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RECEIVED 23 February 2024

ACCEPTED 06 June 2024

PUBLISHED 28 June 2024

CITATION

Grewal S, Vos V, Theijse R, Klautz R and
Grewal N (2024) An in-hospital physiotherapy
clinic improves symptoms and absenteeism
among healthcare professionals with
musculoskeletal conditions.
Front. Environ. Health 3:1390764.
doi: 10.3389/fenvh.2024.1390764

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An in-hospital physiotherapy clinic improves symptoms and absenteeism among healthcare professionals with musculoskeletal conditions

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Introduction: The incidence of work-related musculoskeletal disorders has been consistently high in the healthcare sectors, with significant impact on quality of life of affected individuals and costs to health services due to absenteeism. This study assesses the effectiveness of an in-hospital physiotherapy clinic “*CollegaPoli*” for healthcare professionals with musculoskeletal conditions. The primary objective was to evaluate the effectiveness of the “*CollegaPoli*” on reduction of musculoskeletal symptoms. Secondary, readiness to return to work was studied.

Methods: A prospective observational study was conducted between October 2022 and June 2023. Healthcare professionals with musculoskeletal conditions resulting in sick leave were included. The effects of the “*CollegaPoli*” on reported symptoms and work absenteeism were evaluated.

Results: A total of 145 participants (84.1% female) were included in the study. Mainstream of participants reported musculoskeletal symptoms in the upper extremity (54.1%) and lower back (15.8%). Around 35% of the healthcare workers reported their symptoms to be present for 1–4 weeks, 25% since the past 7 days. The return-to-work program significantly reduced the musculoskeletal symptoms ($p < 0.001$) and led to an 80.3% decrease in reported absenteeism among participants.

Conclusion: This study supports the benefits of an in-hospital physiotherapy clinic among healthcare professionals with musculoskeletal disorders, improving symptoms and reducing absenteeism.

KEYWORDS

healthcare professionals, physiotherapy, musculoskeletal disorders, workload, absenteeism

1 Introduction

Work-related musculoskeletal disorders comprise over half of all reported occupational illnesses (1) and represent the second largest cause of short-term or temporary work disability after the common cold (2). Work-related musculoskeletal disorders are also reported to cause absenteeism, increased work restriction, decreased job satisfaction, and permanent disability than any other group of diseases (3–6) with a

considerable economic burden on the individual, the organization and the society as a whole (7).

There has been an increasing effort in recent years to investigate the causes of musculoskeletal disorders. Earlier studies have reported heavy physical work, psychosocial/organizational, and individual “risk factors” such as smoking and high body mass index for the development of work-related musculoskeletal disorders (8, 9). The most commonly reported biomechanical risk factors include excessive repetition, awkward postures, and heavy lifting (8).

Due to these risk factors, healthcare professionals form a vulnerable group for the development of musculoskeletal disorders (10–13). It is estimated that almost one-third of all cases of sick leave among health care workers are related to musculoskeletal disorders occurring in the spine, shoulders, and back (2, 14). A large majority of the conditions occur among nurses (50%–93%), surgeons (91%) and radiology technicians (91%) (15–17). Although health care professions are known to be at a high risk for work related musculoskeletal disorders, and account for 16% of the total Dutch workforce, it is one of the least-studied occupations till date (18).

The World Health Organization (WHO, 2018) estimates the population aged 60 and above to be two billion in 2050, requiring an increased number of healthy staff to provide healthcare services to older people. It is therefore important to identify how healthcare workers can maintain or regain ability to work and reduce absenteeism. Since musculoskeletal disorders account for a large majority of sick-leaves, workplace interventions to combat musculoskeletal complaints can be very beneficial, however are highly scarce at the same time. According to Oakman et al. interventions to reduce work related musculoskeletal disorders can be classified into five categories: (a) individual, (b) task-specific and equipment, (c) work organization and job design, (d) workplace environment, and (e) multifactorial (19). The individual category, which includes the interventions focused on changes to an individual’s working behavior, such as training, exercises, and education, has been found effective in reducing pain of healthcare workers (20). Currently, there is a substantial lack of workplace initiatives to prevent and treat musculoskeletal symptoms, with lack of resources and poor implementation consistently being mentioned as barriers of a successful intervention program (21). An important motivator to enhance adherence are interventions at the work-place supervised by an exercise instructor (22).

The aim of this study was to determine the effect of an in-hospital physiotherapy clinic “*CollegaPoli*” focused on changing individual working behavior on the perceived severity of musculoskeletal symptoms. We also analyzed the readiness to return to work among healthcare professionals after the physiotherapy sessions.

2 Materials and methods

The Flevo Hospital in the Netherlands developed an in-hospital physiotherapy clinic “*CollegaPoli*” for their healthcare professionals

with musculoskeletal conditions which resulted in sick leaves. Physiotherapy during the “*CollegaPoli*” was provided by three physiotherapists and was accessible for the healthcare workers during working hours, within 24 h of application. Each session lasted for 30 min, and the healthcare workers could visit the “*CollegaPoli*” multiple times. Each session was structured to provide a variety of exercises that were expected to help healthcare workers combat their musculoskeletal symptoms. The interventions were personalized by the physiotherapists according to the physical complaints of the participants. The physiotherapists have developed exercise programs (<https://nl.physitrack.com/exercises>) which are implemented in the clinical practice.

A prospective observational study was conducted between October 2022 and June 2023 to assess the effect of the “*CollegaPoli*”. A total of 145 healthcare workers consulted the in-house clinic. Inclusion criteria were active employment at the Flevo Hospital exclusion criteria were unwillingness to participate in the “*CollegaPoli*” research program and comorbid conditions such as uncontrolled heart failure or angina pectoris were strongly discouraged to participate in the “*CollegaPoli*” research program. Written informed consent was obtained from all patients and anonymity was strictly observed. The study was approved by the Human Research Ethics Committee from the Flevo Hospital and a waiver was obtained as data were acquired anonymously and no sociodemographic data were collected (May 2022).

As our objective was to determine the effect of an in-hospital physiotherapy clinic “*CollegaPoli*” on the perceived severity of musculoskeletal symptoms, the effects of the “*CollegaPoli*” on reported symptoms and absenteeism in healthcare professionals with musculoskeletal conditions were analyzed using self-reported instruments. Musculoskeletal symptoms were defined as impairments in the muscles, bones, and joints, characterized by pain and/or limitations in mobility and dexterity leading to temporary or lifelong limitations in functioning and participation in society. Location and severity of symptoms were assessed in all patients with open questions. Symptoms were scored on a Likert scale from 1 (no symptoms) to 10 (severe symptoms). Data were collected at baseline (i.e., the first session of “*CollegaPoli*”) and follow-up (i.e., after the last session of “*CollegaPoli*”).

2.1 Statistical analysis

Data analyses were performed with RStudio: Integrated Development Environment for R (software version 1.3.1093, Boston, MA). Univariate models were used for statistical analysis. Descriptive statistics were compiled to summarize characteristics. Binary variables are presented as percentages and frequencies, and numerical variables as means with corresponding interquartile ranges (IQR), *Student’s t-test* was performed to compare the mean of both groups. For all tests, statistical significance was defined as a two-tailed value of $P < 0.050$.

Based on reported sick leaves in the Flevo Hospital the prevalence of work-related musculoskeletal disorders leading to

absenteeism was reported as being 12% (0.12). Using a statistical significance α of 0.05, a power of 0.80, margin of error of 5% and estimated prevalence of 12% for a population size of 1,000, 140 healthcare workers was the required sample size. Assuming an additional 4% to account for the drop-out rate, the total number of healthcare workers required in the sample was 145. The sample size was estimated using a sample size calculation for a prevalence study.

3 Results

A total of 145 healthcare professionals consulted the in-hospital physiotherapy clinic “*CollegaPoli*” in the period between October 2022 and June 2023. Women made up most of the study population (84.1% female). Every participant completed the baseline and follow-up assessment. Majority of participants reported musculoskeletal symptoms in the upper extremity (52.4%) and lower back (15.9%) at baseline.

A quarter of the study population reported new onset symptoms in the past 7 days before consulting the “*CollegaPoli*”. Around 35% of the healthcare workers reported their symptoms to be present for 1–4 weeks and 22.1% of the participants had experienced symptoms for the past 1–3 months. Most

participants were informed about the “*CollegaPoli*” by their colleagues (71.7%), others were informed through the institutional social media (17.9%) (Table 1).

A total of 444 sessions took place, each lasting for 30 min. Participants visited the physiotherapy intervention for an average of 3 sessions. Symptoms were assessed on a Likert scale from 1 (no symptoms) to 10 (extreme symptoms). At baseline the participants reported an average symptom score of 7.7. After consulting the “*CollegaPoli*” and starting physiotherapy, healthcare workers reported a 49.4% decrease in symptoms (mean score 7.7 vs. 3.9 $p < 0.001$). Most benefit was noted in participants which experienced symptoms in the past 7 days (relative change 49.4%, $p < 0.001$). Physiotherapy resulted in a significant decrease in symptoms in participants which had symptoms less than a month or less than three months (relative change 49.4% and 47.4% respectively, $p < 0.001$). In participants which had experienced symptoms for longer than three months physiotherapy led to a significant decrease in symptoms, however with a lower relative change (27.5%) (Table 2).

Eighty-two percent of the healthcare professionals reported that the “*CollegaPoli*” reduced the sick-leave and led to an early return to work. Satisfaction with the in-hospital physiotherapy clinic was high among healthcare workers, almost all patients would recommend the “*CollegaPoli*” to treat musculoskeletal disorders.

4 Discussion

Musculoskeletal disorders are as one of the main causes of injury worldwide, indiscriminately affecting adult and young people, and causing significant disabilities (WHO 2019), posing a considerable burden to individuals, workplaces, and society worldwide. In the healthcare sector, occupational musculoskeletal disorders represent one of the main causes of injury among professionals (10–13). Most healthcare professionals report musculoskeletal complaints occurring in the spine, shoulders, and back (14).

High physical demands and musculoskeletal disorders are prevalent and possibly interrelated with problems among healthcare professionals (10, 23). Although it is increasingly recognized that the physical constraints lead to a decrease in job satisfaction (24) and a rise in work absenteeism, little has till date been studied about on site return-to-work interventions to

TABLE 1 Reference to *CollegaPoli*.

Reference to <i>CollegaPoli</i>	Total cohort scores ($n = 145$)
Already known	4 (2.8%)
Colleagues	104 (71.7%)
Flint (Institutional webpage)	26 (17.9%)
General practitioner	1 (0.7%)
Other physiotherapists	4 (2.8%)
Work council	1 (0.7%)
Working group “ <i>CollegaPoli</i> ”	1 (0.7%)
Other	3 (2.1%)
Unknown	1 (0.7%)
Those who would recommend “ <i>CollegaPoli</i> ”	144 (99.3%)
Active participation on work floor due to “ <i>CollegaPoli</i> ” (yes/no)	119 (82.1%)

Table 1 gives an overview of how patients were informed about the “*CollegaPoli*” intervention program.

TABLE 2 Symptoms reported by the participants.

Symptoms	Symptoms before treatment	Symptoms after treatment	Δ Score	Relative change	P -value
Overall ($n = 145$)	7.7 (7.0–8.0)	3.9 (2.0–5.0)	–3.8	49.4%	<0.001
Duration of symptoms	-	-	-	-	-
<7 days ($n = 41$)	7.6 (7.0–8.0)	3.3 (2.0–4.0)	–4.3	56.6%	<0.001
1–4 weeks ($n = 50$)	7.7 (7.0–8.8)	3.9 (2.0–6.0)	–3.8	49.4%	<0.001
1–3 months ($n = 32$)	7.6 (7.0–8.3)	4.0 (3.0–5.0)	–3.6	47.4%	<0.001
3–12 months ($n = 4$)	8 (7.8–8.3)	5.8 (4.8–6.5)	–2.2	27.5%	<0.001
>1 year ($n = 10$)	7.6 (7.3–8.8)	5.7 (4.0–7.0)	–1.9	25.0%	<0.001

Table 2 gives an overview of the symptoms before and after treatment and the duration of the symptoms. A significant reduction of symptoms was noted among the participants of *CollegaPoli*. The relative change in symptoms was greatest in the participants with symptoms lasting for less than 3 months.

improve these issues among healthcare workers. According to Oakman et al. interventions to reduce work-related musculoskeletal disorders can be classified into five categories being (a) individual, (b) task-specific and equipment, (c) work organization and job design, (d) workplace environment, and (e) multifactorial (19). A recent study showed that interventions focused on the individual's working behavior, such as training, exercises, and education are beneficial in reducing pain in healthcare workers (20). The aim of our study was to evaluate whether an in-hospital physiotherapy intervention could impact work ability and reduce absenteeism among healthcare professionals with musculoskeletal conditions. Healthcare workers at the Flevo Hospital were provided with an in-hospital physiotherapy clinic "CollegaPoli" which they could consult if they experienced any musculoskeletal disability interfering with their work ability.

Whereas several studies have reported a reduction in musculoskeletal pain in the neck, upper extremity, and low-back regions with physical exercise trainings at the workplace, most studies only targeted office workers and laboratory technicians and resulted in limited evidence (25–27). Lack of resources and poor implementation is consistently being mentioned as barriers of a successful intervention program (21). Motivators of exercise adherence on the other hand are training programs which are made available at the workplace and are supervised by exercise instructors (22).

In recent times, four studies evaluated the effect of an individualized approach to reduce work-related musculoskeletal symptoms. The interventions consisted of physical exercise (28, 29), cognitive behavior therapy (30) and neuromuscular exercise (31). Musculoskeletal pain was reduced in the studies which intervened with physical and neuromuscular exercise. In both studies of Jakobsen the physical intervention consisted of a 10-week intervention period receiving either physical exercise (5 × 10 min a week), coaching sessions and ergonomic training. Female healthcare workers were randomized to receive the intervention at work or physical exercise at home. The work-group intervention led to a significant reduction of musculoskeletal pain, pain intensity, analgesics intake and an improvement in wellbeing, job satisfaction, and motivation (28, 29).

In the current study, we also identified a significant reduction in musculoskeletal symptoms among healthcare workers after consulting the "CollegaPoli". Male and female participants were included in the study and symptoms were recorded pre- and post-intervention. At baseline more than 50% of our studied cohort reported musculoskeletal symptoms in the upper extremity (52.4%) followed by lower back symptoms (15.9%). The prevalence of upper extremity conditions was found to be similar to findings in previously published studies, however in our study participants reported less lower back pain (32–34). This may be attributed to the fact that the current study did not adjust for participant characteristics which may also influence the results such as age, gender, and years of work experience (e.g., students, trainees vs. experienced workers). Interestingly, in our study a greater reduction in symptoms was seen if they were present for less than 3 months. Studies which have earlier

reported a significant beneficial effect of physical therapy on occupational musculoskeletal disorders, did not report on the duration of the symptoms before the intervention (28, 29, 35, 36).

Although, patients were not randomized in our study, the results suggest that the in-hospital physiotherapy clinic significantly decreases the perceived symptoms, stimulates early return-to-work and reduces absenteeism. There are several possible explanations for the clinic's effectiveness, with the exercise program offered at the workplace, employee management motivation and trained personnel's ability to treat minor ailments before they progress to chronic and more serious conditions, as the most advantageous factors determining the effectiveness of the training program.

The musculoskeletal symptoms have a multifactorial nature and we focused on the behavioral changes of the healthcare workers by introducing physiotherapy and exercises. In line with previous research, the individual approach led to a reduction of symptoms, however for a complete treatment of the pathologies a multifactorial approach to the symptoms is required integrating physical, demographic, work organization and work environment factors.

Despite the fact that no cost-effective analysis was performed in our study, we hypothesize that an in-hospital physiotherapy clinic will also result in reduction of healthcare costs. Musculoskeletal disorders are common among healthcare professionals and often lead to excessive and unnecessary referrals. We assume that if the information and treatment from a physiotherapist at an in-hospital clinic fulfills many of the patient's needs, this could reduce the number of patients acquiring continued referrals eventually leading to a reduction in medical costs.

Several important study limitations are worth noting. First, our patients were not randomized into control and intervention groups, but freely chose to participate. Second, to maintain anonymity, our analyses were made at the cohort level rather than the individual level. Lastly, our study was performed at a single institution; therefore, the results may not be generalizable.

5 Conclusion

This study attempted to determine the effect of an in-hospital physiotherapy clinic "CollegaPoli" focused on changing individual working behavior on the perceived severity of musculoskeletal symptoms. We also aimed to analyze the readiness to return to work among healthcare professionals after the physiotherapy sessions. Our findings highlight the effectiveness of an in-hospital physiotherapy clinic for healthcare professionals with musculoskeletal conditions. Our results report an overwhelming positive effect on employees and employers by significantly improving symptoms leading to quicker return to work in the healthcare workers. "CollegaPoli" is now a regular in-hospital clinic for healthcare professionals with musculoskeletal pathology, and it is rising in popularity. Future studies are needed to determine cost-effectiveness of an in-hospital clinic for healthcare professionals.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of the Flevo Hospital (FZ 23/33). Written informed consent was obtained from all patients and anonymity was strictly observed. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SG: Conceptualization, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. VV: Data curation, Validation, Writing – review & editing. RT: Formal Analysis, Software, Writing – review & editing. RK: Writing – review & editing. NG: Funding

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acquisition, Project administration, Resources, Visualization, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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