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Integrated care cases

Integration of healthcare rehabilitation in chronic conditions

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Abstract

Introduction: Quality of care provided to people with chronic conditions does not often fulfil standards of care in Denmark and in other countries. Inadequate organisation of healthcare systems has been identified as one of the most important causes for observed performance inadequacies, and providing integrated healthcare has been identified as an important organisational challenge for healthcare systems. Three entities—Bispebjerg University Hospital, the City of Copenhagen, and the GPs in Copenhagen—collaborated on a quality improvement project focusing on integration and implementation of rehabilitation programmes in four conditions.

Description of care practice: Four multidisciplinary rehabilitation intervention programmes, one for each chronic condition: chronic obstructive pulmonary disease, type 2 diabetes, chronic heart failure, and falls in elderly people were developed and implemented during the project period. The chronic care model was used as a framework for support of implementing and integration of the four rehabilitation programmes.

Conclusion and discussion: The chronic care model provided support for implementing rehabilitation programmes for four chronic conditions in Bispebjerg University Hospital, the City of Copenhagen, and GPs' offices. New management practices were developed, known practices were improved to support integration, and known practices were used for implementation purposes. Several barriers to integrated care were identified.

Keywords

quality of care, integration of healthcare, chronic conditions, chronic care model, rehabilitation, chronic obstructive pulmonary disease

Introduction

Quality of care provided to people with chronic conditions does not often fulfil standards of care in Denmark [1–3] and in other countries [4, 5]. In particular, rehabilitation programmes for people with chronic conditions are seldom offered [6, 7], even though they reduce risks for progression of disease and development of complications and improve quality of life [8–16]. Inadequate organisation of healthcare systems has been identified as one of the most important causes for observed performance inadequacies [17, 18], and providing integrated healthcare has been identified as an important organisational challenge for healthcare systems [10, 19, 20].

Providing integrated healthcare in the Danish healthcare system is challenged by governance that is split among three entities: regions are responsible for hospitals, municipalities oversee health promotion and rehabilitation, and GPs working from private offices are patients' main caregivers and gatekeepers [21, 22]. The GPs have much power through their collective agreements and often act independently of the regions. This divided structure leads to very different cultures in each organisation. Moreover, neither payment incentives nor information systems are aligned between organisations, adding to the lack of integration. A recent paper reported that only 50% of managers and health professionals in the Danish healthcare system perceived the integration of healthcare to be satisfactory [23].

In the present study, we used the chronic care model as a framework that "summarizes the basic elements for improving care in chronic conditions in health systems at the community, organisation, practice, and patient levels" and has been shown to improve care in chronic conditions [24, 25]. In addition, a conceptual framework for integration and collaboration in and between organisations was used to support the development of new management practices and the improvement of existing ones [26]. Four main forms of integration defined by the level of vertical and horizontal integration are described: contracting, co-ordination, collaboration and co-operation. The highest levels of integration result from co-operation incorporating both horizontal and vertical integration.

Three organisations—Bispebjerg University Hospital, the City of Copenhagen, and the GPs in Copenhagen—collaborated on a quality improvement project focusing on integration and implementation of rehabilitation programmes in four chronic conditions: chronic obstructive pulmonary disease (COPD), type 2 diabetes, chronic heart failure, and falls in elderly people [27]. The project took place from 2004 to 2007. The programmes have since become part of routine care provided to patients with chronic conditions, with the exception of the diabetes programme in Bispebjerg hospital, which continued with usual care due to resource constraints.

The introduction of the Structural Reform and a new healthcare act in Denmark in 2007 increased the focus on integration of care in chronic conditions and coordination of rehabilitation programmes [22]. The aim of this paper is to describe the process and results of a project that led to the development of new management practices and improvement of existing ones to support integrated care between three healthcare organisations.

Healthcare organisations

Bispebjerg University Hospital is one of five somatic hospitals in Copenhagen. It serves a population of ~300,000 citizens with 700 beds, 300,000 referrals and outpatient visits per year, and 3500 employees. Four hospital units specialise in providing rehabilitation programmes for the chronic conditions we studied.

The city of Copenhagen has ~503,000 citizens, 67,000 of whom live in the Østerbro area. Among all citizens in Østerbro, an estimated 5.6% have COPD, 2.6% have type 2 diabetes, and 4.6% have CHF. Among citizens older than 65 years, an estimated 33% have at least one fall per year. The number of citizens with COPD is ~3750. According to global initiative for chronic obstructive lung disease (GOLD) standards, 1985 of these were estimated to have moderate pulmonary function, and 338 patients were estimated to have severe or very severe COPD [28].

The Østerbro healthcare centre, which opened in 2005 as part of this project, provides rehabilitation programmes to patients with one or more of these conditions who are referred by their GPs [29]. The centre staff comprises 2 nurses, 2 physiotherapists, 1 dietician, and a part-time secretary.

Fifty-seven GPs, 60% of whom are in solo practices, serve the area of Østerbro.

Project organisation

A project group planned and supported processes of the project; it included two specialists (in geriatrics and internal medicine), a specialist physiotherapist and a nurse specialist. The project leaders supported communication between hospital management and department leadership to support vertical integration. The project leaders also maintained ongoing communications with the leadership of the healthcare centre

and representatives of the GPs. In addition, the project built on organisational structures already in place and included 'a steering committee' and four working groups, one for each chronic condition.

Chronic care model support for implementing multidisciplinary rehabilitation programmes

Four multidisciplinary rehabilitation programmes, one for each chronic condition, were developed in four working groups in 2004 and 2005 and implemented during the following two years. Programme implementation was facilitated by management practices described in the chronic care model under the various model elements: organisation of healthcare, decision support, self-management support, delivery system design, clinical information systems, and community.

Organisation of healthcare

Two new management practices were developed to support implementation and develop integration between organisations. *Between-organisation leadership* was fundamental to improving integration between the organisations. A steering committee at the highest hierarchical level of the three organisations developed integration by supporting collaboration between representatives of hospital management, the GPs, and the City of Copenhagen. The committee met regularly to sustain the development and implementation of the rehabilitation programme, improve integration between organisations, and decide on important aspects of the programme that mattered for all three organisations, such as approval of the clinical guidelines and implementation of management practices. The steering committee also approved stratification rules specifying where patients should participate in rehabilitation programmes.

At a lower organisational level, four working groups included leaders from the hospital departments and the healthcare centre, representatives of the GPs, and specialists from the hospital, such as nurses, physiotherapists, and dieticians. The working groups, one for each of the four chronic conditions, were established to accomplish two main tasks: 1) developing horizontally integrated healthcare for four chronic conditions, and 2) supporting development and implementation of four rehabilitation programmes across three organisations. The rehabilitation programmes were, in effect, contracts between the management and the leadership level of the departments, the healthcare centre and GP representatives in the respective organisations and among health professionals within and between organisations.

At the lowest organisational level, networking meetings were initiated in the form of *knowledge-sharing meetings* for each condition. These were regularly attended by health professionals from the rehabilitation units in the hospital and from the healthcare centre. Leaders in the hospital departments and the healthcare centres shared responsibility for the meetings, the goals of which were to develop the expertise of participating health professionals and to create a shared understanding of differences in cultures, skills and tasks between organisations. The meetings had invited presentations; members shared clinical experiences and discussed challenges reaching performance goals.

Decision support

Known management practices were developed to support integrated care. *Clinical guidelines* specific to each condition were developed in the four working groups; guideline components included physical training, patient education, smoking cessation, dietary modifications, and a follow-up programme based on the clinical evidence. Guidelines were rigorously reviewed before implementation by the steering committee, hospital department leaders, leading representatives of the GPs, and health professionals of the city of Copenhagen. Guidelines for GPs concerning diagnosing, testing, and referral procedures were developed and underwent the same review procedure.

Stratification rules defining whether patients should receive rehabilitation in the hospital or in the healthcare centre were developed in the COPD working group and approved by the steering committee. Stratification rules were also decided for the three other conditions in the project. COPD patients were stratified according to the global initiative for chronic obstructive lung disease (GOLD) standards, which are based on spirometry tests and the patients' perception of pulmonary function, as measured by the Medical Research Council (MRC) scale [30, 31]. Patients with forced expiratory volume in the first second (FEV_1) <30% of expected value according to age, gender and ethnicity, and MRC ≥3 received COPD rehabilitation at Bispebjerg hospital, and patients with 30% ≤FEV_1 ≤80% and MRC ≥3 received rehabilitation in the healthcare centre.

Rehabilitation programmes were conducted in group settings, included the elements noted above, and covered the path of care from the first visit in a GP's office or the hospital outpatient clinic through completion of the follow-up programme. Rehabilitation programmes were added to usual care programmes; pharmaceutical treatment continued as usual. The patient's GP

or specialist continued to as the main care giver and received a discharge letter after the seven weeks long rehabilitation COPD programme finished, specifying results that had been achieved and outlining goals for the future.

Self-management support

Patients started the rehabilitation programmes with *motivational dialogues* during which they developed *personal action plans* in collaboration with health professionals. *Patient education programmes* for each of the four conditions were provided in structured modules.

Delivery system design

Teaching programmes for the personnel at the three organisations, such as nurses and therapists, were introduced to improve their skills at providing care for patients with chronic conditions. The teaching programmes mixed participants from all three organisations to enable them to gain insight into other care settings and to support networking.

Teamwork was essential for providing optimal care in the multidisciplinary programmes. Care was provided by condition-specific teams that included a nurse, a physiotherapist and, as needed, a dietician. The hospital specialist taught in the hospital's patient education programmes.

Clinical information systems

The hospital, the healthcare centre and the GPs used different clinical information systems. Limited information could be transmitted between systems; this was a main barrier for knowledge sharing. Most communications were based on fax transmission, mail or telephone calls. Databases to record project data were developed for the hospital and for the healthcare centre. *Identical performance measures* were used for each condition across all three organisations to support quality development processes in and between the organisations.

Community

One-year follow-up included programmes in the rehabilitation units in the hospital and in the Østerbro healthcare centre, as well as classes in local sport centres and in community-based teaching organisations. Patients continued to receive care with either their GP or their specialist after the programme finished.

Assessment of the project

Internal evaluation

The internal evaluation of the project was based on surveys assessing GPs' opinion of collaboration with the healthcare centre and patient satisfaction with the programmes provided by the healthcare centre. Patient performance measurements before and after finishing rehabilitation programmes in the hospital and in the healthcare centre were included. We report here the impact of the COPD rehabilitation programmes; results from the other programmes are reported elsewhere [32–34].

The 57 GPs in Østerbro received a mailed questionnaire to solicit their opinion on various aspects of collaborating with the healthcare centre. One reminder letter was mailed if the GP did not answer within two weeks.

A questionnaire solicited patient opinions about the rehabilitation programmes in the healthcare centre; it was distributed at the centre to a purposive sample of 38 consecutive patients. The questionnaire was developed from validated instruments used with comparable patient groups, interviews with health professionals in the healthcare centre, and focus group interviews with a heterogeneous group of healthcare centre patients [35–37]. The first version of the questionnaire was evaluated by six patients and by a group of health professionals; in response to their comments, revisions were incorporated into the final questionnaire.

The clinical impact of the programmes was tested by measurement at baseline and after programme completion.

Nutritional status was assessed from BMI and waistline measurements. Pulmonary function was assessed from the FEV_1, FEV_1/forced vital capacity (FVC), the MRC dyspnoea scale, and the Borg test [38, 39]. Physical function was assessed from the shuttle walk test, the chair stand test, and the 2.45-meter up-and-go test [39, 40]. Patient self-assessment of functional level was assessed by the Avlund scale [41]. Quality of life was tested by the health outcome assessment scale SF-36 and the clinical COPD questionnaire (CCQ) [42, 43].

We used the Student's t-test to assess the statistical significance of changes in continuous data between pre- and post-measures and the χ^2-test to assess non-parametric data, identifying a p-value of <5% as denoting statistical significance. All analyses were performed by the statistical software programme package SPSS 13.0.

External evaluation

The external evaluation was carried out by the National Institute of Public Health, a research institute under the Faculty of Health Sciences, University of Southern Denmark. The external evaluation used qualitative methods and semi-structured interviews with key informants, including the leadership of the hospital and healthcare centres, a leading representative for the GPs, the project leaders, health professionals in the hospital and in the healthcare centre, and GPs. Observations from knowledge-sharing meetings were also used in the evaluation.

Interviews and observations focused on the following dimensions of integration: relevance of the new organisation of healthcare, perceived level of integration, quality of care, and barriers to integration.

Results

Integration of care based on management practices of the chronic care model

The organisation of the project supported integration of healthcare, as did the use of management practices suggested by the chronic care model as a framework for implementing the four rehabilitation programmes. The new management practices we developed included between-organisation leadership and knowledge-sharing meetings. Known practices were improved to support integration, including the use of clinical guidelines, population stratification, consistent performance measures, and teaching programmes for staff across the three organisations. Known practices used for implementation purposes included patient action plans, patient education, and team work.

Patient assessment of the healthcare centre

The questionnaire was completed by a sample of 38 consecutive patients, of whom 19 were women (50%); the mean age of all respondents was 65 years. Ten patients had type 2 diabetes, ten had COPD, seven had CHF, five had a history of falls, and six had more than one diagnosis. All were satisfied with their initial motivational dialogue about the rehabilitation programme, and 34 (89%) were satisfied with their exit dialogue at the conclusion of the rehabilitation programme. Thirty-six (95%) patients were satisfied with the rehabilitation programmes, 33 (86%) patients changed their habits regarding physical exercise, and 16 (42%) changed their dietary habits.

General practitioner referral patterns and assessment of the healthcare centre

Fifty-one of 57 GPs (90%) in Østerbro referred patients to the Østerbro healthcare centre or Bispebjerg hospital rehabilitation units. Forty-four (77%) GPs in Østerbro answered the mailed questionnaire. Of those responding to the survey, 42 (96%) found the rehabilitation programmes to be valuable for their patients with chronic conditions, 21 (48%) found that the collaboration with the healthcare centre was fulfilling, 20 (46%) found that it was acceptable, and 3 (6%) found that the collaboration was unsatisfactory. Only 16 (39%) of GPs found that the discharge summary fulfilled their needs for information on patients; 11 (25%) found that the discharge summary lacked some important information, 1 (2%) was dissatisfied with the discharge summary, and 15 (34%) did not have an opinion on the adequacy of the discharge summary.

About one-third (34%) of the GPs did not acknowledge any barriers to collaboration with the healthcare centre. Half of the GPs found that the tests required to refer patients to the programmes were too extensive and somewhat confusing; this was a barrier to referring patients to the healthcare centre. The GPs did not understand why the healthcare centres needed verification of the patient's condition by various test results. About one-fourth of the GPs found it problematic to decide to which of the city's programmes patients should be referred as several programmes for elderly patients with chronic conditions were offered.

COPD clinical and functional status

As noted earlier, 338 patients were estimated as suffering from severe and very severe COPD based on GOLD classification and should have qualified to receive rehabilitation in the hospital based on the stratification rules. Ninety consecutive patients with severe or very severe COPD were referred by either the pulmonary specialist in Bispebjerg hospital or a GP to the hospital rehabilitation programme, corresponding to 26.6% of the population that could have benefited from taking part in the rehabilitation programme. Of the 90 patients referred for the programme, 66 (73%) completed it. Their mean age was 70 years, 30 (33%) were men and 79 (88%) were active or previous smokers. Pulmonary function showed a mean FEV_1 of

33% of expected value for age, gender and ethnicity (Table 1).

The mean score on the MRC scale was 3.4. Nutritional status was normal before start of the programme and remained unchanged. Physical function tests all improved to a statistically significant degree: the shuttle walk test improved by 92%, the chair stand by 20%, and the 2.45-meter up-and-go test by 13% (Table 2).

Patient assessment of physical functional level, as measured by the CCQ scale, improved slightly, as did quality of life the SF-36; the quality of life as measured by the Avlund scale improved to a statistically significant degree. The mental component summary of the SF-36 questionnaire improved significantly, while the physical component summary remained unchanged.

Nineteen hundred and eighty-five patients were estimated to suffer from moderate COPD in the Østerbro local area. One hundred and thirty-one consecutive patients with moderate COPD were referred to the Østerbro healthcare centre rehabilitation programme, corresponding to 6.6% of the population which could have benefited from rehabilitation. Of these, 74 (84%) were referred by their GP, and 14 (16%) were referred by a Bispebjerg hospital pulmonary specialist; all 88 (67%) completed the programme. The mean age of patients referred to the healthcare centre was 70 years, 42 (32%) were men, and 54 (41%) were active smokers. Pulmonary function showed a mean FEV_1 of 52% of expected value for age and sex. The mean MRC scale score was 2.7. Nutritional status was normal before start of the programme and remained unchanged; physical function improved significantly. Patient assessment of physical function improved to a statistically significant degree, as did quality of life. The physical summary score of the SF-36 improved, while the mental component remained unchanged.

Table 1. Patients receiving COPD rehabilitation

	Bispebjerg hospital COPD—rehabilitation unit	Østerbro healthcare centre
Number of patients	90	131
Age (range)	70 (42–85)	70 (35–89)
Gender		
Female	60 (66%)	89 (68%)
Male	30 (33%)	42 (32%)
Tobacco use	79 (88%)[a]	54 (41%)[b]
Mean BMI (SD)	24 (5)	27 (6)
Mean waistline (SD)	92 (15)	98 (16)
FEV_1 (SD)	37 (14)	52 (17)
FEV_1/FVC (SD)	47 (13)	62 (15)
MRC score (SD)	3.4 (0.9)	2.7 (1.2)
Borg test score (SD)	4.8 (1.7)	5.7 (2.1)

BMI=body mass index; MRC=Medical Research Council scale in COPD patients; FEV_1=forced expiratory volume in first second expressed as percentage of expected value for age and sex; FEV_1/FVC=percentage of forced vital capacity expired in the first second of maximal expiration; SD=standard deviation.
[a]Previous or current smoker.
[b]Current smoker.

External assessments of integration and quality of care

The interviews and observations focused on the following dimensions of integration: the new organisation of healthcare, perceived level of integration, quality of

Table 2. Changes in physical function and quality of life[a]

	Bispebjerg hospital		Østerbro healthcare centre	
	Pre	Post	Pre	Post
BMI	24 (5)	24 (5)	27 (5)	27 (5)
Waistline[b]	92 (5)	91 (4)	98 (16)	95 (15)
Shuttle walk[c]	183 (94)	348 (289)**	213 (74)	573 (424)**
Chair stand[c]	10 (3)	12 (3)**	11 (4)	14 (5)**
2.45 meter 'Up and Go'[c]	8 (2)	7 (2)**	9 (4)	7 (3)**
CCQ total score	2.4 (1.1)	2.3 (1.2)	1.9 (0.9)	1.6 (0.8)*
Avlund scale score	8 (2)	9 (2)**	9.9 (1.9)	10.7 (1.5)**
SF-36 physical component summary score	31 (7)	32 (9)	36 (9)	38 (19)*
SF-36 mental component summary score	46 (13)	49 (12)*	48 (12)	50 (11)

BMI=body mass index; CCQ=clinical COPD questionnaire.
[a]Presented as mean (standard deviation).
[b]Measured in centimetres.
[c]Measured in seconds.
*Statistically significant at p<0.05.
**Statistically significant at p<0.01.

care and barriers to integration. The external evaluation concluded that the project had developed new methods and practices that supported integration of healthcare between organisations. Health professionals found the established collaboration forums, such as working groups and knowledge-sharing meetings, very important. The interviewed professionals found it important that the guidelines were developed across institutional borders and that new settings for collaboration were initiated.

Collaborative relationships between health professionals at the hospital rehabilitation units and the healthcare centre were perceived to be very supportive of improved care. The collaboration between health professionals from three organisations in the working groups was perceived to be very important to integration. The knowledge-sharing meetings provided possibilities for collective education of health professionals from the hospital and the healthcare centre and were perceived as very important, especially by professionals from the healthcare centre. The project has changed the professionals' attitudes regarding integration of care and thereby created new possibilities for further integration.

Health professionals in the hospital rehabilitation units felt that they were isolated in relation to the outpatient clinics and the clinical departments; they proposed that continuing to share experiences, acquired knowledge, and challenges between the rehabilitation units would be beneficial. Before the project, there was not much collaboration between the departments, outpatient clinics and the rehabilitation unit in the hospital, nor was collaboration very developed between the rehabilitation units in different specialities.

All those interviewed found that the rehabilitation programmes' quality of care was substantially improved. The expertise represented by professionals from the hospital was perceived as especially important by professionals at the healthcare centre.

With respect to barriers to integration, the project leaders reported that there had been support from hospital management and from the city of Copenhagen, but that the professional leadership of the hospital departments did not always support the project. At the project start, there was some resistance both from the GPs and from the specialists; the latter did not expect that the GPs or the professionals in the city of Copenhagen would have the skills for provision of high quality care. The GPs found that the stratification and referral procedures were cumbersome, and several GPs found that the stratification rules did not make sense.

Discussion

Assessment of organisational developments

The chronic care model provided support for implementing rehabilitation programmes for four chronic conditions in Bispebjerg University Hospital, the City of Copenhagen, and GP offices. The development of improved integration was supported by the theory on integration, which states the need for both vertical and horizontal integration to be in place supporting specialised care in different organisations [26]. The understanding that a high level of integration builds on hierarchical coordination within organisations and is combined with strong collaboration between organisations supported the organisation of the project and development of two new management practices and improvement of known practices.

It was important to our project goal that health professionals in three different organisations work together. Improved integration of healthcare was supported by development of new management practices and improved use of known practices. The project lead enhanced communications between the management level and the leadership of the departments to support vertical integration in the hospital. The project leaders also had ongoing communications with the leadership of the healthcare centre and representatives of the GPs. The collaboration between leadership in three organisations supported horizontal and vertical integration that is critical to high levels of integration. The health professional leadership of the departments collaborated in the working groups, supporting the development of identical multidisciplinary rehabilitation programmes for three organisations. The collaboration at the provider level in the knowledge-sharing meetings was important for integration. The project also used several supportive methods, such as identical rehabilitation programmes developed in collaboration between organisations, agreement on stratification rules, and use of identical performance measures to achieve a high level of both vertical and horizontal integration between the organisations.

In our project, teams worked in their own organisations and met at networking meetings at regular intervals to support integration. Other studies have shown that a comparable networking model is useful [44]. Inter-organisational collaboration has been successful in public health and is often supported by multidisciplinary teams [26].

A study of integrated health care in Sweden identified determinants supporting the development of inte-

grated care: dedication of professionals, legitimacy, and confidence [45]. In the present study, dedication of professionals was an obvious prerequisite for the project, as was project leadership. The involvement of the leadership of the three organisations gave the project a generally high level of legitimacy and engendered confidence in the underlying concepts.

Patients were, in general, very satisfied with the healthcare centre rehabilitation programmes. Although only 42% of patients improved dietary habits, 86% reported improved physical exercise habits. However, the sample of patients was small; the mean age of respondents and the proportion who were women were lower than that of COPD patients at the healthcare centre; as a result, we generalize with caution from this patient sample to the population consisting of COPD patients at the healthcare centre.

The GPs in the community found that the rehabilitation programmes were valuable for their patients but that their collaboration with the healthcare centre needed improvement. Only approximately half of the GPs were satisfied with their collaboration with the healthcare centre.

In general, the external evaluation yielded positive conclusions. However, the external evaluation also identified areas for potential improvement, such as collaboration in the hospital between rehabilitation units and support from department leadership.

We also identified several barriers to integrated care. These included both culture related barriers and organisational barriers. The barriers may be related to differences in care provided and specialisation levels, different patient populations, information technology systems that could not communicate, misaligned economic incentives, and established ways of providing care that did not support sharing patients between organisations.

Assessment of rehabilitation programmes

Only 6.6% of the patients estimated to have moderate COPD received rehabilitation in the healthcare centre; this was far from reaching the estimated population of 1985 patients. The rate of 26.6% of estimated patients with severe or very severe COPD receiving rehabilitation in the hospital was more satisfactory. It may be questioned if there are some individuals in the population with moderate COPD that might benefit more from the programme than others. We evaluated outcomes of COPD rehabilitation in terms of patient outcomes for the hospital- and community-based programmes and patient and physician satisfaction with the community-based programme. The hospital population was sicker, as demonstrated by their pulmonary function and physical functions; this was to be expected from the stratification rules and, in fact, indicated they operated effectively. Patients in both the hospital and the healthcare centre benefited from the rehabilitation programmes, as measured by physical function levels and improved quality of life; this is congruent with the findings of other studies [12, 46]. The results from the hospital rehabilitation programme showed that patients' physical functional levels improved more than expected when compared to a similar population [47]. Regarding quality of life measures, improvements in the CCQ values both in the hospital and in the healthcare centre were clinically significant and indicate that patients' perceptions of pulmonary symptoms improved during the programmes. The generic short-term 36-item questionnaire identified differences before and after the programme, which is in line with some studies [47] and in contrast to others [48, 49].

Lessons for the future and suggestions for research

To create a high level of engagement, it is important to involve from the beginning all stakeholders of projects aiming to improve integrated healthcare. While specific strategies increased the degree of horizontal and vertical integration between and within organisations, they did not entirely eliminate integration issues. Further study of strategies for promoting integration is warranted. A useful avenue for future research would be the development of a tool or system for routinely assessing the level of integration in healthcare, particularly in relation to organisational goals and expectations [50–53].

The barriers to integration were both cultural and organisational, and integration of IT systems and alignment of financial incentives seem to be very important for integration.

Conclusions

The chronic care model and theory on integration of care provided great support for the implementation of multidisciplinary rehabilitation programmes. Integration of care between organisations depends on improved collaboration at the leadership level of involved organisations and networking between professionals at the provider level. The study revealed both cultural and organisational barriers. The way forward is to ensure collaboration between leadership and healthcare providers of organisations and to align financial incentives and employ interoperable IT systems that can transfer data between organisations.

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Authors' contributions

Anne Frølich designed the concept and conducted the study, collected, analysed and interpreted data, and the drafted the manuscript. Dorte Høst conducted the study, collected, analysed and interpreted data and commented on the manuscript. Helle Schnor conducted the study, collected and interpreted data. Annette Nørgaard conducted the study, collected, analysed and interpreted data, and commented on the manuscript. Cecilia Ravn-Jensen collected and interpreted data and commented on the manuscript. Eva Borg conducted the study, collected and interpreted data. Carsten Hendriksen designed the concept and conducted the study, collected, analysed and interpreted data, and commented on the manuscript.

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