Early workplace dialogue in physiotherapy practice improved work ability at 1-year follow-up—WorkUp, a randomised controlled trial in primary care

Charlotte P. Sennehed[a,b,c,*], Sara Holmberg[c,d], Iben Axén[e], Kjerstin Stigmar[b,f], Malin Forsbrand[a,b,g], Ingemar F. Petersson[a,h], Birgitta Grahn[a,b,c]

Abstract

Workplace involvement in rehabilitation for patients with musculoskeletal pain may improve work ability. Convergence Dialogue Meeting (CDM) is a model aimed at helping the patient, the care giver, and the employer to support work ability and return-to-work. Our aim was to study the effect on work ability when adding a workplace dialogue according to CDM in physiotherapy practice for patients with pain in ordinary primary care. We conducted a prospective pairwise cluster randomised controlled trial (ClinicalTrials.gov ID: NCT02609750) in primary care involving 20 primary care rehabilitation units with 1-year follow-up. Adult patients with acute/subacute neck and back pain, worked ≥4 weeks past year and not currently on sick leave or no more than 60 days of sick leave and considered at-risk of sick leave were included (n = 352). All patients received structured physiotherapy and the intervention was the addition of CDM, delivered by the treating physiotherapist. The main confirmatory outcome, work ability (defined as working at least 4 consecutive weeks at follow-up), was assessed by a weekly short text message question on number of sick leave days past week. Work ability was reached by significantly more patients in the intervention group (108/127, 85%) compared with the reference group (127/171, 74%) ($P = 0.02$). The intervention increased the odds of having work ability at 1-year follow-up, also after adjustment for baseline health-related quality of life (odds ratio 1.85, confidence interval 1.01-3.38). We conclude that an early workplace dialogue in addition to structured physiotherapy improved work ability significantly.

Keywords: Work ability, Workplace dialogue, Neck and back pain, Sick leave, Primary care

1. Introduction

Work disability due to musculoskeletal pain is one of the main causes of sick leave in western societies,[5,19,53] and these patients constitute a large group seeking help in primary care.[26,30] Work disability causes both personal, economic, public, and health burdens[6] as well as productivity losses.[11] During 2012, 20% to 30% of the total number of visits to primary care in Sweden were patients with musculoskeletal pain,[49] and

patients with back pain used twice as much health care resources compared with the overall population.[27] The recurrence of such pain is high, about one-third of patients with previous acute back pain will have a recurrence episode within 1 year.[38] The odds of a recurrence within 1 year triple when the patient experiences more than 2 previous episodes of back pain.[38]

Work ability is a concept that is described from different perspectives[34] but in general as a relational concept, ie, that an individual's capacity must be viewed in relation to different work demands[34] and can relate to either continuing work, avoiding sickness absence, or returning to work after sick leave. Reported predictors of work ability are physical demands at the workplace,[45] workplace involvement and interventions,[4,15,22,36,51] income level,[47] urban or rural residence[32] psychological factors,[20] pain and disability levels, educational level and socioeconomic status, workplace factors,[12,25] health-related quality of life,[21] and self-prediction of possible return-to-work.[12,31,35]

A recent review on interventions with the intention to reduce sick leave for patients with musculoskeletal pain have shown evidence for multidomain interventions including workplace modifications.[16] The SWAP study found that a vocational advice service in primary care was successful in improving work ability for patients with musculoskeletal pain.[54] "Convergence Dialogue Meetings" (CDMs) were developed in Sweden for patients on sick leave due to burnout.[29] The CDM model is a 3-step structured interview model where the patient, the health care provider, and the employer meet for shared discussions on concrete suggestions and actions to support sustainable work ability and, when applicable, return-to-work. The CDM model has been shown to

improve return-to-work for patients on long-term sick leave due to burnout.[28] The CDM model has so far not been tested for patients with musculoskeletal pain consulting in primary care.

Most patients in working age with musculoskeletal pain consulting physiotherapy in primary care are in early stages of illness/disease and mostly in work. Traditionally, the treatments in primary care have focused on pain reduction and promotion of function. Despite the fact that musculoskeletal pain is a strong risk factor for disability and work loss,[5,19,26,30,53] primary care has not so far focused on promoting work ability in early stages of illness. The aim was to study the effect of an early workplace intervention with CDM on work ability for patients with acute/subacute neck/back pain in ordinary primary care when added to structured physiotherapy.

2. Methods

2.1. Design

We conducted a pairwise prospective cluster randomised controlled trial, with inclusion of patients from January 2013 through December 2014, ClinicalTrials.gov ID: NCT02609750. The WorkUp study was approved by the Regional Ethical Review Board in Lund Dnr 2012/497 (September 28, 2012), Dnr 2012/648, (October 30, 2012), and Dnr 2012/833 (January 9, 2013).

2.2. Outcome

The predefined main confirmatory outcome was work ability measured as no days of sick leave or disability pension for 4 consecutive weeks at 1 year after baseline.[23] In this study, having work ability was defined as working or being eligible to the labor market. Thus, we defined work ability as any paid work, regardless of any adjustments in work duties or of working time. Because this study includes early cases, work adjustments are expected to be few.

2.3. Setting

All existing public and private primary care centers in Southern Sweden (n = 210) that were accredited and tax-financed by the county councils in Skåne, Kronoberg, and Blekinge were invited to participate in the study. Within these centers, primary care patients have open access to physiotherapy, and in Swedish health care, physiotherapy is often the first-line treatment for patients with musculoskeletal pain. Primary care physiotherapy is organised in different ways, some centers have their own physiotherapists, but most have it in common with others at primary care rehabilitation units. If the patient is unable to work, there is a need for a doctor's certificate from day 8 that confirms a diagnosis, the functional limitation, and activity restriction. In Sweden, the first 14 days of sick leave are paid by the employer, but sick leave longer than 14 days is economically compensated by the Swedish Social Insurance Agency.

2.4. Randomisation

In total, 32 primary care centers corresponding to 20 primary care rehabilitation units stated an interest in participating in the WorkUp study. These rehabilitation units were classified based on size (registered population), community size of the units' location, and the patients' morbidity; Adjusted Clinical Groups[13,44,52] and socioeconomic status; and Care Need Index.[39,48] Primary care rehabilitation units that were as similar

as possible, based on the criteria above, were matched in pairs. The randomisation process was performed by an independent statistician who used a computer-generated program (random sample uniform distribution). The primary care rehabilitation units' pairs were randomised pairwise to 10 intervention primary care rehabilitation units and 10 reference primary care rehabilitation units (**Fig. 1**). The primary care rehabilitation units' staff (including physiotherapists) and the patients could for obvious reasons not be blinded to allocation. Each included primary care rehabilitation unit, and all physiotherapists working at the unit were either an intervention unit or a reference unit, never mixed.

2.5. Population

Patients, 18 to 67 years of age, seeking physiotherapy in ordinary primary care due to acute or subacute (<12 weeks) neck and/or back pain were eligible for inclusion. It could hence be either a first episode or a recurrent episode of neck and/or back pain after a period of at least 3 months of no substantial pain. Patients not on sick leave or with no more than 60 days of sick leave and considered at-risk by scoring ≥40 points at the "ÖMPSQ-short"[37] and who had been working at least 4 consecutive weeks the past year were asked to participate in the study. The cutoff for the ÖMPSQ short is normally set at ≥50 points, but we decided to lower this cutoff to ≥40 points. The lower cutoff was chosen because we wanted to include patients at-risk for work disability at an early stage and clinically relevant for treatment in primary care. Exclusion criteria were: full time disability pension, addiction diagnose, on-going medical treatment of acute disease, pregnancy, and not able to understand the Swedish language. After screening, inclusion resulted in 146 intervention patients and 206 reference patients (**Fig. 1**).

2.6. Procedure

Patients meeting inclusion criteria were invited consecutively to participate. No record was kept regarding the number of ineligible and nonconsenting patients, or the reasons for this. Eligible and consenting patients were informed about the study verbally and in writing including the fact whether their primary care rehabilitation unit was randomised to either intervention or reference. The patients signed an informed consent. All patients were examined by a physiotherapist, red flags were considered and all patients answered a baseline questionnaire. Based on needs, contacts with other professionals could be included, such as doctor, psychologist, occupational therapist, employee, or staff manager. Further remittance to these professions was based on ordinary clinical assessments, such as red and yellow flags. The treatment was structured (including examination, assessment, diagnosis, evidence-based treatment, and follow-up as a standard procedure among physiotherapists in Sweden) and individualised in terms of content and duration in both groups according to each patient's condition. Within the framework of the study, all participants in both the intervention and the reference groups were offered visits to the physiotherapist for follow-up examinations at 3, 6, and 12 months after baseline (number not shown). The follow-ups were for monitoring and for measuring function, which will be reported in future articles. The patients had the opportunity to discuss issues relating to their pain and to get advice if needed. Both the intervention and the reference group also received a short text message every week during 52 weeks after baseline for follow-up of study outcome. The short text messages were for monitoring self-reports on sick leave.
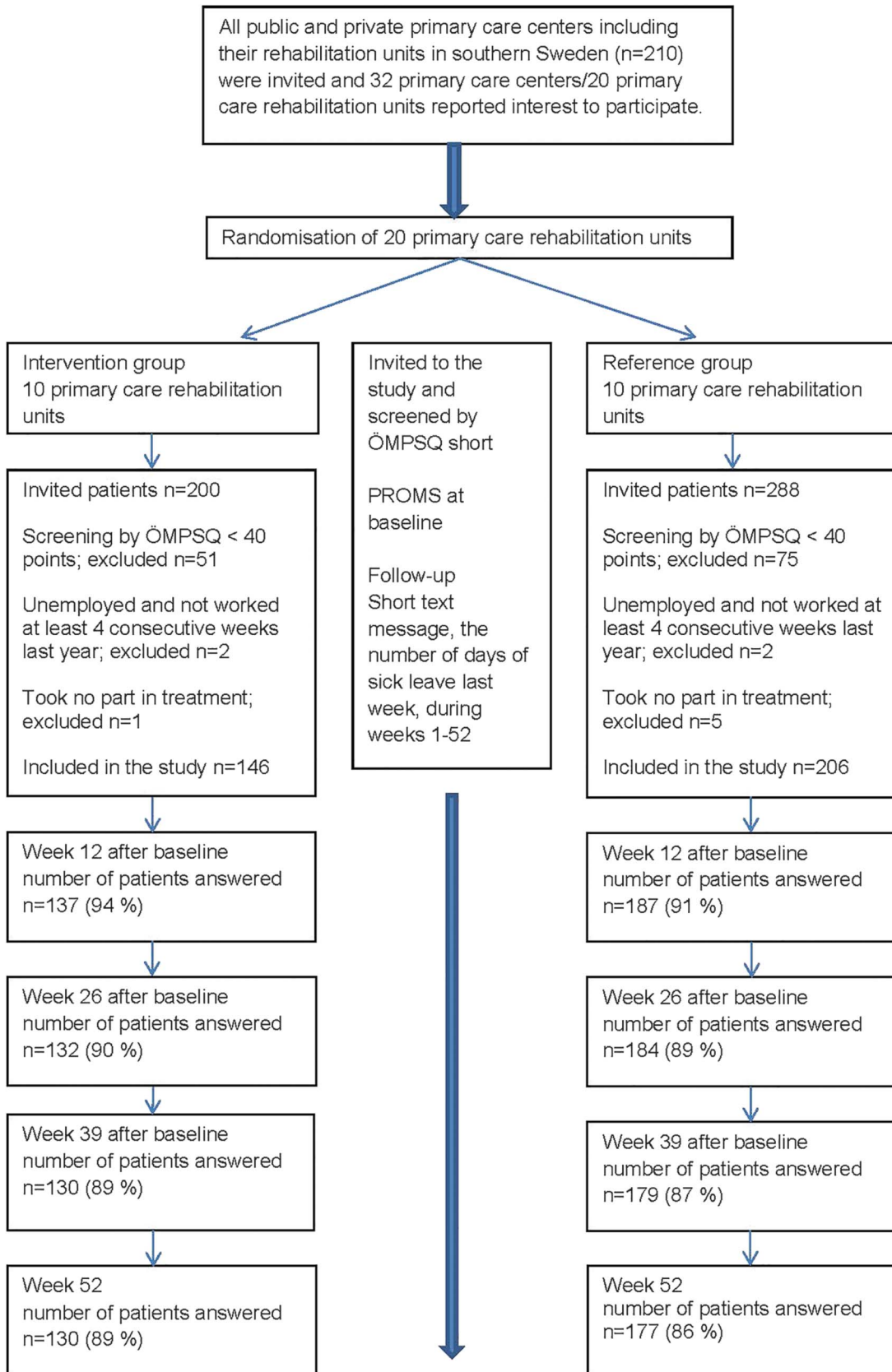
Figure 1. Flowchart of inclusion and follow-up of primary care rehabilitation units. The proportion of patients who reported days on sick leave past week, by answering the text message.

2.7. Baseline and follow-up measurements

Patients in both groups answered a baseline questionnaire regarding sex, age, marital status, education, employment, sick leave, and health-related quality of life. Health-related quality of life was measured with the EQ-5D question-naire.[21,41] We used the 5-question part of the EQ-5D, where each question has 3 options from 1 to 3, where 1 corresponds to full health-related quality of life. The answers were merged into a total score from −0.59 to 1, according to the UK tariff, where 1 corresponds to full health-related quality of life.[9,10,17] Further patient-reported outcomes and clinician-reported outcomes were collected at the different follow-ups, but is to be published elsewhere.

2.8. Short text message

We used a software called SMS-Track Questionnaire to collect data with short text message concerning past week's number of days on sick leave.[1] Collecting self-reported weekly data using short text messages has been used in previous clinical studies and worked well with high-response rates.[1–3,33] It has been shown that patient-reported outcomes, directly from patients, can provide more sensitive and specific measurements of treatment effects.[40,50] All questions and answers were encrypted and stored in a secure database, accessible to the first author through the web, password, and firewall protected. The patients answered the question "Last week, how many days were you on sick leave? Please answer with a number between 0 and 7." They responded with a number and all data were immediately collected in the database for subsequent analysis. Reminders were automatically sent to nonresponders after 2 days by sending the question a second time. If there was no answer to the second message, the database recorded it as missing. In case of missing answers also in the following week, the patient was contacted by phone and if the patient could not be reached, a reminder letter was sent. The flowchart shows the response rate (**Figures 1 and 2**).
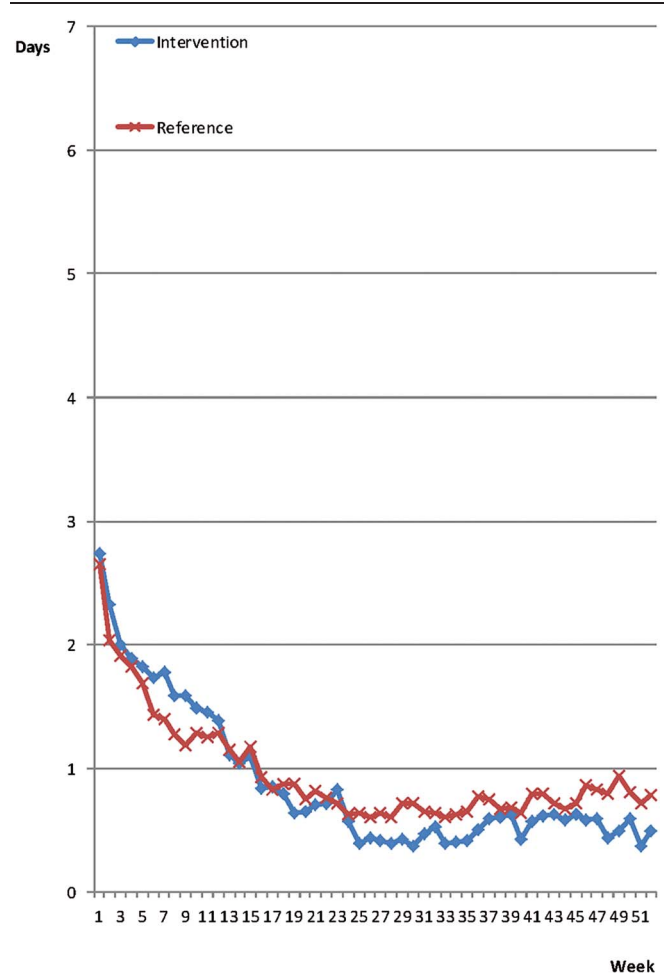
2.9. Intervention

Patients in the intervention group were offered CDM by their treating physiotherapist in addition to the structured physiotherapy care. The physiotherapist started CDM by inviting the patient to an individual interview where the patient gave her/his informed consent of contacting the employer. In the second step, the employer was invited to talk to the physiotherapist, either in person or by phone. The conversations with the patient and the employer focused on the neck/back pain in relation to work and on possible or already conducted workplace adjustments to support return-to-work or to stay at work. Finally, the patient and the employer were invited to a meeting together with the physiotherapist. This meeting aimed at a plan of action with a written record of suggested workplace changes/improvements as well as changes to the patient's daily life with the aim of strengthening the patient's work ability and/or supporting return-to-work (**Fig. 3**). This agreement was followed up when the patient met the physiotherapist at follow-up visits at month 3, 6, and 12 after baseline. At the intervention units, all physiotherapists were educated and trained in the CDM model by experienced personnel from the research group with background in occupational health. This training consisted of 2 half-day theoretical and practical sessions. In addition, continuous support was provided during the implementation of the study by the same personnel, who were available by telephone if matters should arise that needed discussion.
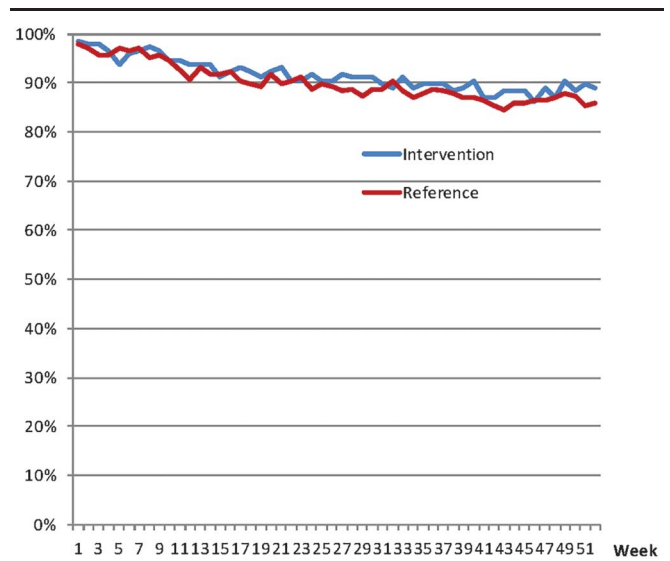
Figure 2. Proportion of text message answers per week after baseline, during 52 weeks, intervention n = 146 and reference n = 206.

2.10. Statistics

Statistical power calculations were based on a significance level of 5% and a power of 80%. To detect a 30% reduction of sick leave in the intervention group and a 10% reduction of sick leave

Figure 3. Self-reported sick leave days per week, collected using weekly text messages, intervention n = 146, and reference n = 206.

in the reference group and an intraclass range between 0.1 and 0.4,[18] we needed a minimum of 20 clusters/primary care rehabilitation units. The estimated sample size was slightly more than 500 patients in total (259 patients per group).

Age was categorised into 3 groups (≤39 years, 40-49 years, and ≥50 years). Marital status was categorised into married/cohabitation vs single. Education level was categorised into 4 groups (primary school, upper secondary school 2-3 years, university ≥3 years, and other). Diagnoses were categorised into 4 groups (cervicobrachial syndrome, cervico and lumbar syndrome, lumbago-ischias, and myalgia). Employment was categorised as yes or no. The EQ-5D score was categorised into 2 groups < and ≥0.6, based on previous findings on how health-related quality of life relates to work ability.[7,8,21] Sick leave was categorised into yes or no. Descriptive statistics for baseline variables were analysed with the χ^2 test for proportions. Comparisons were made between the groups over time and were analysed at baseline and at 3, 6, 9, and 12 months with the χ^2 test with a significance level $P < 0.05$. In addition, a strict intention-to-treat analysis was performed, patients with missing data for the confirmatory outcome were allocated outcomes in accordance with baseline data, in that no sick leave at baseline was assigned as work ability at 1 year. Finally, a forward stepwise logistic regression analysis was performed to assess the odds

ratio of work ability (no sick leave or disability pension) 4 consecutive weeks at 1 year after baseline. The tested independent variables were sex, education level (high/low), and health-related quality of life (EQ-5D </≥0.6 at baseline). The significance level was $P < 0.05$.

3. Results

The randomisation was successful and at baseline, the intervention group and the reference group were largely comparable, ie, no significant differences were seen for any variable. The study included 230 women and 122 men, they were equally distributed in the 3 age groups (≤39, 40-49, and ≥50 years) and 76% were married/cohabiting. Approximately half the patients had secondary education and approximately one-fifth had university education. Nearly 70% had lumbar pain and about 30% neck pain. About 96% reported that they worked (employed n = 313, self-employed n = 12, and students n = 12). The remaining 4% (n = 15) were at baseline, unemployed. A third, 35%, were on sick leave at baseline (point prevalence self-report with a dichotomous answer yes/no) and most of these individuals were on 100% sick leave. Health-related quality of life was impaired in both groups (**Table 1**). The ÖMSPQ-short mean score at baseline was in the intervention group 52 (SD 9, range 40-81)

Table 1

Baseline data intervention and reference group.

	Intervention (n = 146)		Reference (n = 206)		P
	n	%	n	%	
Men	54	37.0	68	33.0	0.426
Women	92	63.0	138	67.0	
Age					0.742
≤39 y	50	34.2	73	35.4	
40-49 y	45	30.8	56	27.2	
≥50 y	50	34.2	76	36.9	
Marital status*					0.490
Married/cohabitation	34	23.3	47	22.8	
Single	112	76.7	157	76.2	
Education†					0.425
Primary school	16	11.0	14	6.8	
Upper sec school 2-3 y	69	47.3	107	51.9	
University ≥3 y	28	19.2	49	23.8	
Other	33	22.6	35	16.9	
Diagnoses					0.812
Cervicobrachial syndrome‡	27	18.5	49	23.8	
Cervical and lumbar syndrome§	9	6.2	12	5.8	
Lumbago-ischias‖	102	69.9	140	68.0	
Myalgia¶	8	5.5	5	2.4	
Employed†					0.290
Yes	142	97.2	194	94.6	
No	4	2.8	11	5.4	
Sick leave#					0.910
Yes	51	34.9	74	35.9	
If yes, 100% sick leave	40	78.4	62	83.8	
EQ5D grouped#					0.223
≥0.6	93	63.7	119	57.8	

* Reference-2 missing.
† Reference-1 missing.
‡ M530, M531, and M542.
# Intervention-2 missing and reference-1 missing.
§ Combination 4 and 5.
‖ M543, M544, M545, and M546.
¶ M791.

and in the reference group 54 (SD 9, range 40-83), $P = 0.131$. The response rates for the short text messages were high for both the intervention and the reference groups throughout the follow-up year, 84% to 99% of patients responded weekly (**Figs. 1 and 2**).

Days of sick leave decreased in both groups during the follow-up time (**Fig. 3**). The number of individuals with work ability over 4 consecutive weeks (no sick leave days) decreased 3 months after baseline and increased successively thereafter in both groups. At 1-year follow-up, more patients in the intervention group had work ability compared with the reference group (108/127, 85% vs 127/171, 74%, $P = 0.02$, crude odds ratio 1.97 confidence interval [CI] 1.08-3.57) (**Fig. 4** and **Table 2**). The forward stepwise logistic regression analysis showed that patients in the intervention group reported work ability to a higher extent at 1 year compared with the reference group, also after adjustment for baseline health-related quality of life (odds ratio 1.85, CI 1.01-3.38). Data were missing for 54 patients for the main confirmatory outcome.
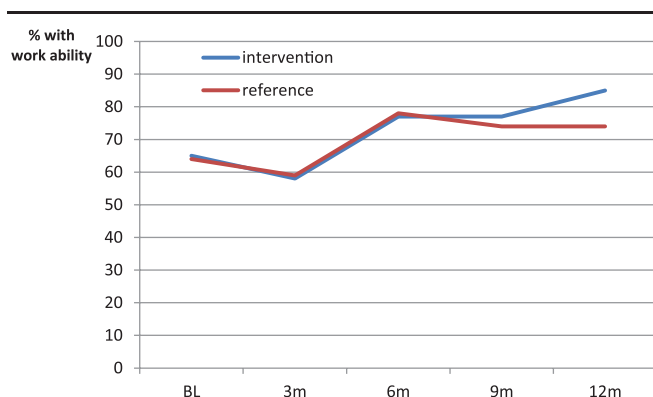
There were no differences at baseline in any of the studied variables between nonresponders (n = 54) and responders (data not shown). A strict intention-to-treat analysis showed the same result for work ability at 1-year follow-up (119/146, 82% vs 147/206, 72%, $P = 0.02$).

Patients with EQ-5D ≥0.6 at baseline were more likely to report work ability at 1 year compared with patients with EQ-5D <0.6, regardless of which group they belonged to (odds ratio 1.92, CI 1.09-3.40) (**Table 3**). There were no significant associations between sex or education level with work ability, and there were no significant interactions between sexes, education level, or health-related quality of life.

4. Discussion

We found that CDM in addition to structured physiotherapy resulted in significantly improved work ability at 1 year compared with physiotherapy only. This is in line with previous studies that emphasise the importance of workplace interventions.[4,15,22,36,51,54] The effect of the intervention was independent of health-related quality of life.

In a primary care model with "open access" to physiotherapy, patients with musculoskeletal pain are guided directly to physiotherapists, as a first-line treatment. The patients in primary care thus often meet the physiotherapist at an early stage of the musculoskeletal pain problems contrary to physiotherapeutic care in specialised rehabilitation clinics. It is unusual for primary care to contact the employer at early stages of ill health. Generally, employer contacts are taken through occupational health services and when actualised in primary, it is usually at later stages when the patient has a more pronounced morbidity or impaired work ability and it might be necessary to change work. If physiotherapists in primary care will address workplace issues, it is important that the physiotherapists have sufficient knowledge in the area of work and worker health and also useful tools to manage the questions and initiate actions. It must be emphasized that the effect of early workplace dialogue on work ability was shown at the end of the follow-up year. Whether this effect is sustainable in the long term will be analysed in a 3 year follow-up including also register data on sick leave. The result shows that employer contact in early phases of musculoskeletal pain may promote work ability at 1-year follow-up. This finding may indicate the importance of employer involvement early in the process. That the effect on work ability emerges first after 1 year may partly be due to the fact that workplace modifications are demanding processes involving patients/employees, workplace employers, other employees, and the social insurance system. Therefore, such interventions may take some time to be implemented.

The WorkUp research project tested whether it was possible for physiotherapists in primary care to be the point of contact with the employer and if this was a successful method to initiate a dialogue about adjustments at the workplace to strengthen the employee's work ability or return-to-work. Our results showed that CDM can be used for patients with musculoskeletal pain in primary care as previously tested only in patients with burnout.[28] In WorkUp, the method was modified and unimodal, in that 1 profession, the physiotherapist, was responsible for assessment, treatment, and the structured CDM model. However, several physiotherapists were performing the intervention, which is a strength. We considered involving other professions in the study, but the patients were in early stages of back/neck pain, working, or on short-term sick leave. At such early stages, engagement of more team members in primary care might give the patient indications that the problems are extensive and may therefore contribute to nocebo effects or medicalizations. Involvement of several professions might also have resulted in prolonging the time for treatment to start, which may be a risk factor for the development of long-term problems. To stratify care based on baseline, screening has shown positive effects on disability and is cost-effective.[24] Carlsson et al.[14] reported that early multidisciplinary assessment for patients with short sick leave resulted in increased sick leave compared with a reference

Table 2

Work ability (no sick leave or disability pension) at baseline and 4 consecutive weeks at 3, 6, 9, and 12 months after baseline, intervention = 146, reference n = 206.

Baseline and follow-up	Intervention		Reference		P*
	n = work ability	%†	n = work ability	%†	
Baseline‡	93	65	131	64	0.89
3-mo follow-up§	75	58	104	59	0.85
6-mo follow-up§	95	77	138	77	0.85
9-mo follow-up§	96	77	125	74	0.58
12-mo follow-up§	108	85	127	74	0.02

* χ^2 test between intervention and reference.
† Proportion in percent with work ability.
‡ Baseline point prevalence.
§ No days of sick leave for 4 consecutive weeks.

Figure 4. Proportion with work ability (no sick leave days) at baseline and 4 consecutive weeks month 3 (week 9-12), month 6 (week 23-26), month 9 (week 36-39), and month 12 (week 49-52) after baseline, intervention n = 146, reference n = 206. BL, baseline.

Table 3

Result of logistic regression analysis.

Model*	OR	95% CI for OR		P
		Lower	Upper	
Step 1				
Reference	1			
CDM intervention	1847	1011	3376	0.046
EQ-5D† <0.6	1			
EQ-5D ≥0.6	1921	1086	3398	0.025

Variables tested for, but not meeting the inclusion criteria, were sex and education level.
Odds ratio for having work ability 1 year after baseline.
* Forward stepwise logistic regression with $P < 0.05$ as inclusion and $P > 0.1$ as removal criterion.
† Health-related quality of life.
CDM, Convergence Dialogue Meeting; CI, confidence interval; OR, odds ratio.

group, which strengthened our decision of the unimodal WorkUp design. In cases where patients' needs increased during treatment, there were no obstacles to interact with multimodal interventions or to contact occupational health care or other specialised care. In the recent review of Cullen et al.,[16] a multidomain treatment approach is considered as having the best evidence for reducing time off work. According to the results of our study, inclusion of workplace intervention is important. We included a workplace intervention in physiotherapy practice, and this was found beneficial for patients with neck and/or back pain for return-to-work or staying at work after 1 year. It is conceivable for interventions like this to take some time to show effect, probably because new routines at the workplace take some time to be fully operational.

4.1. Methodological discussion

Few drop-outs over the follow-up indicate that the study was well designed and well implemented within the participating primary care rehabilitation units. Providing physiotherapy for both groups limited treatment bias and strengthens the clinical results of the trial. It was a new challenge for the physiotherapists to have contact with employers to discuss patients' needs for workplace action.[46] However, the implementation of CDM worked well at the majority of units with minor exceptions. In cluster trials, a potential problem is selection bias if inclusion is systematically different in intervention and control arms. A weakness of this study is that no record was kept regarding eligible but nonconsenting patients, thus hindering an evaluation of such bias. However, the high baseline comparability of the groups argues against any substantial selection bias.

The population of southern Sweden, where the study was conducted, represents approximately 20% of the Swedish population, and the characteristics of people living in the region are comparable with Sweden as a whole.[43] The primary care rehabilitation units had good geographical spread with localization in both smaller and larger communities as well as private and public modes of operation. The interventions were performed within the framework of regular clinical activities further strengthening the generalizability of results. The intended power for the study was not achieved, although the recruitment period was prolonged by 1 year. Despite this, significant results with higher work ability at 1 year after the CDM intervention were observed. This indicates an even higher potential for treatment effect than anticipated.

In Sweden, sick leave longer than 14 days is economically compensated by the Swedish Social Insurance Agency. The first 14 days are paid by the employer. Data from Social Insurance

Agency are usually used when studying sick leave in Sweden, but this is a rough measure since short-term sick leave is not included.

In this study, we used frequent weekly self-reports during 1 year which therefore covered all sick leaves, also the occasional days. Data retrieval using mobile phones/smart phones is a technology with new opportunities to retrieve frequent responses from respondents in research. The technology is cheap, takes a minimum of time, and involves minimal data handling. The use of short text messages has previously been tested and reported to be reliable when collecting weekly data in long-term follow-ups.[1–3] The method is recommended when studying conditions where individual variation, details of fluctuation, or periodicity are wanted. This study confirms that this was a successful method of collecting data on short-term sick leave over 1-year follow-up, as it resulted in high-response rates for both the intervention and the reference groups. This was a methodological achievement and contribution of this trial. There was as small proportion of patients who had trouble in managing smart phones or had poor mobile connection. These individuals were offered to respond by letter or by email, alternatively they were called weekly during the follow-up period. Their answers were then manually entered in the database. This alternative data collection was needed for 15 patients. Six patients responded by letter, 4 through phone calls, and 5 responded by email. The high-response rate during the follow-up was the result of the simplicity of the method and some flexibility to offer alternative solutions to receive weekly responses.

The final logistic regression analyses regarding work ability were based on the past 4 weeks of text message answers 1 year after baseline. There were some missing data for the confirmatory outcome collected by short text messages. We performed analyses on the patients reporting 1-year outcome, and in addition, we performed a strict intention-to-treat analysis including all patients. The results were similar strengthening the validity of our study.

To help patients to maintain work ability or support patients to return-to-work, actions directed towards both the individual and the working conditions are usually needed. Most previous rehabilitation studies focus on patients with chronic neck and/or back pain and return-to-work after sick leave.[42] In the WorkUp study, we focused interventions for patients with acute or subacute neck and/or back pain active on the labor market. Our results showed that adding the CDM intervention to structured physiotherapy care was a successful intervention to ensure work ability at 1-year follow-up. In parallel, an economic evaluation of the WorkUp study is under way. Patients', employers', and physiotherapists' experiences of early contacts between health care professionals and the workplace need to be further explored. Within the WorkUp trial, these questions will be addressed.

5. Conclusions

An early dialogue with the employer in addition to physiotherapy significantly improved work ability in comparison with structured physiotherapy only.

Conflict of interest statement

The authors have no conflict of interest to declare.

REHSAM project, Sweden, and the county councils in Skåne, Kronoberg, and Blekinge.

Acknowledgements

References

[1] Axen I, Bodin L, Bergstrom G, Halasz L, Lange F, Lovgren PW, Rosenbaum A, Leboeuf-Yde C, Jensen I. The use of weekly text messaging over 6 months was a feasible method for monitoring the clinical course of low back pain in patients seeking chiropractic care. J Clin Epidemiol 2012;65:454–61.

[2] Axen I, Bodin L, Kongsted A, Wedderkopp N, Jensen I, Bergstrom G. Analyzing repeated data collected by mobile phones and frequent text messages. An example of low back pain measured weekly for 18 weeks. BMC Med Res Methodol 2012;12:105.

[3] Axen I, Leboeuf-Yde C. Trajectories of low back pain. Best Pract Res Clin Rheumatol 2013;27:601–12.

[4] Bartys S, Frederiksen P, Bendix T, Burton K. System influences on work disability due to low back pain: an international evidence synthesis. Health Policy 2017;121:903–12.

[5] Bevan S, Quadrello T, McGee R, Mahdon M, Vavrovsky A, Barham L. Fit for work? Musculoskeletal Disorders in the European workforce. The Work Foundation, 2009. Available at: http://www.fitforworkeurope.eu/Website-Documents/Fit%20for%20Work%20pan-European%20report.pdf. Accessed June 8, 2016.

[6] Brox JI, Storheim K, Grotle M, Tveito TH, Indahl A, Eriksen HR. Systematic review of back schools, brief education, and fear-avoidance training for chronic low back pain. Spine J 2008;8:948–58.

[7] Burstrom K, Johannesson M, Diderichsen F. Health-related quality of life by disease and socio-economic group in the general population in Sweden. Health Policy 2001;55:51–69.

[8] Burstrom K, Johannesson M, Diderichsen F. Swedish population health-related quality of life results using the EQ-5D. Qual Life Res 2001;10:621–35.

[9] Burstrom K, Johannesson M, Rehnberg C. Deteriorating health status in Stockholm 1998-2002: results from repeated population surveys using the EQ-5D. Qual Life Res 2007;16:1547–53.

[10] Burstrom K, Sun S, Gerdtham UG, Henriksson M, Johannesson M, Levin LA, Zethraeus N. Swedish experience-based value sets for EQ-5D health states. Qual Life Res 2014;23:431–42.

[11] Campbell P, Wynne-Jones G, Muller S, Dunn KM. The influence of employment social support for risk and prognosis in nonspecific back pain: a systematic review and critical synthesis. Int Arch Occup Environ Health 2013;86:119–37.

[12] Cancelliere C, Donovan J, Stochkendahl MJ, Biscardi M, Ammendolia C, Myburgh C, Cassidy JD. Factors affecting return to work after injury or illness: best evidence synthesis of systematic reviews. Chiropr Man Therap 2016;24:32.

[13] Carlsson L, Borjesson U, Edgren L. Patient based "burden-of-illness" in Swedish primary health care. Applying the Johns Hopkins ACG case-mix system in a retrospective study of electronic patient records. Int J Health Plann Manage 2002;17:269–82.

[14] Carlsson L, Englund L, Hallqvist J, Wallman T. Early multidisciplinary assessment was associated with longer periods of sick leave: a randomized controlled trial in a primary health care centre. Scand J Prim Health Care 2013;31:141–6.

[15] Carroll C, Rick J, Pilgrim H, Cameron J, Hillage J. Workplace involvement improves return to work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions. Disabil Rehabil 2010;32:607–21.

[16] Cullen KL, Irvin E, Collie A, Clay F, Gensby U, Jennings PA, Hogg-Johnson S, Kristman V, Laberge M, Mc Kenzie D, Newman S, Palagyi A, Ruseckaite R, Sheppard DM, Shourie S, Steenstra I, Van Eers D, Amick III DC. Effectiveness of workplace interventions in return-to-work for musculoskeletal, pain-related and mental health conditions: an update of the evidence and messages for practitioners. J Occup Rehabil 2018;28:1–15.

[17] Dolan P. Modeling valuations for EuroQol health states. Med Care 1997;35:1095–108.

[18] Friedman L, Furberg C, DeMets D. Fundamentals of clinical trials. 4th ed. New York: Springer Ltd, 2010.

[19] Gerdle B, Bjork J, Coster L, Henriksson K, Henriksson C, Bengtsson A. Prevalence of widespread pain and associations with work status: a population study. BMC Musculoskelet Disord 2008;9:102.

[20] Gustafsson K, Lundh G, Svedberg P, Linder J, Alexanderson K, Marklund S. Psychological factors are related to return to work among long-term sickness absentees who have undergone a multidisciplinary medical assessment. J Rehabil Med 2013;45:186–91.

[21] Hansson E, Hansson T, Jonsson R. Predictors for work ability and disability in men and women with low-back or neck problems. Eur Spine J 2006;15:780–93.

[22] Haugli L, Maeland S, Magnussen LH. What facilitates return to work? Patients' experiences 3 years after occupational rehabilitation. J Occup Rehabil 2011;21:573–81.

[23] Heymans MW, de Vet HC, Knol DL, Bongers PM, Koes BW, van Mechelen W. Workers' beliefs and expectations affect return to work over 12 months. J Occup Rehabil 2006;16:685–95.

[24] Hill JC, Whitehurst DG, Lewis M, Bryan S, Dunn KM, Foster NE, Konstantinou K, Main CJ, Mason E, Somerville S, Sowden G, Vohora K, Hay EM. Comparison of stratified primary care management for low back pain with current best practice (STarT Back): a randomised controlled trial. Lancet 2011;378:1560–71.

[25] Huguet A, Tougas ME, Hayden J, McGrath PJ, Stinson JN, Chambers CT. Systematic review with meta-analysis of childhood and adolescent risk and prognostic factors for musculoskeletal pain. PAIN 2016;157:2640–56.

[26] Jordan KP, Kadam UT, Hayward R, Porcheret M, Young C, Croft P. Annual consultation prevalence of regional musculoskeletal problems in primary care: an observational study. BMC Musculoskelet Disord 2010;11:144.

[27] Joud A, Petersson IF, Englund M. Low back pain: epidemiology of consultations. Arthritis Care Res (Hoboken) 2012;64:1084–8.

[28] Karlson B, Jonsson P, Osterberg K. Long-term stability of return to work after a workplace-oriented intervention for patients on sick leave for burnout. BMC Public Health 2014;14:821.

[29] Karlson B, Jonsson P, Palsson B, Abjornsson G, Malmberg B, Larsson B, Osterberg K. Return to work after a workplace-oriented intervention for patients on sick-leave for burnout—a prospective controlled study. BMC Public Health 2010;10:301.

[30] Kinge JM, Knudsen AK, Skirbekk V, Vollset SE. Musculoskeletal disorders in Norway: prevalence of chronicity and use of primary and specialist health care services. BMC Musculoskelet Disord 2015;16:75.

[31] Larsson A, Karlqvist L, Westerberg M, Gard G. Identifying work ability promoting factors for home care aides and assistant nurses. BMC Musculoskelet Disord 2012;13:1.

[32] Lavoie CA, Voaklander D, Beach JR, Gross DP. The association between rurality and return to work for workers' compensation claimants with work-related musculoskeletal injuries: an analysis of workers who failed to return to work within typical healing time frames. Int J Occup Med Environ Health 2017;30:715–29.

[33] Leboeuf-Yde C, Jensen RK, Axen I. Absence of low back pain in patients followed weekly over one year with automated text messages. Chiropr Man Therap 2012;20:9.

[34] Lederer V, Loisel P, Rivard M, Champagne F. Exploring the diversity of conceptualizations of work (dis)ability: a scoping review of published definitions. J Occup Rehabil 2014;24:242–67.

[35] Lindell O, Johansson SE, Strender LE. Predictors of stable return-to-work in non-acute, non-specific spinal pain: low total prior sick-listing, high self prediction and young age. A two-year prospective cohort study. BMC Fam Pract 2010;11:53.

[36] Linton SJ, Boersma K, Traczyk M, Shaw W, Nicholas M. Early workplace communication and problem solving to prevent back disability: results of a randomized controlled trial among high-risk workers and their supervisors. J Occup Rehabil 2016;26:150–9.

[37] Linton SJ, Nicholas M, MacDonald S. Development of a short form of the Orebro musculoskeletal pain screening questionnaire. Spine (Phila Pa 1976) 2011;36:1891–5.

[38] Machado GC, Maher CG, Ferreira PH, Latimer J, Koes BW, Steffens D, Ferreira ML. Can recurrence after an acute episode of low back pain be predicted? Phys Ther 2017;97:889–95.

[39] Malmstrom M, Sundquist J, Bajekal M, Johansson SE. Indices of need and social deprivation for primary health care. Scand J Soc Med 1998;26:124–30.

[40] Patrick DL, Burke LB, Powers JH, Scott JA, Rock EP, Dawisha S, O'Neill R, Kennedy DL. Patient-reported outcomes to support medical product labeling claims: FDA perspective. Value Health 2007;10: S125–37.

[41] Rabin R, de Charro F. EQ-5D: a measure of health status from the EuroQol group. Ann Med 2001;33:337–43.

[42] SBU SAfHTAaAoSSS. Preventiva insatser vid akut smärta från rygg och nacke. Effekter av fysisk träning, manuell behandling och beteendepåverkande åtgärder [in Swedish] (Acute neck and back pain: preventive interventions. Effects of physical training, manual treatment and cognitive behavioral interventions). Available at: http://www.sbu.se/contentassets/fc9b009a51834b69b2dbc25f80fef475/prevention_smarta_160607.pdf. Accessed January 17, 2018.

[43] SCB, Statistics Sweden. Available at: http://www.statistikdatabasen.scb.se. Accessed November 14, 2017.

[44] Starfield B, Weiner J, Mumford L, Steinwachs D. Ambulatory care groups: a categorization of diagnoses for research and management. Health Serv Res 1991;26:53–74.

[45] Steenstra IA, Munhall C, Irvin E, Oranye N, Passmore S, Van Eerd D, Mahood Q, Hogg-Johnson S. Systematic review of prognostic factors for return to work in workers with sub acute and chronic low back pain. J Occup Rehabil 2017;27:369–81.

[46] Stigmar K, Ekdahl C, Borgquist L, Grahn B. How do physiotherapists perceive their role in work ability assessments? A prospective focus group study. Prim Health Care Res Dev 2014;15:268–76.

[47] Streibelt M, Egner U. A systematic review of the predictors of return to work following vocational retraining [in German]. Rehabilitation (Stuttg) 2013;52:111–18.

[48] Sundquist K, Malmström M, Johansson SE, Sundquisr J. Care Need Index, a useful tool for the distribution of primary health care resources. J Epidemiol Community Health 2003;57:347–52.

[49] The National Board of Health and Welfare S. Nationella riktlinjer rörelseorganens sjukdomar [in Swedish] (National guidelines musculoskeletal diseases). 2012. Available at: https://www.socialstyrelsen.se/Lists/Artikelkatalog/Attachments/18665/2012-5-1.pdf. Accessed September 28, 2015.

[50] Thorborg K, Tijssen M, Habets B, Bartels EM, Roos EM, Kemp J, Crossley KM, Hölmich P. Patient-reported outcome (PRO) questionnaires for young to middle-aged adults with hip and groin disability: a systematic review of the clinimetric evidence. Br J Sports Med 2015;49:812.

[51] van Oostrom SH, Driessen MT, de Vet HC, Franche RL, Schonstein E, Loisel P, van Mechelen W, Anema JR. Workplace interventions for preventing work disability. Cochrane Database Syst Rev 2009:CD006955.

[52] Weiner JP, Starfield BH, Steinwachs DM, Mumford LM. Development and application of a population-oriented measure of ambulatory care case-mix. Med Care 1991;29:452–72.

[53] Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, Shibuya K, Salomon JA. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease study 2010. Lancet 2012;380:2163–96.

[54] Wynne-Jones G, Artus M, Bishop A, Lawton SA, Lewis M, Jowett S, Kigozi J, Main C, Sowden G, Wathall S, Burton AK, van der Windt DA, Hay EM, Foster NE; SWAP Study Team. Effectiveness and costs of a vocational advice service to improve work outcomes in patients with musculoskeletal pain in primary care: a cluster randomised trial (SWAP trial ISRCTN 52269669). PAIN 2018;159:128–9.