



Reorganizing outpatient spine services increased efficiency and patient satisfaction

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ABSTRACT

Introduction: The workload in orthopedic outpatient departments is increasing while the available medical resources are often limited.

Research questions: Can reorganizing the outpatient work routines for referred patients with spinal disorders improve cost-effectiveness and patient's experience of care (PEC) without negatively affecting the waiting time required for the healthcare guarantee?

Material and methods: We compared our standard routine (control group) to a new routine (study group) for evaluating referrals of patients with spinal complaints. In the control group, the referral was first evaluated by a spinal surgeon, and when deemed indicated, a visit to a spinal surgeon was booked. In the study group, a spinal surgeon first evaluated all referral notes and either assigned a spinal surgeon or a physiotherapist to meet the patient, depending on certain criteria. If considered eligible for surgical intervention, the patient is appointed for a follow-up visit to the spinal surgeon. For both groups, calculations were made for the number of waiting days and visits, as well as the cost. Also, we compared the PEC between the two groups through telephone interviews.

Results: The number of waiting days and visits, as well as the cost, were significantly reduced ($p < 0.01$) in the study group. Also, the study group showed slightly higher mean values for the PEC components, with significant differences related to the waiting time, treatment with respect, and taking account of patient knowledge.

Discussion and conclusions: Reorganizing outpatient work routines could eliminate the need for locum doctors while maintaining patient satisfaction and reducing costs.

1. Introduction

The healthcare guarantee was established by law in Sweden in 2010. It implies that healthcare providers must grant all patients referred to the outpatient department an appointment for assessment and treatment within 90 days, primarily in the patient's county council and, if that is not possible, in another county council (Nordgren, 2012). When available medical resources are limited or the workload is heavy, as in certain orthopedic departments, the healthcare guarantee imposes challenges to meet the requirement. Also, when the healthcare guarantee is prioritized above other medical needs, there is a risk that important follow-up visits will be downgraded and delayed with serious consequences (Nordgren, 2012). One solution has been to employ doctors on a hired locum basis with high healthcare expenses and worsened patient-physician continuity. In their narrative review, Ferguson and Walshe discussed the

commonly held assumptions about locum practice's low quality and safety. They recommended further research to address this issue (Ferguson and Walshe, 2019). Another possible solution is reorganizing the outpatient work setting, whereby staff other than physicians can make the initial assessment. In a spinal surgery setting, physiotherapists with a special interest in spinal surgery can relieve spinal surgeons undertaking this task. Previous national and international studies have shown that in teamwork, where a physiotherapist makes the initial assessment, efficiency can be improved, and overall care can be more cost-effective. In their systematic review on triage processes for patients with spinal pain, outcomes measured, and markers of effectiveness, McEvoy et al. included 20 studies. They reported positive outcomes for wait times with high levels of patient and physician satisfaction. However, outcomes such as surgical conversion rates and selection accuracy were less clear (McEvoy et al., 2017). Meanwhile, Bath et al. studied the

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characteristics of participants in a physiotherapist spinal triage program. They concluded that triage assessment by physiotherapists could improve the efficiency of an orthopedic surgeon's caseload by reducing the number of non-surgical referrals and thus help to ensure more timely access to appropriate health care (Bath et al., 2012). Similarly, Roberts et al. found that advanced practice physiotherapists and spinal surgeons had a high level of agreement when triaging low-back pain patients. Also, physiotherapists could effectively reduce waiting lists by 70 %, reserving surgical consultations for those patients most likely to require the surgeon's skills (Robarts et al., 2017).

In the present study, we sought to study the effect of reorganizing the work routines of the assessment of referred patients with spinal disorders. The primary aim was to determine whether the healthcare guarantee could be met without employing additional locum doctors. A secondary aim was to evaluate the cost-effectiveness and the patient's experience of care (PEC) associated with the new re-organization.

1.1. Material and Methods

This study was conducted between 1st February and September 1, 2014.

The standard routine was used between 1st February and 15th May. This routine brought about all referrals of patients with spinal complaints being first evaluated by a spinal surgeon. When the referred patient was deemed appropriate for further clinical assessment, a visit to a spinal surgeon (ordinary or locum) was booked at the outpatient department. During the study period, all referrals were assessed by two senior consultants.

For the standard routine, 71 patients were included (control group).

The new routine was introduced between the 16th May and the 1st September. This routine implied that a spinal surgeon first evaluated all referral notes of patients with spinal complaints. The referral should include a clear question, medical history and clinical examination, including a neurological examination. In addition, there should be magnetic resonance imaging (MRI) of the spine not older than 12 months. Patients with increasing neurological deficits or those referred by orthopedic surgeons were booked for clinical assessment by a spinal surgeon (ordinary or locum) at the outpatient department. All other patients were assigned for clinical examination by a physiotherapist from the spinal surgery team. All physiotherapists in this study have a university degree in physiotherapy, which includes 3 years of full-time study. They are all experienced physiotherapists with at least 10 years of experience with patients with back disorders including prehabilitation and rehabilitation. Within 2 weeks after the visit to the physiotherapist, the patient's medical history and clinical and radiological findings were discussed at a patient conference where a spinal surgeon, 2 to 3 physiotherapists, and a medical secretary participated. If a patient was considered eligible for surgical intervention, they were appointed for a follow-up visit to the spinal surgeon. The patient and the referring physician were informed by phone or letter. The procedure is consistent with Swedish legislation.

For the new routine, 71 patients were included (study group).

For both groups, calculations were made for the number of days between the referral date and the first appointment date at the spinal surgery clinic (within 90 days is required to meet the healthcare guarantee), the number of visits, who examined the patient at each appointment, the number of visits to the spinal surgeon, and the proportion of surgical interventions undertaken. The hourly and total costs of the spinal surgeon visits were obtained from invoices submitted to the orthopedic department. Other payroll costs were calculated with the assistance of the finance department.

To evaluate PEC in both groups, 50 patients from the control group and 50 patients from the study group were interviewed by telephone call conducted by the survey company Indikator. Patients were selected consecutively, and all agreed to participate. The Indikator company has been engaged in patient-experienced healthcare follow-up since the

early 2000s and has established various validated survey tools for postal patient questionnaires, telephone interviews, focus groups, interactive survey stations, and observational studies in collaboration with international research experts, patient groups, and healthcare professionals (Indikator, 2023). The PEC was estimated through eleven questions representing important domains of care (waiting time, physicians' and other healthcare professionals' conduct, involvement, discharge information, and overall care evaluation). Each question is assigned a value from 0 to 1, where 1 represents the most positive response option. The proportion of respondents for each relevant option is then multiplied by the option's value. The calculation method for patient-perceived quality results in a figure between 0 and 1. To simplify reporting, the results are presented as whole numbers within the 0–100 range, where higher values are indicative of a more positive experience.

1.2. Statistical analysis

The sample size was chosen in agreement with Indikator, and a total of 100 interviews were considered relevant for this study. This sample size for a two-group study would give a power of 80 % and a maximum standardized difference of 10 %.

Proportions are described as percentages and in numbers (n). Fisher's exact test was used to determine any significant difference between categorical variables, and independent two-sample t-tests were used for continuous variables. The continuous variables are described as means with 95 % confidence intervals (CI). The significance level was set to 0.05.

2. Results

The healthcare guarantee was largely met in both groups (97 % of the control group and 94 % of the study group). In the control group, 70 % (n = 50) of patients were examined by locum doctors while the need for locum doctors to cope with new visits in the study group was eliminated.

As a result of the reduced recruitment of locum doctors, the direct cost of a new visit was almost halved from SEK 732 (locum doctors) to SEK 372 (physiotherapist), $p < 0.001$. The cost of the reception visits alone (hourly cost \times appointment time) for 71 patients decreased from SEK 66,865 in the control group to SEK 33,871 in the study group, $p < 0.001$.

The proportion of follow-up visits was reduced from 39 % (28/71) in the control group to 27 % (15/56) in the study group, while the proportion of doctor visits that resulted in surgical intervention increased from 13 % in the control group to 53 % in the study group (all $p < 0.001$).

The total number of patients waiting for clinical assessment (new visits + follow-up visits) decreased in the study group compared to the control group (Fig. 1). In addition, the study group patients showed slightly higher mean values for the PEC compared to the control group.

Of the 11 items in the tool, one was equivocal, and the other 10 were all higher in the study group, with 3 statistically significant at the 5 % level (the waiting time, treatment with respect, and taking account of patient knowledge, Table 1).

3. Discussion

The present study has shown that the new routine of interprofessional teamwork in the care of patients with spinal disorders (study group), compared to the old routine (control group) led to better cost-effectiveness and comparable or better PEC, without negatively affecting the waiting time required for the healthcare guarantee. This service redesign can be considered as a Quality Improvement (QI) initiative, using the Plan-Do-Study-Act approach, where we identified the key issue (plan), measured the existing service (do), evaluated it (study), and then introduced the new service to include physiotherapists

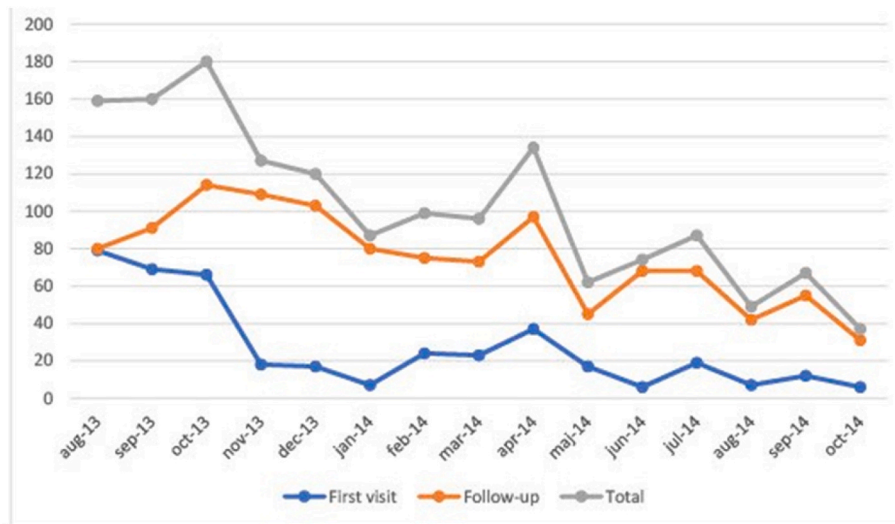


Fig. 1. Number of pending new visits, follow-up visits, and the total number of pending visits from August 2013 to October 2014.

Table 1

The response alternatives for each question have been converted into a continuous variable with 95 percent confidence intervals in parentheses. The value can vary between 0 and 100, where 100 indicates the highest level of patient satisfaction.

Questions	Control Group	Study Group	p-value
How long did it take from the first contact with the clinic (alternatively being referred to the clinic) until your first visit?	49 (39–59)	65 (54–76)	0.11
What do you think about the time you had to wait?	62 (49–75)	76 (64–87)	0.14
Did you get sufficient time to discuss your condition at the examination?	78 (68–88)	90 (83–97)	0.10
Did the person who examined you take sufficient account of your knowledge regarding your problems?	71 (60–82)	91 (84–98)	0.01
Did you trust the person who examined you?	76 (65–87)	86 (77–95)	0.20
Did you feel that you were treated with respect and in a considerate manner by the person who examined you?	80 (70–90)	94 (89–99)	0.04
How long did it take from the time of your first visit until you received a diagnosis, or a reply based on the examination?	60 (47–73)	71 (60–82)	0.26
What do you think about the time you had to wait?	63 (47–79)	91 (83–99)	0.004
Did you feel that you were treated with respect and sympathetically by the clinic staff?	89 (81–97)	96 (92–100)	0.18
Did you feel involved in your care and treatment decisions as much as you hoped you would?	73 (62–84)	73 (63–83)	0.93
How do you evaluate the investigation of your back problems conducted at the clinic?	49 (40–57)	57 (49–66)	0.38

(act). Indeed, since we finished the study and obtained the results, the new routine has been implemented in our department with continued satisfaction among our staff and patients.

When considering whether to hire a substitute physiotherapist to provide aspects of care in place of a primary care physician, health financiers and service providers need information about the marginal impact of the substitute physiotherapist; including evidence of the safety, effectiveness, and cost-effectiveness of the physiotherapist’s care compared to that of the primary care physician. The new routine evaluated in this study has several medical checkpoints to ensure giving the

referred patients correct attention and priority. First, the referral report is always assessed by a spinal surgeon. Then, a standardized clinical examination is conducted by a physiotherapist from the spinal team. At this point, the patient has the additional advantage of directly starting the required physiotherapeutic treatment. Finally, the patient’s clinical picture and manifestations are discussed in a conference with a seminar format where the entire spinal team attends to discuss the appropriate treatment options. This really creates a space to discuss each patient with a multimodal approach, which has not been possible in the past. Furthermore, patients are always notified by phone or letter, hence, there is always a possibility of feedback if not satisfied with the decision. Also, the patients receive the spinal surgery clinic’s phone numbers and email addresses. This setup could bring the patient a sense of being carefully investigated, a parameter of great importance from a patient’s perspective (Davis et al., 2013; Hopayian and Notley, 2014).

In a systematic review of the literature published until 2015, Marks et al. aimed to establish the impact on patients and health services of substituting doctors with physiotherapists in the management of common musculoskeletal disorders (Marks et al., 2017). They included several studies dealing with different orthopedic patients and found, among other results, that physiotherapists were more conservative in recommending surgical interventions and more cost-effective than orthopedic surgeons, without compromising their diagnostic accuracy. Furthermore, satisfaction among patients assessed by physiotherapists was comparable to or higher than satisfaction among patients assessed by orthopedic surgeons (Aiken et al., 2007; Aiken et al., 2008; Kennedy et al., 2010; Large et al., 2014; Daker-White et al., 1999; Desmeules et al., 2013; Ludvigsson and Enthoven, 2011). The authors concluded that physiotherapists provided a professional alternative to doctors for musculoskeletal disorders, but the health-economic implications of this model needed further evaluation.

To avoid methodological errors, we chose to appoint an independent research body, the Indikator, to assess PEC using a multidimensional questionnaire that has been previously studied (Knutsson et al., 2022; Sayed-Noor and Knutsson, 2024). The long experience of Indikator in this field adds to the validity and reliability of the study’s PEC results. However, this study has a few limitations, including the relatively small sample size in each group, which could mask eventual differences between the two groups. This can be noted in Table 1, where more than one question showed a tendency to a statistically significant difference between the two groups (p-value between 0.20 and 0.05). Additionally, the healthcare guarantee, spinal team setup, and the patients’ expectations and acceptance of the working model can all be related to regional conditions that are dependent on specific organizational and cultural

presumptions. There were also indirect costs for each patient that were not accounted for, such as patient conference costs. However, the patient conference could largely replace unscheduled consultations, including phone, postal, and email correspondence. The model could pose a threat to patient safety, and the time-lapse between data collection and publication could affect the generalizability. However, the model has been in use for almost 10 years and is virtually unchanged. There have been no serious patient safety incidents. Finally, the psychometric properties of the Indikator tool are not very well documented.

4. Conclusion

The substitution of orthopedic surgeons for physiotherapists in the present working model could eliminate the need for locum doctors while maintaining patient satisfaction and reducing costs. The study's results could motivate the introduction of new working models with hybrid setups where an orthopedic surgeon could supervise several physiotherapists in busy spinal surgery outpatient departments to enhance patients' healthcare accessibility and cost-effectiveness.

Informed consent statement

Patient consent was obtained from all patients.

Author contributions

Arkan S Sayed-Noor: Investigation, Data Curation, Writing – Original Draft, Writing – Review & Editing. Thomas Torstensson: Conceptualization, Methodology, Writing – Original Draft, Writing – Review & Editing. Björn Knutsson: Conceptualization, Methodology, Investigation, Data analysis, Writing – Review & Editing, Project administration, Supervision. Institutional review board statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the local Ethics Committee of Umeå University.

Data availability statement

The database will be available upon reasonable request to the corresponding author. The statistical analysis plan and syntax will be made available upon request.

Declaration of interests

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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