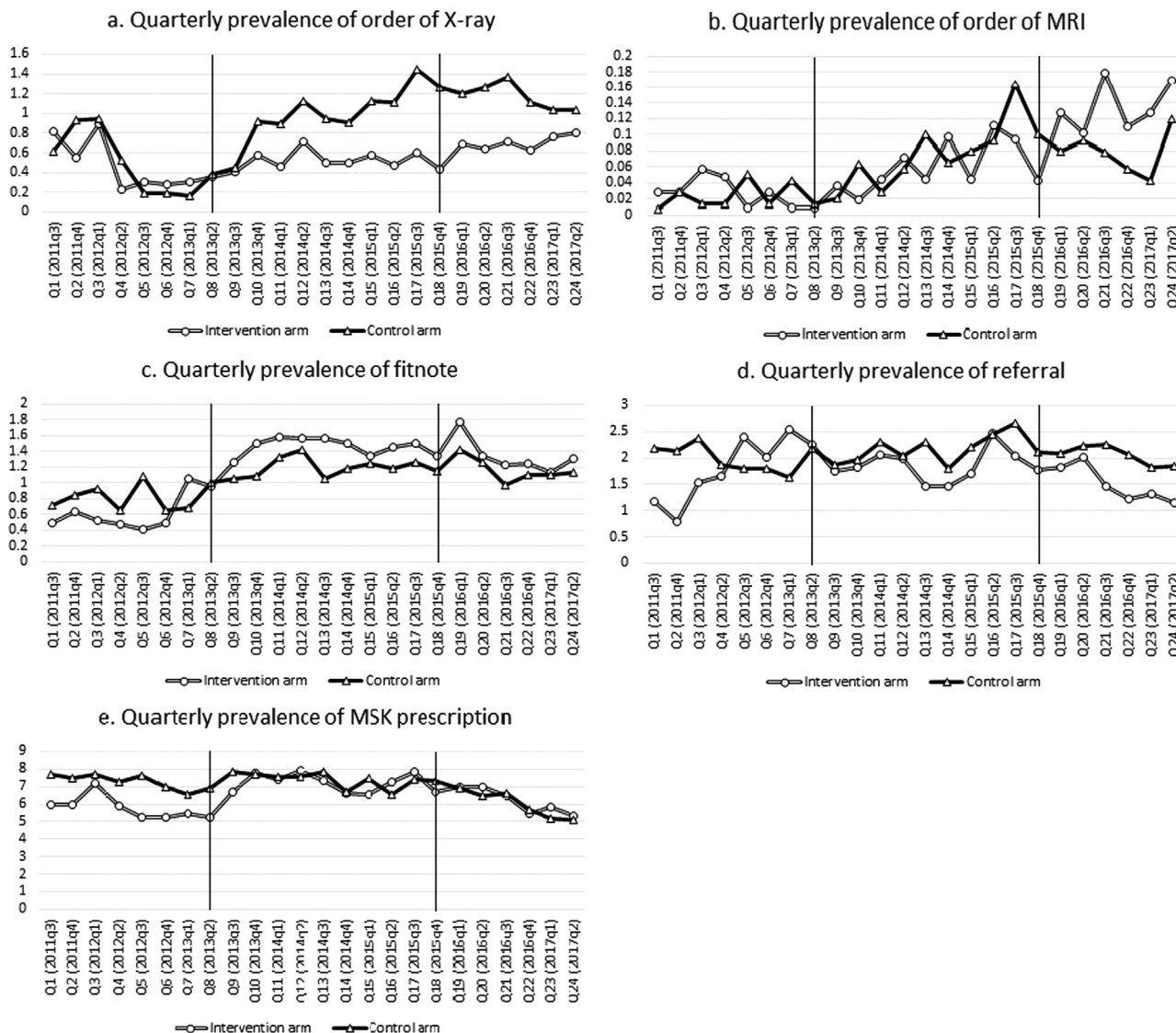
Vertical lines, 2013q2 (patient direct access introduced in the intervention practices) and 2015q4 (patient direct access introduced in the control practices). Intervention practices, circles linked with double line; Control practices, triangles linked with simple line. Horizontal axis, quarters from July 2011 to June 2017; Vertical axis, quarterly prevalence per 100 registered population.

Fig. 2. Joinpoint regression analysis of quarterly prevalence of MSK consultations in intervention and control practices from July 2011 to June 2017.

ordering of X-rays and MRIs, issuing of fit notes, onward referral rates and provision of prescription medications for MSK conditions.

This is the first study to examine the impact of introducing patient direct access to physiotherapy on general practice MSK workload at a practice level by using routinely collected data identifying all coded consultations. The results show that direct access did not have a consistent impact on MSK consultations. Introduction of patient direct access in the STEMS RCT intervention practices resulted in a significant increase in MSK consultations. When patient direct access to physiotherapy was subsequently introduced into the control practices, no overall change in MSK consultations was observed although a significant reduction was seen in one of the two practices around the time of introduction. Previous work suggests that patient direct access reduces GP workload by reducing repeat consultations [1,2] and the reasons for the increase in MSK consultation in this study are not clear. The linked interview study [Igwesi-Chidobe et al., qualitative companion paper] found some participants thought that a diagnosis can only be provided by a doctor. This suggests a persistence of a biomedical model for many patients as has been highlighted for people with back pain [10]. In preparation for the STEMS RCT all adults registered at the intervention practices were mailed information about direct access ($n = 8222$), so one possible explanation for the increase

in MSK consultations is that having received the information some patients who wished to self-refer consulted their GP to receive/confirm a diagnosis.

Examining the impact of patient direct access on the clinical management was exploratory and all the actions examined occurred in small numbers apart from provision of prescription medication. From these data, only requests for X-rays in the STEMS intervention practices and possibly requests for MRI in STEMS control practices were impacted by direct access. No clear impact on other clinical management was apparent. This is in contrast to the STEMS RCT exploratory cost analysis where fewer MRIs and X-rays were reported in the intervention arm. However being a pilot RCT there is considerable uncertainty in the reported estimates [4]. Previous studies [1,2,11–13] have also described reduced episode of care costs of patients using direct access compared to GP-referral. The reduced costs are attributed to the use of fewer scans and prescription costs and also to differences in attendances with health care professionals. However, these studies tend to examine those accessing self-referral with those who do not and it is recognized that there are important differences in the characteristics of self-referrers compared to GP-referred patients that can affect health care utilization, such as being younger, having an acute condition, being less likely to be absent from work and having a recurrence of a previous condition [12,14,15].

Vertical lines, 2013q2 (patient direct access introduced in the intervention practices) and 2015q4 (patient direct access introduced in the control practices). Intervention practices, circles linked with double line; Control practices, triangles linked with simple line. Horizontal axis, quarters from July 2011 to June 2017; Vertical axis, quarterly prevalence per 100 registered population.

Fig. 3. (a–e) GP management actions related to MSK consultations in intervention and control practices (prevalence per 100 GP practice registered population) from July 2011 to June 2017.

Since the end of the STEMS pilot RCT in 2013 there was a clear return to the usual culture of patients initially seeking care from their general practice. The physiotherapy service data show a lack of uptake by patients of 'true self-referral'; in this study this comprised only 10% in intervention practices and 6% in control practices of the physiotherapy caseload. The small proportion of 'true self-referrals' is in contrast to the STEMS pilot RCT where 26% of the physiotherapy caseload came via 'true self-referral'. This was no doubt boosted by the pretrial marketing of the new direct access service, whereas following the RCT there was no standardized approach to messaging patients about the direct access service. Introduction of direct access into the control practices had no standardized nor formal communication strategy to

patients about direct access, and this no doubt contributes to the lower proportion of 'true self-referrals' from these practices. However, a high proportion of referrals to the physiotherapy service from all practices were 'GP/nurse recommended' which indicates a shift away from traditional referrals.

In the linked interview study [Igwesi-Chidobe *et al.*, qualitative companion paper] a clear lack of awareness and understanding of the patient direct access to physiotherapy pathway was identified. This highlights the need for on-going and consistent promotion of direct access to patients and the public to avoid a return to the usual practice of patients initially seeking care from their GP. Achieving lasting cultural change in health systems requires complex and often mul-

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tifaceted approaches [16,17]. This also partly explains why evaluations of patient direct access/self-referral services have generally not seen large increases in overall demand for physiotherapy services when patient direct access is introduced [1,2]. In the Netherlands where patient direct access to physiotherapy was introduced across the whole health care system in 2006, 28% of patients used direct access to physiotherapy after 12 months [15] rising to 46% after 5 years [18], suggesting a gradual rise in self-referral where implementation is successful. Yang *et al.*, [health economics companion paper] suggest that if there is a large shift from traditional GP-led care to patient direct access to physiotherapy, demand for physiotherapy will increase which would require appropriate investment in physiotherapy services. The results of this study suggest that will not be the case unless direct access is more successfully marketed to patients, implemented and sustained.

This study identifies a number of issues around access models to MSK healthcare. These are relevant both to self-referral to existing MSK services but also for new services which may be developed and implemented. Although general practice based FCPs may help to overcome some of the problems of awareness amongst patients and may be more likely to be seen as a valid alternative to the GP since they are based in the same building, some FCP services are also established in 'hubs' serving a number of general practices. This may be due to logistics of staffing, providing training in first contact roles for less experienced staff or simply due to lack of suitable space in general practices. Raising awareness to both patients and professionals of new models of care is essential for success and this needs to be consistent and needs to continue until lasting change is achieved.

Strengths and limitations – Strengths of this study is that STEMS-2 was a natural experiment that provided a real-world setting to investigate the impact of patient direct access to physiotherapy for MSK conditions. It used routinely collected data to robustly quantify the impact on general practice MSK consultations and clinical management for patients with MSK conditions. A limitation is that only four practices were included in the natural experiment as these practices had previously participated in the STEMS pilot RCT. The inconsistent findings seen across the practices suggest other factors in addition to the introduction of patient direct access impact on MSK consultations. In this type of study there are challenges in capturing all MSK consultations as it is well recognized that Read codes are not recorded for 100% of presenting conditions [19]. Although coding of consultations and clinical management varies across practitioners our analyses were essentially within practice and so the coding habits of the GPs in the participating practices were not expected to systematically vary across the course of this study. However, some variation would be expected within-practice due to change in personnel though these natural changes could equally occur across both intervention and control practices. In addition, some referrals, investigations and prescription medication could have been for non-MSK reasons but these could not be identified due to the anonymised nature of the data.

Conclusion

In this natural experiment with four general practices and associated physiotherapy service, we found no consistent impact of patient direct access to NHS physiotherapy for MSK conditions on the musculoskeletal workload of the practices. Overall, changes in some clinical management were observed but not consistently in the direction suggested by previous studies. It is essential that patient direct access is successfully communicated to patients in ways that ensure that new services are sustained over time, so that impacts can be assessed. The inconsistent findings in the four general practices in this study, support the need for a larger study with many more general practices and physiotherapy services. A future large cluster RCT to provide practice level robust evidence of the effectiveness and cost-effectiveness of self-referral to physiotherapy is warranted.

Contribution of the paper

This paper adds to the current literature by:

- Providing data on the real-world impact of patient direct access to NHS physiotherapy at general practice level using routinely collected data.
- Contributing to the evidence base for models of care for patients with musculoskeletal conditions.
- Highlighting some of the challenges for sustained implementation of patient direct access (self-referral) to physiotherapy.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.physio.2020.04.006.

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