



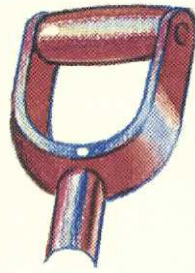
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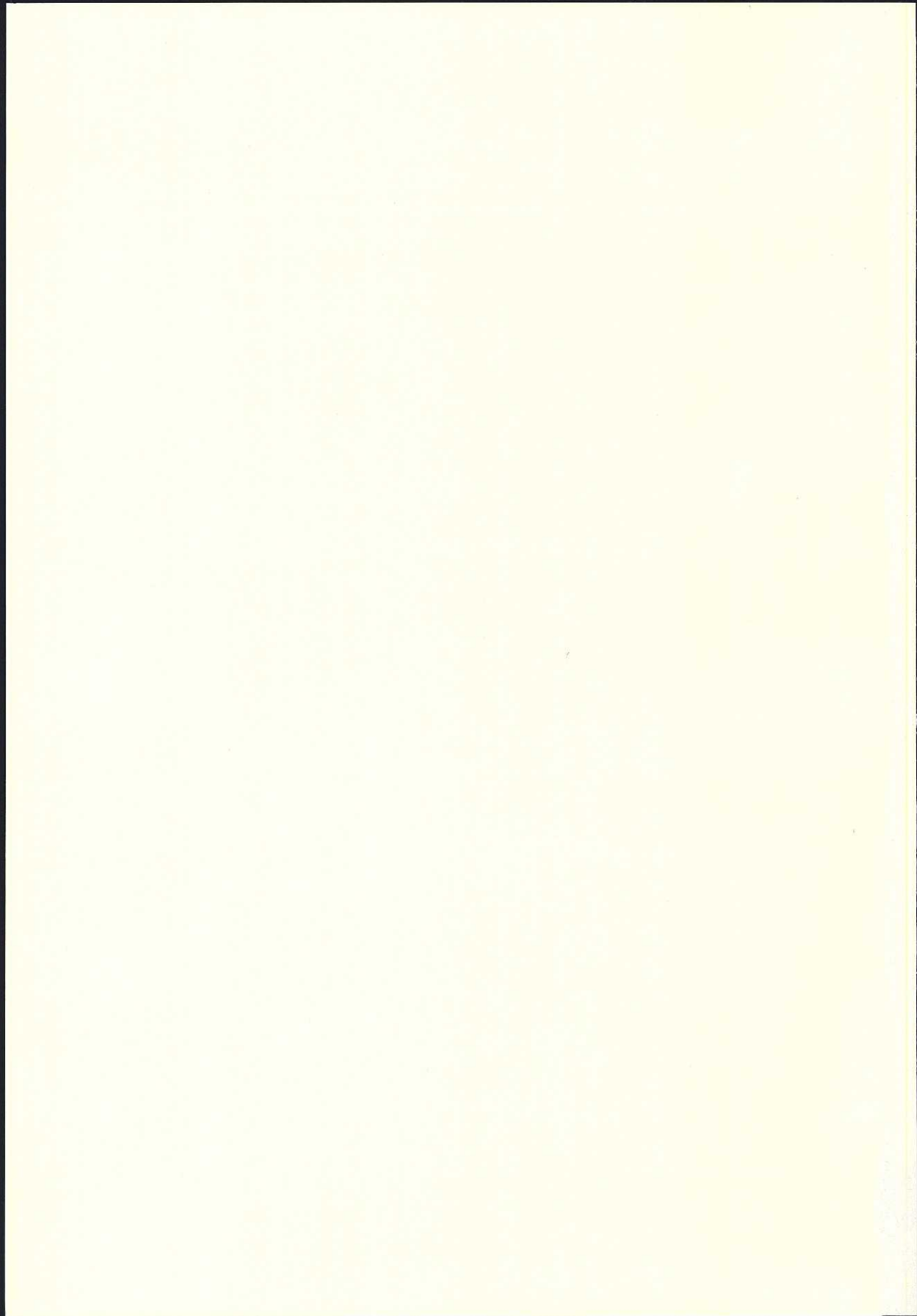
Co-financed collaboration between welfare services

*-Effects on staff and patients
with musculoskeletal disorders*



Göteborg
2005

Eva-Lisa
Hultberg



Co-financed collaboration between welfare services
-Effects on staff and patients with musculoskeletal disorders

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Eva-Lisa Hultberg
leg arbetsterapeut

Fakultetsopponent
Professor Staffan Marklund

Arbetslivsinstitutet, Karolinska Institutet, Stockholm

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Co-financed collaboration between welfare services -Effects on staff and patients with musculoskeletal disorders. Eva-Lisa Hultberg, Department of Social Medicine, The Sahlgrenska Academy at Göteborg University, Arvid Wallgrens Backe Hus 7, 405 30 Göteborg, Sweden

Background: The number of individuals in need of help and support simultaneously from different welfare services has increased. Collaboration between professionals and authorities has been seen as a way to improve the efficiency in treatment and rehabilitation. In Sweden, a trial legislation called SOCSAM was introduced in 1994 with an aim to improve collaboration and decrease costs for society through allowing co-financing and joint political steering across welfare services.

Aim: The main aim of this thesis was to assess if co-financed collaboration between primary health care, the social (sickness) insurance offices and social services contributed to improved care and rehabilitation for people with musculoskeletal disorders.

Methods: This research project assessed the effects of a natural experiment. Patients with musculoskeletal disorders attending three health centres with co-financed collaboration (DELTA health centres) were compared to similar patients attending four control health centres not practicing collaboration under the trial legislation. One hundred thirty eight patients were followed prospectively for one year. Information about health status, health care contacts and sick leave were collected through patients' interviews, through medical records, through the Swedish Social Insurance Registry, and through patient diaries. The project also involved a comparative qualitative study on staff-perceptions of the collaborative structure in DELTA and control health centres.

Results: Staff in both DELTA and control health centres reported fairly well functioning internal collaboration, but only staff at DELTA health centres reported well-functioning collaboration with social insurance offices. There were no major differences in baseline characteristics between the two patient groups. No significant differences between patients in the DELTA centres and the controls concerning change in health status between baseline and 12 months follow-up were found. Mean number of sick leave days during the 12-months period after inclusion was 94 for the DELTA patients and 87 for controls. At 12 months follow up, 31% in the DELTA group and 32% in the control group were on sick leave. Patients in the DELTA health centres had more contacts with physiotherapists than the controls, especially during the first months after inclusion. Contacts with social insurance office, social services or hospital did not differ significantly between the groups. The type of treatment the patient received only differed slightly between the groups.

Conclusion: Staff involved in the co-financed collaboration under SOCSAM perceived that the model was important for the collaborative process and that it had stimulated new interdisciplinary team structures. However, the follow-up studies of patients indicated that there were no major differences in the care and rehabilitation approaches, or treatments received, between DELTA and control patients. The only clear difference was that DELTA patients received more physiotherapy than controls. There is a weak evidence base for the type of treatments that was received by patients in both groups, which may explain why no significant differences were observed concerning health outcome or sick leave. The studies had some methodological limitations. Since the sample size was small and an observational design was used, the data should be interpreted with caution. Results may not be generalisable beyond rehabilitation of people with musculoskeletal disorders. This research contributes a small part only of the data required to judge the overall effects of co-financed collaboration under SOCSAM.

Key words: co-financing, collaboration, musculoskeletal disorders, interprofessional, primary health care, rehabilitation.

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From the Department of Social Medicine,
The Sahlgrenska Academy at Göteborg University,
Sweden

Co-financed collaboration between welfare
services

– Effects on staff and patients with muscu-
loskeletal disorders



by

Eva-Lisa Hultberg

Göteborg 2005

Eva-Lisa Hultberg, 2005

Department of Social Medicine

The Sahlgrenska Academy, Göteborg University

Arvid Wallgrens Backe 7

405 30 Göteborg

eva-lisa.hultberg@socmed.gu.se

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To my loving children

Ulf, Anna and Elin

ABSTRACT

Background: The number of individuals in need of help and support simultaneously from different welfare services has increased. Collaboration between professionals and authorities has been seen as a way to improve the efficiency in treatment and rehabilitation. In Sweden, a trial legislation called SOCSAM was introduced in 1994 with an aim to improve collaboration and decrease costs for society through allowing co-financing and joint political steering across welfare services.

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Svensk sammanfattning

Bakgrund: Försökslagstiftningen SOCSAM introducerades 1994, med målsättningen att skapa en effektivare rehabilitering och förkorta vård- och rehabiliteringsprocessen. Syftet var också att minska tiden av offentlig försörjning och förebygga långa perioder av ekonomiskt stöd. SOCSAM möjliggjorde samfinansiering och gemensam politisk styrning av samverksprojekt mellan primärvården, försäkringskassan och socialtjänsten.

Syfte: Det övergripande syftet var att bedöma om samverkan under samfinansiering och gemensam politisk styrning utifrån SOCSAM lagstiftningen leder till ett förbättrat omhändertagande och rehabilitering av personer med muskuloskeletal besvär.

Metod: Forskningsprojektet analyserade effekterna av ett naturligt experiment. Patienter med muskuloskeletal besvär som sökte vård på tre vårdcentraler (DELTA vårdcentraler) som arbetade enligt samfinansieringsmodellen jämfördes med liknande patienter som sökte på fyra vårdcentraler som arbetade traditionellt. Etthundratrettioåtta patienter följdes prospektivt under ett år. Information om hälsostatus, vårdkontakter och sjukskrivning samlades in genom patientintervjuer vid inklusionstillfället samt efter 6 och tolv månader. Dessutom inhämtades information från patientjournaler, försäkringskassans register samt genom patientdagböcker. I projektet ingick också en jämförande kvalitativ studie om personalens upplevelse av samverkans struktur och den interdisciplinära processen inom DELTA vårdcentraler och kontroll vårdcentraler.

Resultat: Personalen i båda grupperna upplevde att samverkan fungerade bra inom den egna verksamheten medan endast personalen på DELTA upplevde att samverkan med försäkringskassan fungerade bra. Det var inga stora skillnader i baslinje profil initialt mellan grupperna. Resultaten visade inte på någon signifikant skillnad mellan vårdcentraler med samfinansieringsmodellen och kontroll vårdcentraler avseende förändrat hälsostatus mellan baslinje och 12 månaders uppföljning. Det genomsnittliga antalet sjukskrivningsdagar under 12 månader efter inklusion i studien var 94 dagar för DELTA patienter och 87 dagar för kontrollerna. Vid 12 månaders uppföljning var 31% av DELTA patienterna och 32% av kontroll patienterna sjukskrivna. Patienter på DELTA vårdcentraler hade fler kontakter med sjukgymnast än kontrollerna. Åttio tre procent av DELTA patienterna och 39% av kontrollerna fick sjukgymnastik. Det var inga signifikanta skillnader mellan grupperna avseende kontakter med andra myndigheter eller sjukhus. Resultaten visade endast på små skillnader mellan grupperna avseende typ av behandling som patienterna fått.

Diskussion: Personalen på vårdcentraler med samfinansieringsmodellen upplevde att modellen var viktig för samverkansprocessen och att den hade stimulerat till nya interdisciplinära team strukturer. I studierna av patienter fanns dock inte några belägg för att samfinansieringsmodellen lett till bättre hälsa eller minskad sjukskrivning hos patienter med muskuloskeletal besvär jämfört med kontroller. Studien visade inte heller några skillnader mellan grupperna avseende vilken typ av behandling och rehabilitering patienterna hade fått. Istället gavs liknande behandling och rehabilitering både på DELTA och på kontroll vårdcentraler men patienterna på DELTA vårdcentraler fick fler behandlingar, i synnerhet mer sjukgymnastik. Studierna har några metodologiska begränsningar. Eftersom antalet patienter var litet och en observationsstudiedesign användes skall resultaten tolkas med viss försiktighet. Resultatet skall inte heller generaliseras till alla andra målgrupper för SOCSAM och DELTA. Denna avhandling bidrar endast med en liten del av de analyser som behövs för att bedöma effekterna av samfinansierad samverkan enligt SOCSAM.

ORIGINAL PAPERS

The thesis is based on the following papers:

- I Hultberg E-L, Lönnroth K and Allebeck P. Evaluation of the effect of co-financing on collaboration between health care, social services and social insurance in Sweden. *International Journal of Integrated Care* – vol 2, October 2002. www.ijic.org.
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- IV Hultberg E-L, Lönnroth K, Allebeck P and Hensing G. Effects of co-financed interdisciplinary teamwork on sick leave for people with musculoskeletal disorders. *Work* (accepted).
- V Hultberg E-L, Allebeck P and Lönnroth K. Effects of a co-financed interdisciplinary collaboration model in primary health care on service utilisation among patients with musculoskeletal disorders. (submitted).

The papers will be referred to by their roman numerals: I-V.

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INTRODUCTION

The number of individuals in need for help and support simultaneously from different welfare services has increased for many European countries during the past 10 years. Demographic and socio-economic changes in the society have also increased the complexity of the problems that health and welfare services have to tackle. For example, many illnesses, whether physical or mental, have substantial social components as causes, or consequences, or both. Growing numbers of patients/clients are therefore likely to need help and support from a number of different health and social services, either simultaneously or sequentially [98]. A typical example of a disease group that requires services from several authorities, providers and professions are patients' with musculoskeletal disorders, with its complex web of somatic as well as social causal factors and often longstanding problems [88]. It is also an example of a disease group that causes increasing costs for society, especially due to high levels of sick leave [55,88,120].

Collaboration between professionals and authorities is seen as a way to improve the efficiency in addressing complex problems such as the prevention, diagnosis, treatment and rehabilitation of conditions such as musculoskeletal disorders [98,100]. There is an underlying assumption that improved collaboration leads to more efficient use of resources and thus reduces direct and indirect costs for society [38,44,112,113]. This might be the most important reason for the increased attention among politicians to provide for closer collaboration between authorities.

In Sweden, most health and social service organisations are government owned. However, differences in funding streams, political steering, priorities, organisational structures and professional cultures are barriers for collaboration. Therefore, strategies for improved collaboration need to consider mechanisms to link or integrate public funding and promote coordinated political steering between authorities as well as to bridge professional boundaries and cultures between different health and social services.

In 1994, a trial legislation called "SOCSAM" came into force. SOCSAM aimed to improve welfare for individuals with multiple needs as well as to decrease the costs for society [83]. SOCSAM made co-financing and joint political steering possible across primary health care, social (sickness) insurance and social services. The trial legislation has been tested in eight different geographical areas since mid 1990s. One of these areas is located in Göteborg, and this trial project is called DELTA.

This thesis assesses processes and outcomes of one areas of collaboration under SOCSAM, in a part of the DELTA project. The research project focuses

on collaboration in primary health care settings and uses musculoskeletal disorders as tracer conditions. The thesis aims to contribute empiric data on processes and outcomes of collaboration in care and rehabilitation, which should be useful for future decision making and planning of collaboration in the field of health and social services in general and collaboration under SOCSAM in particular. However, it does not claim that the findings presented are representative of all activities under DELTA or SOCSAM.

To analyse the effects of the legislation concerning organisational changes, working methods, treatment approaches and patients' health outcomes, Donabedian's approach for analysis of "structure, process and outcome" was used [27]. The "structure" concerns the SOCSAM collaboration model, the "process" staffs' working methods and the "outcome" the patients' health status.

In the following background section, the patient group in focus - people with musculoskeletal disorders - is first described. This part includes the epidemiology of the disorder, its' impact on society and available evidence-based interventions for this group of patients. Then, different authorities' and service providers' roles and responsibilities towards this patient group are discussed while factors that might impact negatively on their collaboration are outlined. Next, opportunities for improving collaboration within and between these authorities are discussed. Finally, the SOCSAM legislation and its application in the DELTA project are described.

1 BACKGROUND

1.1 Musculoskeletal disorders

1.1.1 Epidemiology

Musculoskeletal disorders include about 200 conditions affecting joints, bones, soft tissues and muscles. Many of them cause important burden in pain and sometimes crippling disability. Consequently, large costs of health care and lost productivity are associated with musculoskeletal disorders [127]. Musculoskeletal disorders are the second most common reason, after infectious diseases, for primary care visits in most western countries [62,109,116]. In the “Yearbook of health and medical care 2002” musculoskeletal diseases are identified as the most common illnesses in Sweden, followed by diseases in the circulatory organs and mental illness [111]. Back pain is also the most expensive single diagnosis and accounts for 11 per cent of the sick leave costs. Nachemson and Jonsson estimated in an international review a point prevalence of 15 to 30 per cent, and 1-month prevalence between 19 to 43 per cent and a lifetime prevalence of about 60 to 70 per cent. In Scandinavia the point prevalence is around 30 per cent and the lifetime prevalence about 80 per cent [88]. That means that a substantial number of people will experience low back pain sometimes in their lives [23,78]. In Sweden, 80 % of the inhabitants experience back problem at some time in life and about 50 % experience neck and shoulder pain [88]. Back problem are the most common cause of chronic sickness in Sweden in both men and women less than 64 years of age and the second most common between age 65 and 74 years. There is a slight increase over time of back pain in the general population of Sweden [99].

Generally, it seems like men suffer more from low back pain and women more from neck and shoulder disorders [95], although there are some contradictory opinions [78]. Most patients recover from back pain without further problem [1] and only a minority of patients get musculoskeletal pain with functional disability for longer periods.

The origin of pain and disorders of neck and back is complex and their causes are multifactorial. Depression has for example been found to be a risk factor for the onset of an episode of troublesome neck and low back pain [17]. Research also show that psychological as well as psychosocial factors complicate the treatment of patients with back pain [18]. A person with both back pain and depression use twice the sick leave days and incur twice the health care costs compared to those with either problem separately [30].

Many studies have examined low back pain with an aim to describe influences of individual factors, work-related factors and psychosocial factors. It

has been shown that the risk for a further episode of neck and back pain substantially increases if a person has a history of musculoskeletal symptoms [93]. In addition, many potentially causal factors related to the workplace have been discussed, from heavy work to psychosocial strain. Studies on the association between low back pain and occupational risk factors are often hampered by the difficulties of measuring exposure to specific factors. However, an association has been found between sick leave due to low back pain and frequent bending and twisting of the trunk, frequent heavy lifting, and different aspects of psychosocial conditions including poor job satisfaction [55,88]. Repetitive work tasks seem also associated with both acute and chronic neck complaints [88]. Most episodes of neck pain in the general population are associated with psychological distress, poor self-perceived general health and previous history of pain [21]. Evidence also suggest that psychosocial factors impact on the transition from acute to chronic low back pain and disability [80], and are important for how the development of neck and back disorders will proceed [88].

Psychosocial factors are an integral part of the pain-disability process including emotional, cognitive, and behavioural aspects. Nachemson et al states that: "it may be hypothesized that the key social influences lie in the area of individual, group and society in general's attitudes and beliefs about work, about back pain and its relationship to work, about sickness absence, about welfare benefits and about retirement" (p48) [88].

In summary, there are associations between a number of psychosocial factors and the occurrence, consequences, experiences and prognosis of musculoskeletal disorders, in particular back and neck problems.

1.1.2 Societal costs of musculoskeletal disorders

Musculoskeletal disorders cause considerable suffering and disability for individuals. Furthermore, it is a burden for society through reducing productivity, through requiring considerable resources from the health and social services, and through causing high costs for the social (sickness) insurance system. Musculoskeletal disorders are the major cause for sick leave in Europe. Sweden, Norway and the Netherlands have the highest frequencies of sick leave due to back- and neck- disorders [92]. The total estimated costs in 1995 for back and neck pain in the western countries corresponded to 1 - 2% of the gross national product (GNP). Only a small part, 10%, of the cost is directly health care related (e.g. staff, equipment and drug costs), while other segments of society has to bear 90% of the cost, i.e. the indirect costs that include income transfer costs and loss of productivity [88].

In Sweden, the sick leave rate increased with 57% (274 400 persons) between 1997 and 2002. The costs for sick leave and disability pension corresponded to 3.7 per cent of the Swedish GDP in 2002 (National Social Insurance Board, RFV 2002). The three most common causes of long term sick leave and disability pension in Sweden are musculoskeletal, psychological and circulatory diseases [3]. One third of the total costs for sick leave come from musculoskeletal disorders (National Social Insurance Board, RFV Budget 2001). Indirect costs such as sick leave and disability pension represent the largest part of the societal cost of back and neck disorders [54].

Some factors particular for the Swedish society have considerable impact on the sick leave costs. There are a large number of persons working after 60 years of age compared to other countries such as England, Germany, Norway and France. The social insurance regulations do not restrict the length of time that a person can receive sick leave beneficial. Studies have also shown that the design of the social security system influences the sick leave level, for example the number of waiting days a person have before being eligible for sick pay and the level of allowances [3]. In Sweden one waiting day was used and the level of the allowance was 80% of the salary (up to a maximum salary of 38.000) in the year of 2000.

1.1.3 Effectiveness of rehabilitation interventions for musculoskeletal disorders

“Musculoskeletal disorder” is a wide definition of a number of different diseases and problems. The wide and vague definition sometimes complicates the rehabilitation of this group of patients. To be able to evaluate treatments and rehabilitation programs, the musculoskeletal disorder under study should ideally be narrowly defined. Most research therefore concerns the musculoskeletal disorders that are least difficult to define and classify, such as low back pain and neck pain. Since the scientific knowledge is still limited concerning association between the physical, psychological and psychosocial factors and risk of developing musculoskeletal disorders, it is difficult to develop effective interventions. The fact that there are few evidenced-based methods to treat back and neck disorders, especially chronic ones, makes care and rehabilitation for this group of patients troublesome [56,68].

During the last years, new programs have been developed aiming to make patients with back disorders regain their work ability. So far, there is no consistent evidence that specific treatments such as exercise therapy and acupuncture, [114,121,123] or multidisciplinary rehabilitation programs improve health status in patient with disorders such as neck- and shoulder pain, and fibromyalgia [68-69]. Studies conducted on patients with low back disorders show that ordinary activities help patients

recover and restore function and work capacity as effectively as special interventions [3,51,63,82]. Similarly, dynamic muscle training and relaxation training do not seem to improve neck pain more than ordinary activity [125].

Psychosocial factors seem to have as much impact on disability as biomedical variables and should therefore be included in comprehensive assessments and treatment routines for patients with neck and back pain [88]. Some evidence suggest that patients with chronic low back pain can be effectively rehabilitated with multidisciplinary bio-psycho-social rehabilitation programs [50,89]. The key elements in these programs are the combined physical, psychological and social/occupational interventions [119,120]. Thus, these interventions require staff from different disciplines and authorities [87]. In addition, it is important that professionals are interested in working in interdisciplinary teams to be able to improve collaboration.

Sick leave due to a musculoskeletal disorder is seldom linked to a patoanatomical diagnosis [11,22]. However, high physical workload, bended and twisted work position and low work satisfaction are factors that influence sick leave. Also, presence of a specific back diagnosis and earlier sick leave due to back disorders seem to increase the risk for short- and long term sick leave [3].

Several studies have been carried out to assess effects on sick leave of different kinds of interventions such as physical activity [84,91], workplace health promotion [10] and increased self certified sick leave [97]. There is no strong evidence that such approaches reduce sick leave, partly because methodological problems often make it difficult to draw conclusions about a causal relationship between the intervention and reduced sick leave [3]. However, a recent review by Schonstein et al suggested that physical conditioning programs that include a cognitive-behavioural approach plus intensive physical training seems to reduce the number of sick leave days in workers with sub-acute or chronic back pain [102].

Primary prevention programs are an alternative to reducing occurrence of musculoskeletal disorders and thereby their negative consequences for individuals and society. The idea is to use less recourse at an early point to prevent the development of unnecessary suffering and related costs later. There is lack of evidence of impact of preventive interventions. There are, however, some studies showing that lumbar support or back schools are not effective in preventing neck and back pain. There is also consistent evidence that exercise may be effective in preventing neck and back pain. [88].

In summary, there is a lack of evidence-based methods for improving health status, reduce sick leave and increase work resumptions in patient with musculoskeletal disorders. However, multidisciplinary bio-psycho-social rehabilitation programs that require multi-professional collaboration have been shown to provide some positive results for this group of patients.

1.2 The Swedish welfare system in brief

The Swedish model of government administration has three levels: national, regional and local. At the *national level*, the Riksdag (Swedish parliament) has legislative power. Proposals for new laws are presented by the Government, which also implements decisions taken by the Riksdag. The Government is assisted in its work by the Government Offices, an integral authority comprising the Prime Ministers Office, the ministries, the Permanent Representation of Sweden to the European Union and the Office of Administrative Affairs.

Within the Government Offices, there are nine ministries. In particular, two ministries concern the SOCSAM trial legislation. First, the Ministry of Health and Social Affairs, which is responsible for peoples' financial security, social services, health and medical care, public health and the rights of children and persons with disabilities. Second, the Ministry of Industry, Employment and Communication Matters, which is responsible for employment offices, implementation of labour market policies, adaptation of work and rehabilitation focusing on working life, as well as disability and unemployment benefits.

At the *regional level*, Sweden is divided into 21 counties. The county councils are directly elected by the people. At the *local level*, Sweden has 290 municipalities. Each municipality has an elected assembly, the municipal council, which takes decisions on municipality matters.

Some of the authorities and organisations important for care and rehabilitation of people with musculoskeletal disorders are briefly described below.

1.2.1 Health care

The financing and organisation of health care services is the responsibility of the 21 county councils. The county councils receive funding from the government and from local income tax, and about 5% from user charges. Most hospitals and other health care facilities are operated and owned by the county councils, which in principle have total responsibility for the delivery of health services [7].

1.2.2 Social (sickness) insurance

The National Social Insurance Board supervises 21 social insurance regional offices. Each office is a self-governed legal public unit with a political board. The twenty-one regional social insurance offices are responsible to provide financial security for those who are ill, the disabled, parents and pensioners. Local offices, at least one in each municipality, are responsible for contact with the public. In January 2005, this organisation changed and a new authority was introduced called the Insurance Office. That new authority replaced the National Social Insurance Board and the regional offices are no longer sovereign.

The National Insurance Act insures all Swedish and foreign nationals domiciled in Sweden. Every person with an income of 9 200 SEK per year or more is insured for sick leave cash beneficial. The beneficial is paid to persons who suffer from a disease or injury that hinders a person to do his/her work. In this context the definition of *disease* is "every abnormal somatic or mental state that does not belong to the normal process of life". During the period of this research project the sick leave benefits for the first 14 days were paid by the employer and were not included in the social legislation. To receive sickness benefits for more than 7 days a physician must issue a sick leave certificate. The first day is a qualifying day that is not compensated.

1.2.3 Social services

The financing and organising of the social services is the responsibility of the 290 municipalities. For this, the municipalities receive funding from the government and from local income tax. Everyone who lives in Sweden should confidently be able to turn to the Social Services in their home municipality for support and assistance and should be guaranteed a reasonable standard of living under the Social Services Act. The basis for the provisions of the Social Services Act is that all citizens are of equal value and have the same right to social and financial security, care and assistance. In Sweden, the Social Services Act contains regulations regarding rights to financial and social assistance, and regarding the municipal authorities' duties towards residents of the municipality. This includes financial support to a level that is adjusted every year, access to counselling in case of family problems, housing assistance, substance abuse rehabilitation, etc.

1.2.4 The national labour market board

The National Labour Market Board (Arbetsmarknadsstyrelsen) is responsible for the implementation of the labour market policies. Their overall aim is to manage, co-ordinate and develop the labour-market policy organisation. They should also develop aims and routines for the local County Labour Board and allocate economic and other resources. The National Labour Market Board is also responsible for evaluating the national labour market policies. The local labour offices help matching employers and employees. Unemployed persons should receive assistance with improving employment possibilities, including vocational training. The employability institute (Arbetsmarknadsinstitutet) offer unemployed persons with reduced work capacity vocational rehabilitation.

1.3 The need to collaborate in treatment, rehabilitation, care and support for people with musculoskeletal disorders

All four above authorities are of importance to improve welfare services for persons with musculoskeletal disorders:

Health care: The health care service has a central role since it provides the main competence for diagnosis, treatment and rehabilitation. In addition, medical doctors are responsible for writing sick leave certificates for social insurance and sometime for social welfare and employment offices (see below). Patients with musculoskeletal disorders often need assessments from several professionals within primary health care, such as physicians, physiotherapists, occupational therapists, social workers and psychologists. For example, the physiotherapist will make physical examination to determine the functional ability and physical conditions and provide suitable treatment. The occupational therapists assess the ability to perform daily activities at home and work and plan for treatment including a work place visit. Psychologists and (medical) social workers provide therapy and counselling for patients with a psychosocial component of the musculoskeletal disorders. The (medical) social worker also assists with economic and social support.

Social (sickness) insurance: The social insurance organisation provides economic compensation when a person with musculoskeletal disorders cannot work due to a disease. It organizes medical assessment and rehabilitation for a few selected complex cases in special facilities owned by the social insurance. However, normally the social insurance organisation is dependent on medical doctors and other health care staff employed outside the social insurance for diagnosis for assessment of disability and for rehabilitation.

County employment board: The county employment board has a responsibility to help unemployed finding a job and help to find employment that is more suitable for a person with a disability. The local employment office might therefore need to coordinate with health care providers as well as with social services and social insurance. If a person is entitled to unemployment benefits, the employment office coordinates these payments. If an unemployed person with musculoskeletal disorders is disabled to the extent that he or she could not start any potential job available on the job-market, he or she is entitled to sick leave cash benefits, provided that he or she is covered by the sickness insurance. The judgement of appropriate source of compensation in such a situation is often complicated and requires coordination between employment office, social insurance and health care.

Social service: The social service needs to coordinate with health care services concerning people with musculoskeletal disorders who are too sick to work and who are not covered by the sickness insurance and therefore need social welfare benefits. Another situation is if the medical condition of their client is interfering with activities that are carried out as part of their support services, e.g. if a client cannot take part in a training course or attend a specific activity upon which their social welfare benefit is conditioned. In such situations, the client has to obtain a certificate from a medical doctor. Other situations when there is need for coordination are for example when a musculoskeletal disorder is part of a complex mix of socio-medical problems, for example including substance abuse and relational problems in the family.

1.4 What are the barriers for collaboration?

1.4.1 Barriers between authorities

In Sweden, most health care institutions and personnel are directly connected to public sector agencies. This means a potential for direct coordination and integration of health related services. Successful medical rehabilitation within the primary care relieves financial burdens of social insurance system and social welfare systems. Successful social support potentially relieves part of the burdens of primary care and social insurance offices. Yet, collaboration is often weak, interventions are often fragmented and split between different organisations and political bodies [83]. This fragmentation exists both within the public health care organisation and between health care and other public sector agencies. This situation often leads to a collaboration in which each authority contributes with staff time for each specific activity without a long-term strategy for integrated and multidisciplinary collaboration between authorities.

Each of above players has its own set of rules and regulations to follow. They share an overarching philosophy to provide optimal support to the individual and much of their areas of responsibility are overlapping. However, collaboration is often hindered by lack of shared specific objectives and joint responsibility [58]. A major area of potential conflict and tension between these organisations is the area of financial compensation and support for clients and patients. A delay in surgery for a person can for example increase the length of a sick leave period. The health care providers do not have any responsibility for financial compensation and are therefore not directly concerned with this issue. However, they are indirectly heavily involved since their decision-making affects what type of financial support or compensation the individual will receive: sickness cash benefit, unemployment benefit or social welfare benefit. This is of importance for the individual patient since the compensation level can vary greatly. It is also important to the different authorities since they have separate budgets.

A related area of potential tension is the definition of illness, disease and disability. The physician determines the eligibility for sick leave and other compensations based on the diagnosis, and an assessment of degree of disability, work-ability and prognosis. Furthermore, the patient can only receive sick leave beneficial if a disease or injury leads to work inability in relation to the demands of that persons work. Musculoskeletal disorder can seldom be diagnosed by objective tests. Often, the diagnosis will be based on symptoms reported by the patient and therefore the discussion with the patient are very important for the physicians decision-making [115]. Since the diagnosis is essential for the evaluations and judgements concerning financial compensation, support and rehabilitation also by representatives of social insurance, labour office and social services, there is risk of conflict between authorities concerning how to interpret patients' symptoms and reported problems [31,40].

It is thus important that authorities coordinate with each other and use common definitions and judgement criteria. Ideally, assessment of musculoskeletal disorders need to incorporate a range of medical and social factors including clinical findings, reported symptoms, workplace demands, perceived severity of illness, social and psychological aspects, and status with regards to sickness insurance, unemployment benefits and/or social welfare benefits. A full investigation should therefore ideally be based on information from a range of sources including the patient, different health care professionals, workplace assessments, and assessments made by representative of social insurance and employment offices.

The different players are dependent on each other in order to fulfil their obligations towards their clients. The social insurance employment office

and social service staffs usually lack medical training. Physicians often lack training in judging consequences of illnesses for ability to perform certain work-related tasks. Despite the need for co-ordination, the dialogue between the different players is generally limited to brief formal written documentation, which is often insufficient. This sometimes lead to a delay in rehabilitation, sub-optimal judgements, misunderstandings and sometimes conflicts between health sector and social insurance sector [117].

In the best interest of the client, there is a need for joint planning. One barrier for instituting such collaborative approach is that there is separate funding and separate political steering for the different welfare sectors [110]. The authorities may have different views on short and long-term goals. This may be more or less transparent. The goals may be conflicting within and between organisations. For example, there may be goals to decrease payment in a benefit schemes in order to keep a tight budget, while the overarching goal to provide support according to clients needs and rights remain. One authority may therefore try to push financial burdens onto others by arguing that a client is not eligible for their support, but matches the criteria for another benefit scheme. This leads to a risk that individual that are difficult to classify into as precise target group for one single authority, especially those that require substantial support, circulate eternally in the system without anyone taking responsibility – by the insiders sometimes referred to as the “Old Maid Game”. Many patients, including those with musculoskeletal disorders may therefore “fall between two stools” of the different welfare systems and be denied the support they are entitled to.

1.4.2 Barriers between professions

To create and implement new ways to collaborate can be difficult. Different professionals have different competences and responsibility areas. The different competence and responsibility areas could be seen as complementary within an organisation. However, the different professions often lack detailed knowledge about each other’s competences. For example, physicians often perceive that lack of knowledge and understanding about medical matters among social insurance officers is an obstacle for improved collaboration between health care and social insurance [31]. This could be prevented by closer collaboration between different professions in practical work [31].

Poor information exchanges between authorities concerning clients also affect the collaboration negatively [40]. The cultural environment within an authority/organisation develops when staff works together. Different authorities/organisations such as social security, county councils, and the municipalities’ have developed different work cultures, which may influence nature and quality of communication and collaboration between organisa-

tions [58]. The differences may become clear when social legislation and medical practice need to be harmonised within practical teamwork.

Another factor of importance for the inter-professional collaboration is the geographical distance between the involved professionals and authorities. There might be a need for personnel to actually meet each other regularly, share information and see patients together in order to improve collaboration [104]. Research show that co-location of a social worker in a primary health centre was one factor that seemed to improve the relations between primary health care and social services [19,46].

Research from the 1970s and 1980s indicate that collaboration models have been slow to develop. Halstead (1976) and Schmitt (1988/2001) published critical reviews of the outcome of interprofessional team care [52,100,101]. They found that outcomes have been positively affected by the interprofessional team approach. However, both authors emphasize that methodological and conceptual limitations in the studies reduce the confidence in attributing positive outcomes as team/collaboration effects. In general, studies on collaboration have concerned teamwork on patients at hospital while there is still a lack of studies conducted in the primary health care.

There is a general assumption that collaboration between professionals results in more effective care than non-collaborative approaches [100]. Thus, inter-professional collaboration is now a well established component of health care organisations [46,60,61,98,100]. Several studies show that health care staff are positive to work in interdisciplinary teams [24,46,61,96], although the opinion differ regarding how productive interprofessional collaboration really is [79]. There is still little scientific evidence that integrated care and teamwork results in increased effectiveness and efficiency [20,57,65,72,100].

Research conducted on collaboration often focuses on the staffs' perspective only, while lacking information about patient outcome [100]. A review done by Dowling et. al. as late as 2004 showed that research in England still focus on the collaborative process and not on patient outcomes and that any scientific evidence for positive effects of collaboration is poor [29]. There are however studies, in primary health care, showing positive outcome on patients as an effect of interdisciplinary team work [103,105]. There have also been experiments on an organisational level aiming at elderly and their access to medical services that points to a need for structured organisation and joint political stewardship besides the work to improve interdisciplinary teamwork on the micro and/or patient-level [45,60].

1.4.3 Team development

The concept “team” has been defined in many different ways. Two common definitions are: an organizational group composed of members who are independent, share common goals and coordinate their activities to accomplish these goals [90] or “a team is a small number of people with complementary skills who are committed to a common purpose, performance goals and approach for which they hold themselves mutually accountable” (p 45) [70]. Both examples outline characteristics of the team that are important although they both fail to address how they can be achieved. Successful interdisciplinary teamwork is also difficult to achieve in practice although it is a well-accepted strategy [33].

Teamwork in primary health care has many potential benefits such as increased efficiency and effectiveness, skill enhancement, flexibility, improved support and possibly also improved patient care with stronger evidence based practice [2]. However, as discussed above, there are barriers such as different management structures, diverse objectives, professional culture and perceived inequalities in status. This limits the potential of interdisciplinary teamwork. Recognizing and understanding the key influences on teamwork is a crucial step for teams who wish to improve their performance.

In 1977, Tuckman & Jensen presented one of the most influential models of conceptualization of group development [118]. From a review of 70 studies, they abstracted a four-step team developmental model. The four steps are a) testing and dependency, or the “forming” stage, b) conflict, or the “storming” stage, c) cohesion and consensus, or the “norming” stage, and d) functional role relatedness, or the “performing” stage. Farrell et al. have argued that this conceptualization “is a descriptive summation rather than a causal theory” (p282) [35]. However, they conclude that it is necessary to consider Tuckman & Jensen’s findings to be able to move forward to a causal theory. Farrell et al. then presents an interdisciplinary team developmental model and show the team developmental process from early to later stages. In the early stages, the team face anomie, conflicts and uncertainty about their roles and the teams’ mission. At this stage, team members also often become anxious about participating in the team. The informal role differentiation in the early stages diminishes in later stages and the team members’ interpersonal behaviour becomes less differentiated on three dimensions: prominence, sociability and task-orientation. The more education the team members have the more task-oriented they become regardless to what stage of the team development they are. The authors conclude that, eventually, most teams develop a joint team culture but for that the team needs an adequate leadership, repeated review and evaluations of their experience of working together.

It can be hypothesized that co-financing and joint political stewardships could facilitate the process of increasing and improving collaboration between authorities and professionals and overcome above-mentioned barriers for effective teamwork through legitimising inter-professional teams.

1.5 Experiences with co-financing and joint political steering in Sweden

Joint assessments and treatment that includes both health and social care and assessments regarding financial beneficial should ideally not be hampered because the professionals belong to different authorities. One opportunity to facilitate interdisciplinary teams is to relax or shift the boundaries of responsibilities between authorities and thereby ensure patients "seamless" welfare services. Particular attention should however be paid to planning an appropriate mix of staff and skills in the health care organisation and to review the traditional definitions of medical roles in the interdisciplinary teamwork. To shift the boundaries of responsibilities between different professionals could mean that overqualified and expensive personnel devolve certain less clinically demanding tasks to more appropriate staff.

Such change may require joint political stewardship and financing. Changing authorities' responsibility such as pooling budgets and allowing joint political steering, need regulatory changes through political decisions. Several reforms that concerned closer collaboration between authorities were introduced in Sweden during the 1990s but the interest in and discussion about collaboration had been going on for decades. In 1988 a Swedish governmental commission emphasised the need for service providers to facilitate the collaboration between authorities and public organisations providing health and welfare services.

However, during the first half of the 1990s, the keyword in health care was competition, not collaboration. Attempts were made to introduce market mechanisms through "internal markets" under the assumption that this would improve efficiency. Eleven of the then 26 county councils split their purchasing and provider functions, each governed by a separate political board. Although the content of the purchaser-provider model differed between county councils, all were intended to offer freedom of choice for patients [9]. During the late 1990s, marketisation was also increased through promotion of private health care provision. However, the volume of health care provided by private providers grew only from a few per cent in 1990 to 9 % by 2002 [36].

At the same time, two major reforms (the ÄDEL Reform and the Mental Health Reform) were introduced, aiming to strengthen responsibilities

within the local municipality concerning old people and persons with mental illnesses. One aim was to facilitate collaboration between the municipalities and the county councils. When the ÄDEL Reform was introduced 1992 the municipalities became responsible not only for social services but also for nursing and for other non-medical health care provision. The mental health care reform implemented in 1995 specified the municipalities' responsibilities for housing, employment and care. Both reforms transferred responsibilities from the county councils to the municipalities to improve the quality of health care for older people and people with mental disorders, respectively [36]. The two reforms meant to recognize similar responsibilities in each of the authorities and locate them into one authority. There was no co-financing. Rather, the municipalities had to pay for certain services from the county councils, for example when social rather than medical care was provided for hospitalized elderly patients. An underlying assumption of the two reforms was that they would strengthen interdisciplinary collaboration between professionals from different authorities and different administrative levels. However, critics have pointed to continuing poor collaboration, both within the municipalities' and between municipalities and county councils [6].

Within a few years the government introduced three other reforms, "FINSAM", "FRISAM" and "SOCSAM", aiming to improve collaboration between welfare sectors but this time targeting the whole population. These three new reforms introduced new opportunities for different authorities to co-finance collaborative projects. FINSAM was introduced in 1993 with the aim to improve co-ordination between health services and sickness insurance and to give the sickness insurance system possibility to purchase certain health care services for selected patients in order to shorten sick leave for certain groups. Local collaboration projects were financed jointly by different authorities but without long-term co-financing agreements. New agreements between health care and social insurance was set up to share responsibilities for some parts of the social insurance fund. The authorities could use the sickness insurance funds through purchasing care needed for rehabilitation and thus invest resources in targeted health services. This was a way to reduce cost for sick leave. The evaluation of this reform suggested that the number of people on sick leave had decreased and that rehabilitation was more effective due to increased opportunities for early interventions [113,124].

The second reform, FRISAM, came into force in 1998 also aiming to promote financial coordination between health care services and sickness insurance. The reform made it possible for different authorities to set up financial agreements to reach a more effective use of available resources. Health care, social insurance, social services and county employment board were able to

make agreements to participate and financial contribute to collaboration activities. FRISAM is a permanent legislation with a framework for voluntary financial coordination. However, the evaluation suggested that the different authorities still did not give enough priority to collaboration and concluded that joint political and financial management, was also required in order to foster collaboration [38].

The main objective of these two reforms was to improve efficiency within and between different welfare sectors. No particular groups of service users were targeted. However, rising levels of absence from the labour market because of long-term sickness focused the attention on people on long-term sick leave. The number of sick-listed people increased by 57 per cent between 1997 and 2002, with costs amounting to 3.7 per cent of Swedish GDP in 2002 (National Social Insurance Board, RFV, 2002). The third experiment, SOCSAM, therefore came to mainly target persons on sick leave or at risk of being on sick leave, because of their risk of falling between the responsibilities of different agencies and services. Unemployed persons and persons on social welfare in need for help from different authorities to be able to return to work were also a targeted group within the reform.

1.6 The SOCSAM legislation

SOCSAM came into force in 1994, aiming at gaining welfare improvements for individuals, and decreasing the costs for society [83]. The trial legislation has been tested in eight different geographical areas since it started. SOCSAM allows sickness insurance, social services and health services to pool their budgets and jointly manage local rehabilitation services. Up to five per cent of the local social insurance and social welfare budgets, together with the same amount of resources from local health services, could normally be pooled. Each of the eight geographical areas ordinary budgets was used as a financial frame. Each project could then choose what part in the organisation they wanted to include. A joint political board oversees the use of these resources and is responsible for the strategy and management of the initiative.

There are some important differences between FRISAM and SOCSAM. In FRISAM, the collaboration between authorities is voluntarily. That is, two or more authorities can decide if they want to collaborate in any site and at any time. In the trial legislation SOCSAM, the areas interested in participating in the trial had to apply and be accepted to be able to participate. In SOCSAM there were eight trial areas and the participating authorities were co-financing the collaborative activities. There were also joint political boards. In FRISAM the collaboration between the authorities took place

with clear financial responsibilities but only voluntarily political participation.

The construction of the financial framework was similar in all trial areas for SOCSAM, although the proportions of the budget contributed by the different authorities varied. There were also differences between the trial areas in their application of the financial framework. In larger areas, full pooling of budgets between the different services were not envisioned and did not occur, since only certain specific collaborative projects were involved and the SOCSAM experiment was targeted primarily at people aged between 16-64 years. In smaller localities, the SOCSAM political board took over all the activities included in the three authorities' ordinary responsibilities, and services for people of all ages were involved.

The role of politicians on the joint political board differed from their normal responsibilities. They had wider responsibilities for deciding on the services and interventions to be provided for people who needed help from different authorities, but without the usual employee and management responsibilities. These responsibilities do not map neatly onto party political interests and the local boards tended to achieve consensus around the appropriate trial activities. A pooled budget enlarges the politicians' spheres of responsibility, from one service to a cluster of related services. In theory, this new way of working could make it possible to overcome the reluctance of one service or sector to collaborate and invest in new initiatives or interventions whose impact, in terms of reduced levels of need or demand for expenditure, is likely to fall elsewhere in the overall welfare system.

The trial legislation prescribed the task of the political board and the financial framework, but the local services involved were free to decide what activities should be included. The aim was to improve welfare for everyone, including older people and children, needing help from different professionals from different authorities. However, the primary target group for a majority of the SOCSAM trials became individuals at risk of, or already in receipt of, public benefits such as social assistance allowances, sickness benefit or unemployment benefit. Nevertheless, other local collaborative projects, surveys and educational activities were also prompted by the SOCSAM trials. Most of these involved just the local municipalities and county councils, but again tended to focus on projects intended to rehabilitate people so they could return to work. Some projects also involved the county labour boards, which entered into local inter-agency agreements. Their participation was not compulsory and they did not contribute to the pooled budget.

The government commissioned the National Social Insurance Board and the National Board of Health and Welfare to evaluate the trial legislation at a

national level and to co-ordinate the local evaluations that were conducted in the eight trial areas. The evaluation of SOCSAM involved both quantitative and qualitative methods. Interviews and questionnaire data, descriptive reports, data from patient/client registers and local evaluation reports from the eight trial areas were analysed. The design of the evaluations was similar across all eight trial areas and comparisons were also conducted between the SOCSAM trial areas and areas without the trial legislation, in order to detect differences.

The national evaluation was completed in 2001. The report concluded that SOCSAM allowed authorities to prioritize collaborative activities. However, there was only limited evidence that this collaboration led to reductions in social insurance expenditure on long-term sick clients. Moreover, any reduction in social insurance and social welfare spending may have been counter-balanced by the increased costs of operating the new, pooled budgets. Many of the experiments were directed at people receiving welfare payments and aimed to improve their health and thereby facilitate return to work. However, the evaluation was only able to identify some weak indirect evidence of impact of the SOCSAM experiments on patients' health status [112]. In 2003, the government proposed a permanent legislation based on the SOCSAM experiments. In the beginning of 2004, the trial legislation became permanent with an opportunity for health services, social services, sickness insurance and labour offices to collaborate through pooled budgets and joint political management.

1.7 The DELTA project

To reduce barriers between authorities caused by financial and/or different political objectives the primary health care, social insurance and social services in Hisingen, Göteborg, applied to the government to be included in the SOCSAM trial. The intention was to stimulate staff within the different organisations to find new ways for collaborative activities around services that produce health and welfare gains across welfare sector boundaries. The overall aim was to make care and rehabilitation more efficient and to shorten and improve the rehabilitation process [83,4].

The "DELTA" project started in 1997. The co-financing process meant that funding was transferred from the social insurance, municipalities and county councils to a joint budget for the activities within the DELTA-project. Previous financing was tied to each separate authority. By this new procedure, the different authorities legitimatise a closer collaboration cross the borders that would not have been possible to accomplish with the former legislation.

The legislation also implied that politicians from the different authorities established a new political board responsible for the joint budget. The county labour board was also involved in the project by funding selected collaborative projects that might be of value for their clients. Figure 1 shows the structure for the linear organisation of DELTA: The four different authorities, the purchaser board where the four authorities are represented, secretariat and working committees. The figure also shows different groups and networking that was not formally tied to the linear organisation.

Twenty-six different sub-projects were created within DELTA. Different types of multi-disciplinary teams were established that previously had not been prioritised by the authorities individually, but were enabled through joint planning and funding. The subprojects included a range of activities such as general health promotion, medical rehabilitation of persons with long-term sick leave or risk for long-term sick leave and projects aimed at improving employment possibilities for persons who for various reasons had been unemployed for a long period of time. Many of these activities were interlinked within and across subprojects.

The Göteborg component of the SOCSAM trial was evaluated on local level. An evaluation network was established that guided the local evaluation of the DELTA project. The Delta evaluation network included researchers from Göteborg University and evaluators from the involved authorities [4]. The evaluation included some external assessments by researchers using instruments such as EuroQol but the core component was self-evaluation conducted by the personnel in each subproject. Self-evaluation meant that the personnel reflected on and documented the collaboration processes and outcomes continuously during the project [37,59]. The envisioned advantage with this model was that persons with good insight into the projects conducted the evaluation and that the self-evaluation therefore would focus on issues that were relevant for each subprojects. Other envisioned advantage was that the project personnel would gain experiences in evaluation processes and feel involved in the development of the projects. Major disadvantages with the self-evaluation were the difficulty for the staff to be objective, limited evaluation and research experiences among staff and difficulties to evaluate each subproject within the broader framework of the new trial legislation.

The evaluation report [4] concluded that the SOCSAM model effectively facilitates interdisciplinary collaboration. Involved staff from all authorities was in general very positive to the collaboration model. The patients involved in the project were also very satisfied with the collaborative activities. Change in health status was measured among the patients and a positive development was observed. However, no control group was used. There were indications of reduced costs for society as a whole, but no clear conclu-

sions could be drawn due to difficulties to measure impact within a complex system of transfer payments between the different compensation areas.

2 AIMS OF THE THESIS

The main objective of this thesis was to assess if a new co-financing model under the trial legislation SOCSAM contributed to improved care and rehabilitation for people with musculoskeletal disorders. The specific objectives were to determine if there were differences between health centres with the co-financing model and control health centres concerning:

- how staff perceived differences in the character and process of collaboration and if staff in the DELTA health centres perceived that the new legislation led to any changes in the services provided
- contacts with different providers and professionals, health care interventions received and costs of management for patients with musculoskeletal disorders
- changes in health status among patients with musculoskeletal disorders
- sick leave among patients with musculoskeletal disorders

3 METHODS

3.1 Theoretical framework

A model was developed for this research (paper I, Figure 2), which identifies a possible chain of effects from legislation, through changed organisational structure that could create a facilitating environment for improved team work among frontline staff, to effects on patient outcomes. The model emphasises the importance to acknowledge barriers and possibilities that lies within the professionals, the co-location, the impact of the individuals in society and the public opinion. The factors are found on different levels of which organisational structure and economic conditions can be influenced by political decisions and regulations [14] whereas others, such as professional culture [58,117] geographical distance [19,46] and expectations and values in society [98] are influenced by other factors. However, also these may indirectly be modified by political decisions.

Several difficulties are related to implementing new ways of collaboration into the welfare organisations [43,100,101]. Political decisions and structural reorganisations have often not been able to overcome geographical boundaries and different professional culture that inhibit the ability of the welfare sectors to collaborate [47,117]. Rapid organisational changes and organisations suffering from managerial resources interfere with the inter-professional collaboration [126]. Therefore effective implementation of health care reforms needs a model that jointly handles both the planning and the funding responsibilities [14]. In addition, effectiveness of treatment and rehabilitation programmes for patients' health status need to be considered.

In this research project, determinants of interprofessional care which are not directly influenced by the co-financed collaboration, such as factors related to professional culture, values in society, patients' expectations, geographical distance and treatment are viewed as confounding factors when analysing the impact of the trial legislation. The approach to control for them is to include control health centres that are operating within a similar context as the intervention health centres (all are public primary health care centres in the same city). However, differences in the contextual factors still need to be acknowledged and accounted for in the analysis of differences between the health centres that are implementing a new inter-professional structure under the trial legislation and the control health centres. Moreover, if no significant change in the inter-professional collaboration is observed in the DELTA health centres there is a need to consider to what extent the factors in figure 2 have counteracted the intended effect of the legislation.

There has been many attempts to conceptualize and define the activity when staff of different welfare authorities and organisations work together

[12,15,72,100], but there is no conventional definition so far. Axelsson and Bihari Axelsson have developed a conceptual framework of inter-organisational integration and collaboration [8]. The authors define integration between organisations as a horizontal integration and within an organisation as a vertical integration. Public health care that involves many different organisations is defined as an inter-organisational area that has a high degree of differentiation. Since there are many different organisations involved, it requires a high degree of horizontal integration. Depending on what degree of horizontal and vertical integration that exist in an organisation the framework characterises what kind of integration the organisation has. For example, high degree of vertical integration and low degree of horizontal integration has been defined as a co-ordination. This means that integration is mainly achieved through the hierarchy within the own organisation. High degree of both vertical- and horizontal integration means that the hierarchy management decisions are wide enough to allow more informal contacts between different organisations. This is defined as co-operation. High degree of horizontal integration and low degree of vertical integration has been defined as collaboration. The authors define this type of integration as a willingness among staff to work together through close contacts and intensive communications between each other and between different welfare organisations. The framework also states that integration always comprise of both vertical and horizontal integration but to a different degree.

Applying this conceptual framework on the SOCSAM model, the integration between the authorities could be defined as more of co-operation than collaboration. The different authorities voluntarily set up joint agreements but the managers remain in the organisation and the hierarchical structures within each authority still influence the joint working. In the health centres with the collaboration model, the front line professionals could choose to what extent and in what areas they wanted to intensify their collaborative work. That could lead to an integration involving more “co-operation”, if they let the own authority hierarchical system guide their work. On the other hand, there could be more of “collaborating” if the frontline staff reduced their interaction within the own organisation in favour for closer contacts and more intensive communications within the interdisciplinary team with staff from other authorities. It might be easier to increase and improve “collaboration” in short time projects, since the involved personal are more engaged, shared budget, joint objective and with a start- and end time, than in ordinary organisation

3.2 General design

3.2.1 A natural experiment with control group

This research project assessed the effects of a natural experiment. That is, the intervention content and the choice of who to target with the intervention was not up to the researchers, but to the DELTA project staff. It is thus a fundamental limitation of the research project that neither manipulation of the intervention parameters, nor assignment of the intervention was possible.

However, it was still possible to use a controlled design, with DELTA and control health centres. Patients attending three DELTA health centres were compared to similar patients attending four health centres not practicing collaboration according to the trial legislation. The patients were followed prospectively for one year and information was collected through patients' interview, through medical records at the health centres, through the social insurance register and through patient diaries. Apart from the patient follow up, the project also involved a comparative qualitative study on staff-perceptions of the collaborative structure in DELTA and control health centres.

The study was thus observational and non-experimental. However, the design was still prospective in that it followed study subjects over time and documented health care events and health outcomes prospectively. Thus, while not controlling the intervention, the data collection method was controlled by the researchers, which meant that relevant information could be obtained in order to measure appropriate outcomes as well as to control for relevant confounding factors. The latter was very important due to the selection bias of patients receiving or not receiving care under DELTA, which follows from the natural experiment situation.

Baseline information about clinical parameters, demographic variables and socioeconomic situation was collected, as was information about previous sick leave. This enabled an in-debt analysis of the similarities and differences between the DELTA and control groups. As further discussed below, the two groups were found to be rather similar concerning relevant background variables and potential confounders. Nevertheless, the wealth of baseline data allowed a thorough analysis of what background variables were associated with the various outcomes and thus allowed for a control of confounding through multiple regression analyses. Thus, the research was designed so that controlling of confounding effects could be optimised within the limitations of the natural experiment set-up.

3.2.2 The "intervention"

Ordinarily the three DELTA health centres had physicians, nurses, and auxiliary staff employed. In the project, they had the opportunity to extend and intensify the rehabilitation work with other professions, such as occupational therapist, physiotherapist and social worker. Staff from the social insurance office was also located at the health centres. This meant a co-location for the primary health care professionals involved as well as for staff from the social insurance. A closer collaboration with the social service officers was also intended.

The collaboration within the health centres and with the social insurance and the social services was planned to be intensified in several ways. Through the co-financing project, the DELTA centres had the opportunity to intensify the rehabilitation work. The personnel created their own specific goals and made new routines for their rehabilitation work procedure. The rehabilitation work environment was therefore meant to change to some extent for the DELTA health centres. One example of intended new routines was the team meetings. When a patient visited the health care centre the physician, or any other professional, decide if the patient needed a multidisciplinary assessment or not. If there was a need for an assessment, the patient should be put on the list for the weekly meeting. These meetings were to be attended by different professionals and aimed at reaching a common agreement among the personnel about the patient's further assessment and treatment. The patient was also asked to be present at these meetings when needed.

The control health centres were from outside the DELTA project area and did not have any plans for modifying their collaboration around this patient group. Neither the social insurance officers nor the rehabilitation personnel were located at the health centres. There where no closer collaboration between the health centres and the social services officers. The rehabilitation personnel were located at several special rehabilitation units; each one connected to two or more health care centres. Each unit includes physiotherapists and occupational therapists.

The control health centres were matched based on the numbers of inhabitants in the catchments area, overall sickness rate and proportion of immigrants. Overall sickness rate is a constructed measure including the sum of sickness-listed days, rehabilitation days, preventive days and days with pension/sick-benefits divided by the number of persons with sick-leave benefit aged between 16 and 64 (Table 1).

3.3 Design paper II

3.3.1 Subjects

A total of nine focus group interviews were conducted in three DELTA health care centres, four control health centres, and two rehabilitation units linked to the control health centres. The rehabilitation units were included to make sure that both the health centres' and the rehabilitation units' points of views were obtained, since the personnel were not co-located in the control centres. The nine groups comprised of two to eight respondents. Each unit had the opportunity to select their focus group respondents. They were asked to choose one person from each profession, i.e. 4-8 persons. The groups consisted of a mix of professionals such as physicians, nurses, occupational therapists, physiotherapists, social workers, social insurance officers and secretaries. Not all professionals were represented in every group discussion. To reduce the influence of the staff leader on the personnel during the focus group discussion, the staff leaders of each unit were interviewed separately. Each discussion lasted about two hours and all sessions were tape-recorded.

Information about the study was presented at each unit's ordinary staff meeting. Further, letters to the respondents and phone calls to the staff leaders introduced the researchers, presented the aims of the study and the discussion topics and provided an assurance of confidentiality and anonymity.

3.3.2 Data collection

Focus group discussions were used to gain an understanding of the staffs' experiences, perceptions and attitudes of the collaborative process. The method is often used to gain an understanding of people's ideas and beliefs about a specific topic [71,74,94]. The focus group is a special type of group discussion in terms of purpose, size, composition, and procedures. Focus groups can be defined as a group discussion in which usually five to ten persons representing the target group discuss different aspects of a topic in a focused manner [74,94]. Disagreements within the group can promote the discussion and clarify different respondents' point of view and are not to be seen as a negative factor [71]. The advantage of the focus group interview is the generated data that the group interaction creates. The focus group approach also provides insight into the whole group that gives the researcher a broad view of the topic areas.

As the discussion might produce a reflexive element that cannot be ignored, a special self-awareness within the researcher was necessary. Instead of a list of prescriptive questions, a reflective approach was used, which implies the use of a topic guide. Empathic attitudes towards the respondents were at-

tempted in order to acknowledge the value of the information produced [53,86]. All discussions started with the moderator presenting four topics of the discussion. The moderator also clarified the purpose of the study and the method. Thereafter, the moderator only helped to focus on the subject. The two researchers shifted being moderator and taking notes.

The moderators' different professions (physician and occupational therapist) helped to broaden the discussions and avoid biases related to professionally defined preconception. Without presenting a consensus, the focus group discussion should ultimately generate a range of views [13,74,108]. There is a need to be cautious having focus group discussions with workers within an organisation. Staff members not only know each other, but are also often familiar with the values and habits of their colleagues that could influence the discussion. With attention to these difficulties, focus groups can be used effectively in existing organisations according to Krueger [74].

3.4 Analysis paper II

One of the researchers transcribed the notes from the interviews while all researchers read the transcripts. Then the transcript for each interview were organised and coded mainly according to the predetermined interview topics. The nine focus group manuscripts were then divided into two groups and summarised separately for the DELTA and the control group. In order to reduce distortion based on one of the researchers own bias, both researchers performed above steps. Next, overarching themes were identified with an aim to reveal similarities and differences in the collaborative process between the DELTA and control health centres. The final analysis was descriptive-comparative, while no attempt was made to develop a theoretical model based on the analysis.

3.5 Design paper III, IV, V

3.5.1 Subjects

Consecutive patients aged 16-64 attending the DELTA and the control health care centres with a new episode of musculoskeletal problems were included in the study. The physicians were responsible for recruitment of patients into the study. Patients that had attended the health care centres for the same problem within 6 months before the initial visit were excluded. All patients were interviewed at the time of inclusion (within two week after visit) and after 6, and 12 month.

We initially aimed to invite a total of 450 patients during 6 months, based on information on case load in the involved health centres and piloting of

the sampling and data collection approach. However, the rate of identification of suitable patients was much lower than expected and even after the planned recruitment period had been extended by 8 month we only achieved to recruit about half the targeted sample size. Thus, it took more than twice the planned time to reach less than half of the planned sample size.

After 14 month 224 patients had been invited to the study. Fifty-seven patients (25%) were not interviewed either because they could not be found through telephone or by mail (11 patients) or because they declined participation (46 patients). That is 40 (24%) patients from the DELTA centres and 17 (30%) from the control centres. Thus, 167 patients were interviewed initially, 128 from the DELTA centres and 39 from the control centres. Two interviews were completed with 142 patients', 109 from the DELTA centres and 33 for the control, and all 3 interviews with 138 patients, 107 in DELTA centres, and 31 in control centres (Figure 3). A comparison between the included patients and the dropouts regarding age and sex was done and did not show any statistically significant differences between the groups.

3.5.2 Baseline characteristics for patients in paper III, IV and V

There were no significant differences between patients in DELTA (n=107) and controls centres (n=31) regarding lifestyle characteristic at baseline (Table 2). Socio-demographic characteristics at baseline were similar, except that socioeconomic class was significantly different ($p=0,023$) between the DELTA and the control groups (Table 3). Type of musculoskeletal problems and other clinical characteristics were similar in the two groups. The DELTA health centres had a significantly higher percentage of patients who perceived problems within family or work relationship compared to the controls. There were no significant difference between the DELTA health centres and the controls regarding the initial EQ index value (Table 4). The small differences between the groups were controlled for through multiple regression analyses (paper III-IV).

3.5.3 Data collection

Structured interview at 0, 6 and 12 months: A structured interview form was developed. Interviews took place at the health centres or in the patient's home and were conducted by trained research assistants. The base-line interview-form included questions about general socio-demographic background factors (Table 3), and lifestyle factors (Table 2) such as physical activity, body-mass-index (BMI) drug use, alcohol use, and smoking. Socioeconomic class was based on the Swedish Socioeconomic Classification [106].

Clinical background data included reason for visiting primary health care, general health status, previous sick-leave, occupational function, pain and influence of pain (Table 4). To determine change in occupational function, the Canadian Occupational Performance Measure (COPM) was used [77,128,129]. To measure health related quality of life, the EuroQol 5 dimensions instrument (EQ-5D) was used [16,34]. The patient received the EuroQol questionnaire and was told to fill in the form during the interview.

To document what sort of interventions the patients actually received, we initially contacted the professionals involved in the study and asked what kind of rehabilitation program or treatment that was mostly used for this group of patients. Yes/no questions were then constructed. We also collected data about patients' perception of contacts with authorities/professionals [131] and what kind of rehabilitation/treatment the patients received.

Registry data: The allowances for sick leave, early retirement/temporary disability pension and rehabilitation days were collected from the registry of the regional social insurance office. Data was collected on sick leave benefits for totally 18 months, 6 months before and 12 months after inclusion in the study.

Review of medical records: A research assistant entered data from computerised medical records kept in the health care centres into a special data entry form. The number of contacts with different professionals was counted. However, information about number of team-meetings was not available in the records. Information about medical diagnosis was also collected. However, diagnosis was missing for 14 % of respondents and it was judged that the quality of recorded diagnosis was very poor.

Patient diary: In addition to the interview, the participants' were asked to fill in a diary of health care contacts prospectively during the project time. The patients' received one diary by the time of inclusion to the study and a new diary after six months. The diaries thus covered a period of totally 12 months. The diary consisted of two sheets with a short instruction of how to fill in the grids. The patients were also given an oral instruction on how to fill in the diary. The participants should note all contacts with health care, social insurance, social services and the employee office concerning type of organisation, time for contact, how long the contact were and the cause for contact. Patient's diary was then complemented with data on contacts from medical records in the primary health centres.

3.6 Analyses paper III, IV and V

3.6.1 Health status

To analyse the patients' health status several different methods were used. The level of physical activity was measured by a questionnaire described by Kushi et al. on moderate and vigorous activity [75]. Pain character was reported through one question and pain intensity with the Visual Analogue Scale (VAS) with 0 as "no pain" and 10 as "worst" [41]. The outcome on pain character was dichotomised as decreased pain or not. To analyse change in health related quality of life, the EuroQol 5 dimensions instrument (EQ-5D) was used [34]. The change in the value between month 0 and month 12 was calculated and the mean change compared between the groups. Since there is no Swedish index of the EQ-5D we used the UK EQ-5D index tariff, which is based on a representative sample of the UK general public. This index provides a single value for all the hypothetical health states described by the EQ-5D [25,26].

To analyse occupational function, the Canadian Occupational Performance Measure (COPM) was used [77]. Three groups of activities were included: self-care, productivity and leisure. The patient rated "performance" and "satisfaction" with each activity on a 10-point scales ranging from 1 ("not able to do it" or "not satisfied at all") to 10 ("able to do it extremely well" or "extremely satisfied"). Increased or decreased performance or satisfaction was defined as a change of at least two steps, [76] on the scale between measurement at 0 and 12 months.

3.6.2 Sick leave

A "sick leave spell" was defined as any period > 14 days (the first 14 days sick leave compensation is covered by the employer) on full time or part time sick leave. We calculated median and average number of sick leave spells in three 6-months periods: -6-0 months, 0-6 months and 6-12 months, where "0" represents the time of inclusion in the study. Sick leave spells that lasted over two periods were counted as one spell for each period.

"Sick leave days" were calculated as full time equivalents, so that for example two days on 50% sick leave counted as 1 day. To be able to compare unemployed persons' sick leave days, that were benefited in a different way, with others we have deducted the unemployed persons' sick leave days with 13 days. We calculated average number of days per month in each group in order to create a time trend of sick leave days. We also calculated average number of days in the whole 12-month period after inclusion. When comparing mean number of sick leave days between the groups, the baseline sick

leave level (mean number of sick leave days at -6 - 0 months) was controlled for.

3.6.3 Service utilization

We used the patient diaries as basis for counting number of contacts with different professionals and authorities, while using the information from medical records' to identify any health care contact in that facility not noted down by the patient. In the diary, all health care contacts, including those with other public and private health care providers that the concerned health centres were accounted for. Average monthly number of contacts as well as average number of hours in contact with different professionals and with different health services (social insurance, hospital, and employment office) were calculated. If the patient had forgotten the duration we set a standard contact time for each professional contact by asking the professionals for a "normal" duration of counselling.

Information about interventions/treatments received at the visits to different health professionals were collected in the patient interviews. The percentage of patients receiving an intervention was compared between the groups.

3.6.4 Calculation of costs

Unit costs for one hour of contact with different professionals were based on cost estimates from The Swedish Federation of County Councils (physician, nurse, occupational therapist, physiotherapist, emergency primary care), Västra Götalands Regionen, 2004 (social worker, psychologist, hospital emergency/day-care, social services office, x-ray) and calculation from The National Social Insurance Board (2002, unpublished). Unit Costs were multiplied by the average time at different professionals and institutions. We have only counted direct health care costs for 12 months after inclusion and excluded costs for drugs.

3.7 Statistical analysis paper III

The differences between the DELTA health centres and control health centres of reported health status was tested for statistical significance using Chi-squared test for either nominal or ordered scale. To test the statistical significance of the differences in health EQ-5D index value between groups the t-test and a 5% significance level was used. A Multiple linear regression analysis was done to control for potential confounding effects. Baseline EQ, age, sex and all background factors significantly associated with change in EQ-5D were included in the initial model. The final model was estimated after

stepwise exclusion of variables (Table 5). No adjustment for clustering effects was done.

3.8 Statistical analysis paper IV

Mean number sick leave days were compared between the groups while controlling for baseline sick leave. Parameter estimates and significance test were performed in the original scale of the data, rather than after log or rank transformations. We tested the statistical significance of association between possible predictors and sick leave days by t-test for dichotomous variables and test of correlation for linear variables. Then, a multiple linear regression analysis of difference in sick leave days between the health care centres was performed with the significant predictors ($p < 0.05$) from the univariate tests as covariates: sick leave days 6 months before inclusion, perceived pain, pain according to VAS, socioeconomic group (SEI), high BMI and pain in arm/hand. SPSS was used for the statistical analysis.

We tested the appropriateness of using standard parametric tests despite the skewed distribution of sick leave days and the small sample size by performing a permutation test of a multiple linear regression model [5] on a special program developed for this purpose. This analysis did not assume that the errors in the model follow a normal distribution, but that they are independent and identically distributed. The analysis using the method described as permutation of residuals under the reduced model in the reference above yielded almost identical results as the parametric tests and we therefore concluded that the sample size for our data is large enough for the results from standard parametric significance tests to be valid.

3.9 Statistical analyses paper V

To test the statistical significant difference in mean number of contacts between the intervention health centres and control health centres the chi-squared test and the Mann-Whitney U test were used.

3.10 Ethical clearance

The Ethics Committee for Medical Research at Göteborg University approved the study. The participants had given their informed consent, after they had received oral and written information about the study, including an assurance that they could withdraw from the study at any time.

4 RESULTS

4.1 Results paper II

Both the DELTA and the control health centres reported ongoing internal and external collaboration. However, there was an expressed need in the DELTA health care centres as well as in the control health centres for further engagement in the collaboration process. This concerned intra-personnel collaboration as well as collaboration with other providers and authorities.

The respondents at the DELTA health centres described fairly well functioning collaboration, both internally and with the social insurance, but the respondents expressed a need for more time and skills in order to achieve effective collaboration. However, the new way of working together had opened for new ways of communicating, which also was the reason for the improved collaboration, according to the respondents. Informal meetings at coffee breaks, during lunchtime, and in the corridor were common. It had been easy to start a dialogue with another professional and get to know each other, then meet again and deepen the dialogue at the formal team discussion.

The collaboration between physicians and other health care professionals had been insufficient according to respondents from the DELTA health centres. The reported reason for this was a lack of physicians due to a number of vacant positions, as well as a lack of interest among physicians in working closely with other professionals. This more peripheral role of physicians at the DELTA health centres had meant that other staff categories, such as physiotherapists and social workers, had taken a more central role in co-ordination of assessment and rehabilitation planning. The relocation of social insurance officers from the social insurance office to the health centres was one of the most important improvements, according to the respondents.

To be able to establish specific rehabilitation teams as well as the new political organisation, the different authorities legitimatised a closer collaboration cross the borders that would otherwise have been difficult to accomplish according to the respondents.

The respondents from the control health centres expressed a relatively good collaboration within the health centres (between physicians and nurses). However, the collaboration with the rehabilitation units, the social insurance units and the social welfare units had been poor. The poor collaboration with the rehabilitation units was mainly because of the long geographic distance between the units that forced all communication to be through answering machines and letters instead of direct contact. The respondents also thought that access to rehabilitation units was poor due to personnel being preoccupied with projects aimed at other target groups. This had also made

it difficult for the health centre personnel to know what kind of patients they could refer to the rehabilitation units. Lack of engagement, time and understanding for each other's situation as well as lack of communication and respect for each other's profession were pointed out as causes of poor collaboration.

4.2 Results paper III

More than half of the patients in both groups increased their perceived pain level between the first and the last interview. In the third interview, 78% (84/107) in the DELTA group and 81% in the control group (25/31) answered yes to the question, "Do you still have the same problem as you described in the first interview?"

The mean change in EQ-5D index value between baseline and one year follow up were +0.145 for patients in the DELTA health centres and +0,069 for controls, but the difference was not statistically significant ($p=0.27$). After controlling for potential confounders through multiple linear regression modelling the difference decreased (Table 5).

Change in performance and satisfaction with different daily activities (measured with COPM), after 12 months compared to baseline, were not significantly different between the intervention and control groups (Table 6).

4.3 Results paper IV

At 12 months, the proportion of patients sick listed was 31% in the DELTA group and 32% in the control group. The DELTA group had an average of 94 days and the controls 87 days on sick leave during the 12-months period after inclusion. The difference was not statistical significant. The DELTA group had higher average number of sick leave days during most of the 12 follow-up months (Figure 4). At baseline 64 persons (60%) in the DELTA group and 14 persons (45%) in the control group were on sick leave. After 12 months there was a higher proportion of sick-listed persons among the initially sick listed in the control group than in the DELTA group. Among those not initially sick listed, a higher proportion in the DELTA group was sick listed after 12 months. The proportion of part time sick-leave spells was higher in the DELTA group than the control group for all 18 months, but the difference was not statistically significant.

4.4 Results paper V

During 12 months after inclusion, the patients in both groups were in contact with on average 3 different professionals. The proportion of patients in contact with any professional was higher in the DELTA than in the control group most of the 12 follow-up months (Figure 5 and 6). The difference was mainly due to DELTA patients having more contacts with physiotherapists than the control patients especially during the first months after inclusion in the study (Figure 7). Eighty-three per cent of the patients in the DELTA group and 39% in the control group received physiotherapy. Contacts with other services such as social insurance office, social services office or hospital did not differ significantly between the groups (Table 7).

Thirty per cent of the patients in the DELTA centres were in contact with both primary health care and the social insurance office during 12 month after inclusion. Fifty per cent of those who were sick listed (72 persons) at the DELTA centres and thirty per cent of those who were sick listed (17 persons) in the controls were in contact with the social insurance office some time during 12 months after inclusion. The difference was not statistical significant. A majority of the patients in both groups did not have any contact with the social insurance, social services or the employment office.

The DELTA group received significantly more of some types of physiotherapy, while the control group had significantly more of some types of occupational therapy. There were few other significant differences between the groups concerning the type of treatment that patients' received (Table 8).

A majority of the participants in the DELTA- and control health centre perceived that they had received adequate information, support and encouragement and that their needs had been taken well care of by the staff at the health centres.

The average health care cost was estimated to be 18,097 SEK (1,979 Euro) for the DELTA group and 11,762 SEK (1,286 Euro) for the control group.

5 DISCUSSION

The study design was inspired by Donabedian's model of "structure, process and outcome" in order to assess the different levels of interventions - the trial legislation, the new approach of team working, and the new approaches for treating and rehabilitating patients - in a systematic way [27]. Below, the results are discussed in relation to this framework, starting in reversed order. Thus, outcome on patients are discussed first, then changes in the professionals' working process and finally these results are discussed in relation to the change on structural level intended by the trial legislation SOCSAM.

5.1 Effects on patient outcome

The DELTA project, based on the SOCSAM model, aimed to make care and rehabilitation more efficient and to shorten and improve the rehabilitation process. We could not find any evidence that the co-financing model was associated with better health outcome or reduced sick leave for patients with musculoskeletal disorders attending these health care centres (paper III and IV). The placing of staff from social insurance at the health centres was expected to make a difference for the handling of sick leave certificates between the two authorities. However, paper IV did not show any reduction in the number of sick leave days among the patients in the DELTA group compared to controls. There was a higher proportion of part time sick leave among patients in the DELTA centre. However, this difference was not statistically significant.

We have only measured sick leave days that were compensated by the social insurance that start from day fourteenth in a sick leave period. Thus we miss those first seven days when an insured person can certify a sick-leave period by themselves, as well as the next seven days that are certified by the physician. These days are paid by the employer, and not included in the social insurance registry data. Any differences between the groups in short-term sick leave have therefore not been accounted for. However, in the interview the participants had to answer if they had been on repeated sick leave in the last year. The results showed that only a few persons reported repeated sick leave and there were no differences between the groups.

5.1.1 Possible reasons for lack of effect

It is possible that the research project failed to show a positive effect of the trial legislation due to low statistical power. This is further discussed in the section on methodological limitations below. It is also possible that no effect was found because the groups were not comparable, due to selection bias.

Assuming that there was in fact no positive impact on patient health status or on sick leave, the lack of effects of this new collaboration model on patients' health could have several explanations. One possible explanation is that the working procedures have not really been changed substantially compared to earlier ways of working. Although we know that there were new activities such as the team meetings, attended by all professionals every week, the patients still only met one or two professionals during the first month (paper V).

Second, the type of clinical interventions such as treatment and rehabilitation programs only showed small differences between the groups. The patients at the DELTA centres received much more physiotherapy than the controls but the type of treatment was almost the same for both groups. Thus, the patients seemed to receive "more of the same" rather than an innovative approach to care and rehabilitation.

Unfortunately, the evidence base is weak concerning the effectiveness of rehabilitation programs for musculoskeletal disorders [68,122]. Normal physical activity has been shown to shorten sickness absence in persons with low back pain who have been sick listed for 8 to 12 weeks [85]. There is also evidence that normal physical activity for acute low back pain and chronic neck pain leads to more rapid recovery than special training/exercise treatment [82,125]. Therefore, instructions about normal physical activity for patients with back pain may be an adequate treatment instead of longer periods of physical therapy.

To involve persons representing the patients' workplace in the discussion of the rehabilitation program is important since working conditions have a major impact on the results of rehabilitation [32]. Also, work-related rehabilitation has been shown to be more effective if professionals work closer together in a more client-focused way [48]. Work place visits were very rare in both the DELTA and the control group, although it has been proven to be an important factor to make persons on sick leave return to work (paper V) [67].

Intensive multidisciplinary bio-psycho-social rehabilitation has been shown to have effect on chronic back pain [50,89]. These intervention programs require staff from different disciplines and authorities [87]. This was the situation in DELTA health centres. However, it was up to the staff to decide what kind of professionals that were needed in the interdisciplinary teams. From the data collected, we cannot show that there has been any clear intention of using a multidisciplinary bio-psycho-social rehabilitation approach for patients with musculoskeletal disorder. For example, the social worker at the DELTA centre was more seldom involved in patients' rehabilitation

compared to the controls and the psychologist was rarely involved. Since these two professional categories are central in the bio-psycho-social program, their participation in the rehabilitation program would be necessary to achieve desired effects.

Why is it that the latest evidence of effects of different rehabilitation approaches did not seem to have influenced the choice of interventions for this patient group? Organisations might lack routines for systematically updating treatments and rehabilitation programmes according to latest scientific information because of lack of time to work with quality assurance and routines for these matters. However, with the opportunity that SOCSAM and DELTA gave it would have been valuable for the project to look in advance more deeply into what kind of interventions has impact on health status and sick leave.

5.2 The interdisciplinary working process

The interdisciplinary working process involves what kind of professionals that is included and how they relate to each other and to the patients. The "process", according to Donabedian, is more directly related to the "outcome" than the characteristics of "structure" [28]. It is however, important to notice that there is a difference between the quality of the process and the outcome of the process. In this project, we focused on both the quality of the process of care, with regard to the personnel's perception of collaboration, and on the quality of care with regard to effects on patients' health.

Early and well-coordinated intervention was one of the main objectives of the DELTA project in the three health centres. We found that patients at the DELTA centres did receive more treatment early in the rehabilitation process, but also that the magnitude of health care used continued to be more extensive throughout the 12 months compared to the controls (paper V). This could indicate that the early intensive intervention attempts did not lead to reduced need for care later in the rehabilitation process. There are contradictory evidence of the assumption that early intervention is more effective than later interventions with regards to reduced sick leave days and cost savings [42,51,73].

Our data do not suggest that teamwork through new constellations of professionals was more common in the DELTA group than among controls. Further, we cannot be sure that coordinated assessments really took place earlier in the rehabilitation process in the DELTA centres since data on time of joint assessments were not available. Therefore, it is uncertain if the interventions were well coordinated or not. The patients in health centres with the co-financing model met on average one or two professionals, which was

not different from the controls. The patients at the DELTA centres often met physicians and physiotherapists instead of meeting a team. These patients had twice as many contacts and spend more hours with the physiotherapists compared to the controls.

This result is not odd or a new phenomenon. Patients with musculoskeletal disorder have a majority of their contacts with physiotherapists, [39,56] although research shows that interventions undertaken by single physicians and physiotherapists have limited effect on health or work resumption for this group of patients [50,56,107]. The results therefore indicate that the working methods have only changed marginally. One possible reason is that co-financing lead to a new interdisciplinary team structure but not to new team work.

The introduction of occupational therapists, physiotherapists and social insurance officers in the Delta health centres were perceived as positive changes by the staff, (paper II). The social insurance and health care personnel also perceived that the co-financing and the joint political steering were necessary conditions to facilitate co-location and thereby interdisciplinary collaboration. Through legitimising formulation of common long-term goals and emphasising mutual benefits, collaboration based on joint financial and political grounds could be achieved. However, there seem to be a need to improve the collaboration between all four authorities further.

Another possible explanation for lack of effect is that impact may be seen first after a longer time period of collaboration. Thus, it might not be possible to assess impact after a relatively short duration of collaboration.

Could there have been a "contamination" of working procedures from DELTA health centres to control health centres that attenuated the effects? During the project time other geographical areas in Göteborg did not have the possibility to implement the co-financing model or a joint political board. However, it is possible that some positive effects of former collaborative projects such as "Dagmar projects" still occur in the primary health care. In the -90s several so called "Dagmar" projects received money from the government. These projects aimed to stimulate collaboration between staff and improve treatment and rehabilitation among patients [130]. However, there where no "Dagmar projects" or other similar project ongoing in the areas of the included health centres at the time of study.

5.2.1 The social insurance officer's role

Fifty per cent of the DELTA patients on sick leave and 30 % of the controls on sick leave were in contact with both the health care staff and the social

insurance officer. If all patients are included, both those on sick leave and those not on sick leaves, only thirty per cent had contact with a social insurance officer among DELTA patients. Thus, though the opportunity for staff at the DELTA centres to involve the social insurance officer with persons at risk for sick leave, this did not occur very often. Opportunities to prevent sick leave, and find appropriate alternatives, may therefore have been missed.

One social insurance officer located at the health centre might find it difficult to influence health care personnel. To be able to understand this relationship there is a need to look more in-depth at the collaborative process since the contact with the own professionals has been proven to be an important and valuable link to maintain the own professionalism [81].

5.3 The SOCSAM and DELTA structure

The “structure” of an organisation is defined as the conditions under which the care is provided [28]. The structural changes prompted by the SOCSAM trial legislation, including the co-financing and the joint political board, should influence the organisational structure that may influence the team characteristics and thus how staff behave in the system.

The government has, through the SOCSAM legislation, created mechanisms for the organisations to work more intensively with their internal and external collaboration. However, it should not be the legislators’ responsibility to actually work with this issue on the local level. Thus, it is the organisations’ task to develop the collaboration and put it into practice. The legislators’ intention was to let each organisation develop new working procedures and then jointly draw up structures that improved the inter-authority collaboration. This might however take more time than that available for this research project.

To make inference about quality there have to be a predetermined relationship between “structure”, “process” and “outcome” [28]. The way a health care reform is set up and managed should have a general bearing on the organisation and how the personnel behave. Thus, the organisational structure should be the major determinant of how well the organisations function. The structure between several organisations is also important since it is the environment where the inter-organisational and inter-professional process works. However, sometimes the function of an organisation has to rely on committed staff only. Therefore, the joint structure between the authorities should be strengthened and thereby become the fundament of the collaborative process. It is possible that the organisational and political structure within each authority were good while the joint working procedures needed more time to develop. These joint procedures involve treatment and the

rehabilitation programs, patient education as well as professional development.

As mentioned, the trial legislation did not present advice or guidelines for the different projects. The staffs in each project were responsible for the local structure. Each project therefore designed their own project based on their special circumstances. One of the ideas to run projects is that they should grow and develop along the way. New insights about working behaviour should result in establishment of new activities but also disappearance of those that do not work. As much as it is important to let the spirit run free, it is equally important to control the structure and the developing working process and outcome among staffs and patients.

The local evaluation of the DELTA project [4] showed that staffs from different authorities perceived improved professional development through these collaboration projects'. During the project time, the staff's perceived that new professional roles were developed. The staff described it as a new way of thinking that resulted in an organisational competence and a new openness to learn about new professions competencies and work procedures. This new professional role also included the individual competence that was linked to the own profession as well as a joint working competence. As a consequence, it was perceived that areas of collaboration as well as professional and organisational boundaries were more clearly defined. However, this process of joint work in a "different professional culture" had been more difficult and time consuming than many of the participating staff realised in the beginning of the project.

This thesis strengthens the above conclusions about the staff's professional and personal development, but also identifies difficulties within the collaborative process. In the qualitative study, the professionals spoke of a learning process that was created during the project time. The staff learned ways to collaborate, which they described as a common knowledge. It seems as they have learned a way to collaborate but still lack effective behavioural changes. In early stages of the team developmental process, team members become anxious to participate in the team according to Farrell et al. [35]. That might be the reason why the team developmental process in the health centres still is in the early stage and the informal role differentiation that is significant for these early stages is still going on.

There is no clear scientific evidence that team-collaboration is more effective than other working methods when it comes to reducing costs [64,100]. In this study, we conducted a simple calculation of the units costs multiplied by the average time at different professionals and institutions. Not surprisingly,

with both more contacts and longer contacts, the DELTA centres costs per patient were higher compared to the controls (paper V).

5.4 Methodological considerations

There are a number of methodological limitations associated with observational assessment of a natural experiment. The most serious limitation is the risk of selection bias. To be able to compare the two groups carefully and control for any important differences, we collected information about a large number of baseline variables, including demographic characteristics, lifestyle and clinical data. The small differences that were found between the groups initially did not seem to have confounded the results, judging from the results of the multivariate analyses.

However, it is still possible that there was residual confounding. In particular, it is possible that the DELTA and control centres had somewhat different inclusion of patients because of the special project status of the DELTA centres, although we did not find any such differences. The physicians at the DELTA and the control centre might have included different kind of patients along more subtle clinical characteristics such as severeness and/or disease related work ability, which may not have been captured with the instruments used (structured questionnaire, EuroQoL and COPM). A more limited inclusion criteria, e.g. only one specific musculoskeletal diagnosis, could potentially have improved comparability between the groups, but this would have limited the scope of the study and created even more problems with achieving a sufficient sample size.

The small sample size results in high risk of failing to demonstrate a real difference (type II error), if there was one. Therefore, the data must be interpreted with caution and does not provide evidence that co-financed inter-professional teamwork cannot have a positive effect on health status and sick leave for patients with musculoskeletal disorders. The physicians had a central role collecting data since the inclusion of patients were based on their medical assessment. One of the main reasons for the small sample size was the difficulty to engage the physicians to include patients into the study, particularly at the control health centres. Based on informal observations, we believe that many potential study patients were not asked to participate due to a combination of time constraints and lack of motivation among physicians. To choose nurses or other staff categories for the inclusion of patients instead of physicians might have resulted in a larger sample size but also a lack of a medical assessment. Thus, it is important to select professionals that are interested in taking active part in the study. It is also important to have an enabling work environment with appropriate incentives for health care

staff that are expected to contribute to the research in primary health care organisations.

We choose to use musculoskeletal disorders as criteria for inclusion instead of a more specified diagnosis since that might have decreased the number of participants even more. We also made it easy for the physician to include patients. The physician were asked to ask the patient to participate and if the patient said yes the physician should print out the patients name and phone number and put it in a special box. This information was then collected by the interviewer. We believe that this way of handling the inclusion interfered very little with the physicians' work.

Clusters of patients from seven health centres were included in the study. Therefore, a cluster effect is possible. Accounting for any clustering effect would have reduced the statistical power even further. The results would still not have been statistically significant. Therefore, the conclusion that the studies failed to reject the null-hypothesis of no differences would not have changed, had clustering been accounted for.

We followed up the patients with personal interviews, to increase internal validity and reliability. The longitudinal design might have increased the dropouts. Maybe a postal questionnaire could have reduced the dropouts but we chose interview in order to obtain complete answers to all questions and to be able to clarify if the patient did not understand a question.

A novel data collection tool, the patient diary, was used to collect data on patients' health care contacts both with the DELTA and control health centres, and with all other health care providers and welfare authorities. This provided unique prospective data on health care utilisation, which would have been impossible to capture through the medical records since these are restricted to the separate health facilities and were not possible to link between facilities on patient level. Nevertheless, it is a weakness that we have not been able to describe the treatment and the rehabilitation programs from the health professionals' viewpoint in more detail.

Another unique aspect of this research project was that it attempted to cover three levels - the legislative, inter-professional team work and the patient outcome. The intention was to examine the structural legislative influence on the frontline professionals' work procedure and than assess its effects on patients health. However, to combine these three levels in one research project was not only innovative. It was difficult too, as discussed above.

6 CONCLUSIONS

We found that professional staff involved in co-financed collaboration under SOCSAM perceived that the co-financing model was important for the collaborative process and that it had stimulated new interdisciplinary team structures. However, we could not find any evidence that the co-financing model was associated with better health outcome or reduced sick leave days for patients with musculoskeletal disorders in three primary health care settings operating under the DELTA project in Göteborg, compared to health centres which did not have co-financed collaboration projects.

Nor did the results show any fundamental differences in the type of care and rehabilitation approaches between DELTA and control health centres. This may explain the lack of differences in health outcome and sick leave between the groups. Though similar treatments were provided in the DELTA and control health centres, patients in the DELTA health centres received more of those treatments, notably more physiotherapy. The costs were therefore higher for patients in the DELTA centres.

SOCSAM has created conditions for better collaboration between authorities and organisations and DELTA has developed innovative collaborative structures based on these conditions. However, though new structures for inter-professional care and rehabilitation of people with musculoskeletal disorders were established under DELTA, the actual care and rehabilitation approaches had not changed significantly and seemed not clearly inter-professional in practice. It can therefore be concluded, that the potential for improved collaboration created by SOCSAM and DELTA has not yet been fully realised in the studied initiatives.

In 2004, SOCSAM became a permanent legislation. It is important for future initiatives under SOCSAM not only to focus on the collaborative structures, but also to carefully review the evidence base for planned interventions and approaches.

It should be stressed that this project concerned only a small part of all the collaborative activities under DELTA and SOCSAM. DELTA also targeted other groups, including persons with psychiatric disorders or drug abuse, people with long-term unemployment, etc. The results reported in this thesis cannot be readily generalized to other DELTA projects and other initiatives under SOCSAM. Furthermore, since the sample size was small and an observational design was used, the data must be interpreted with some caution.

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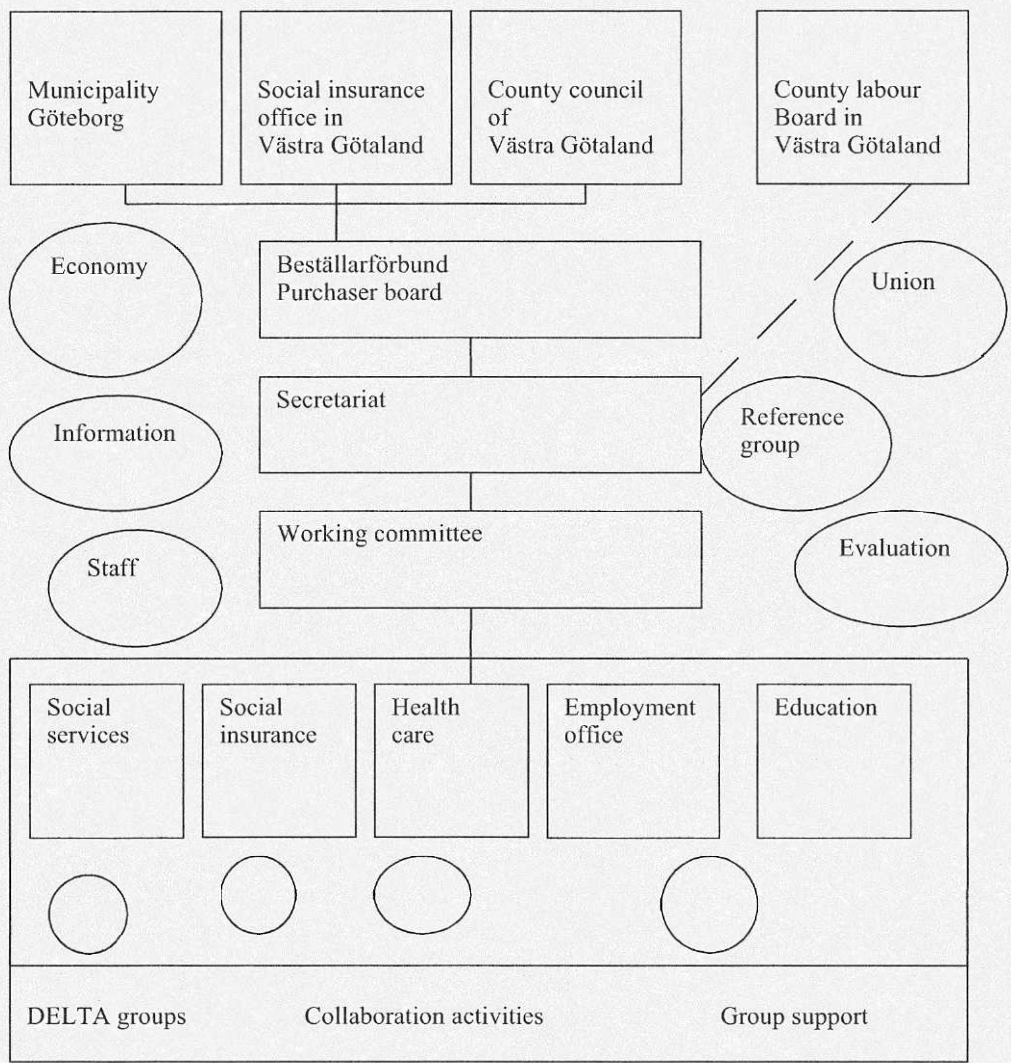


Figure 1. The Delta organisation with its formal linear organisation (boxes) and other constellations (circles) [4].

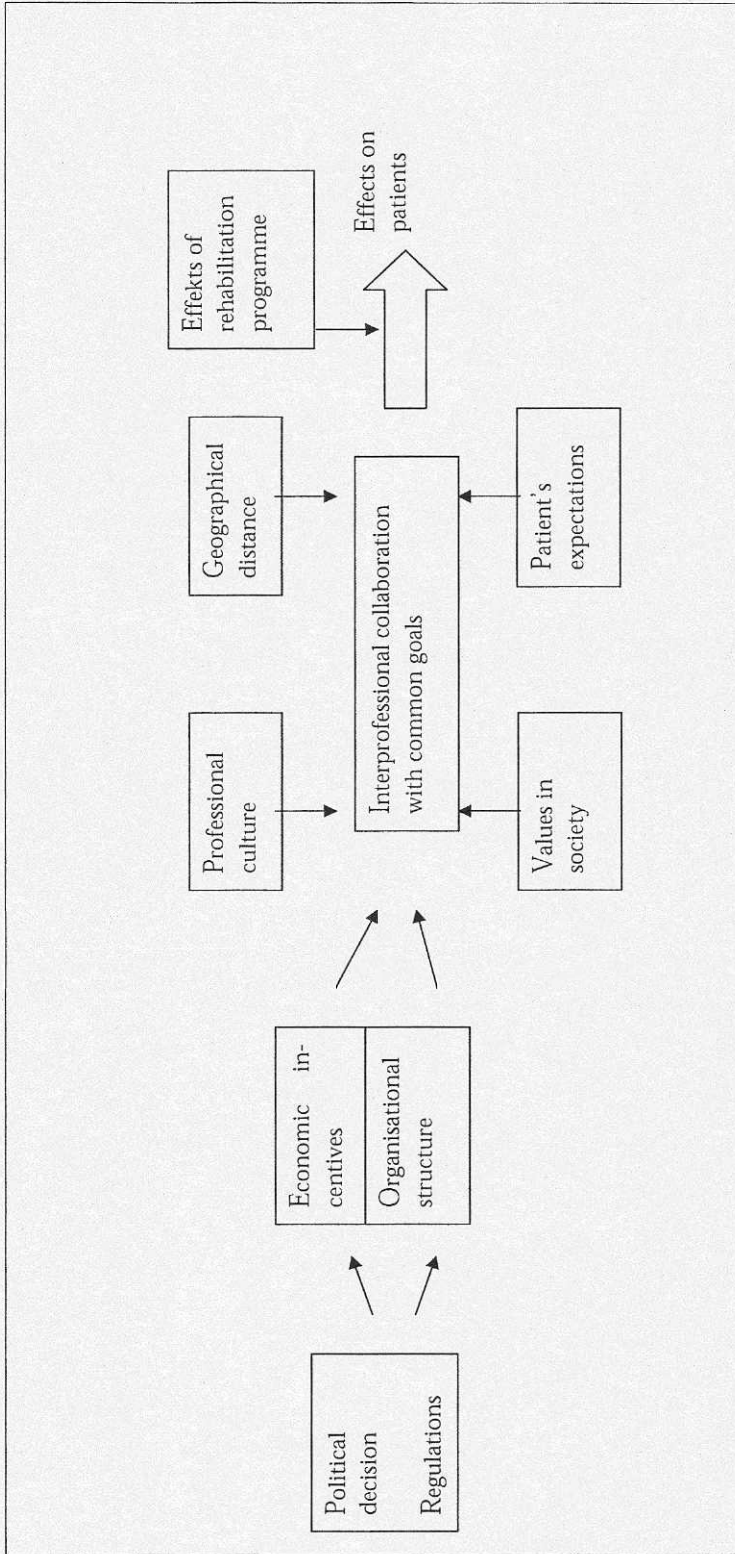


Figure 2. The theoretical framework of the project.

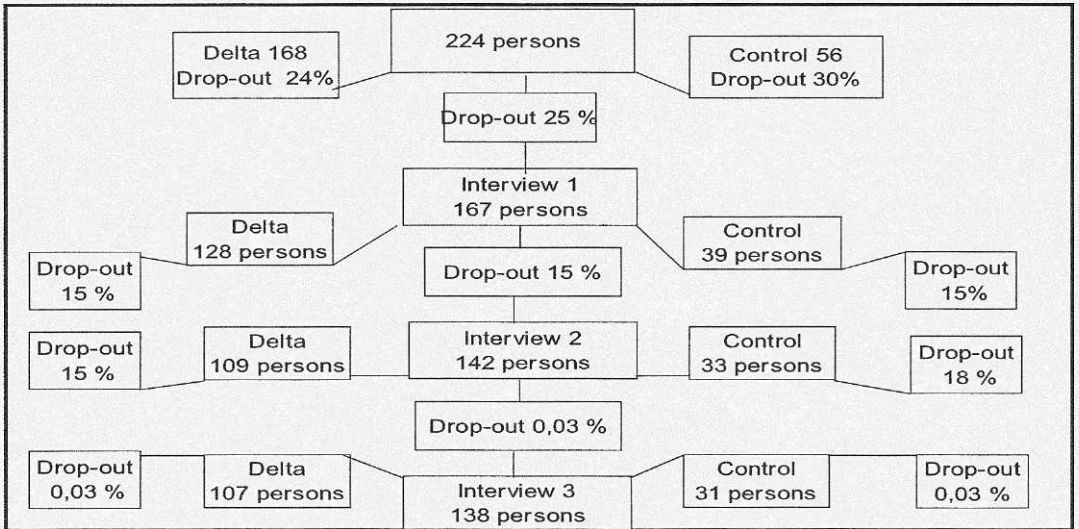


Figure 3. Description of inclusion procedure of patients in the study.

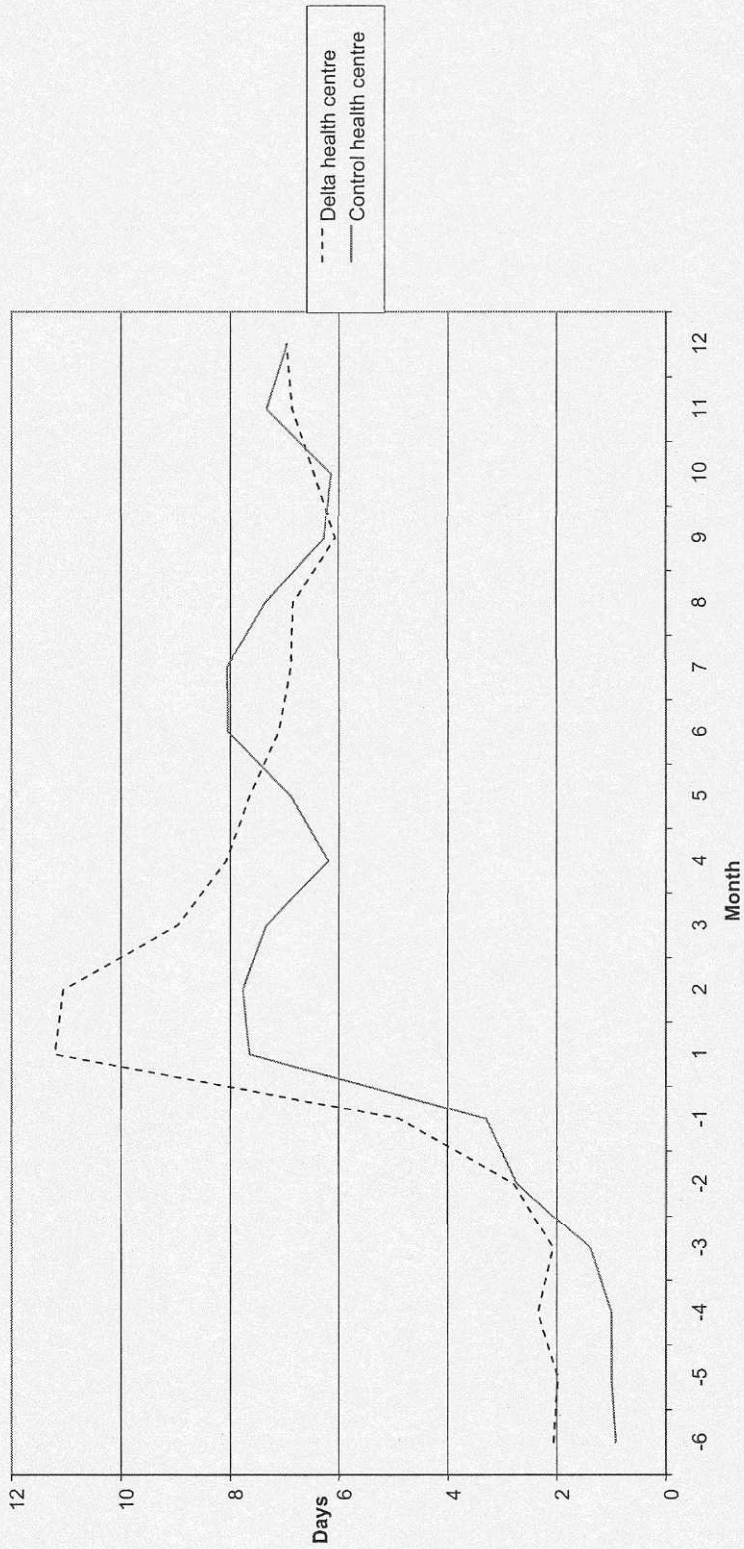


Figure 4. Monthly mean number of sick leave days 6 months before and 12 months after inclusion in the study for the DELTA and control groups.

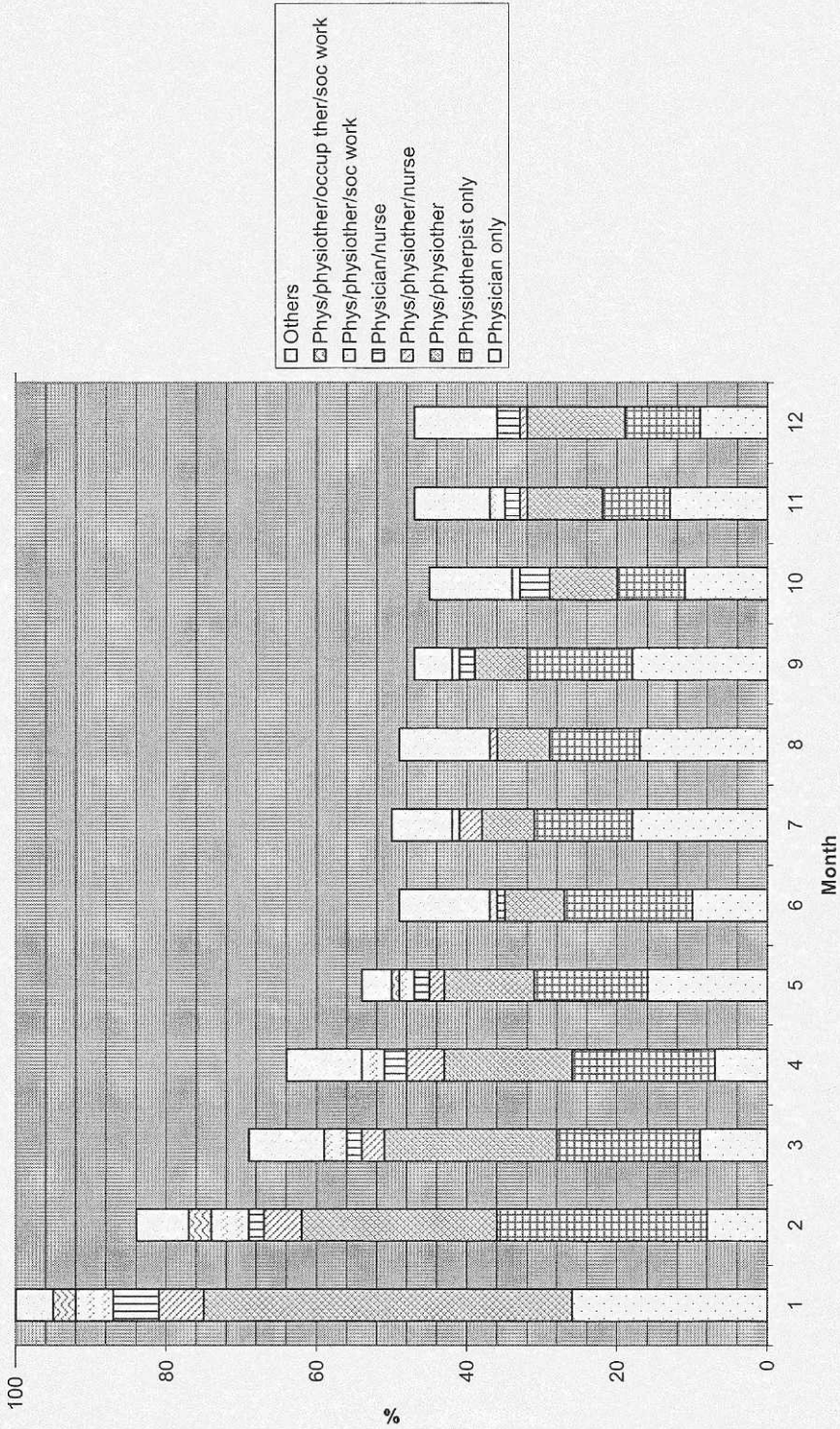


Figure 5. Patients' contacts with different professionals, DELTA group.

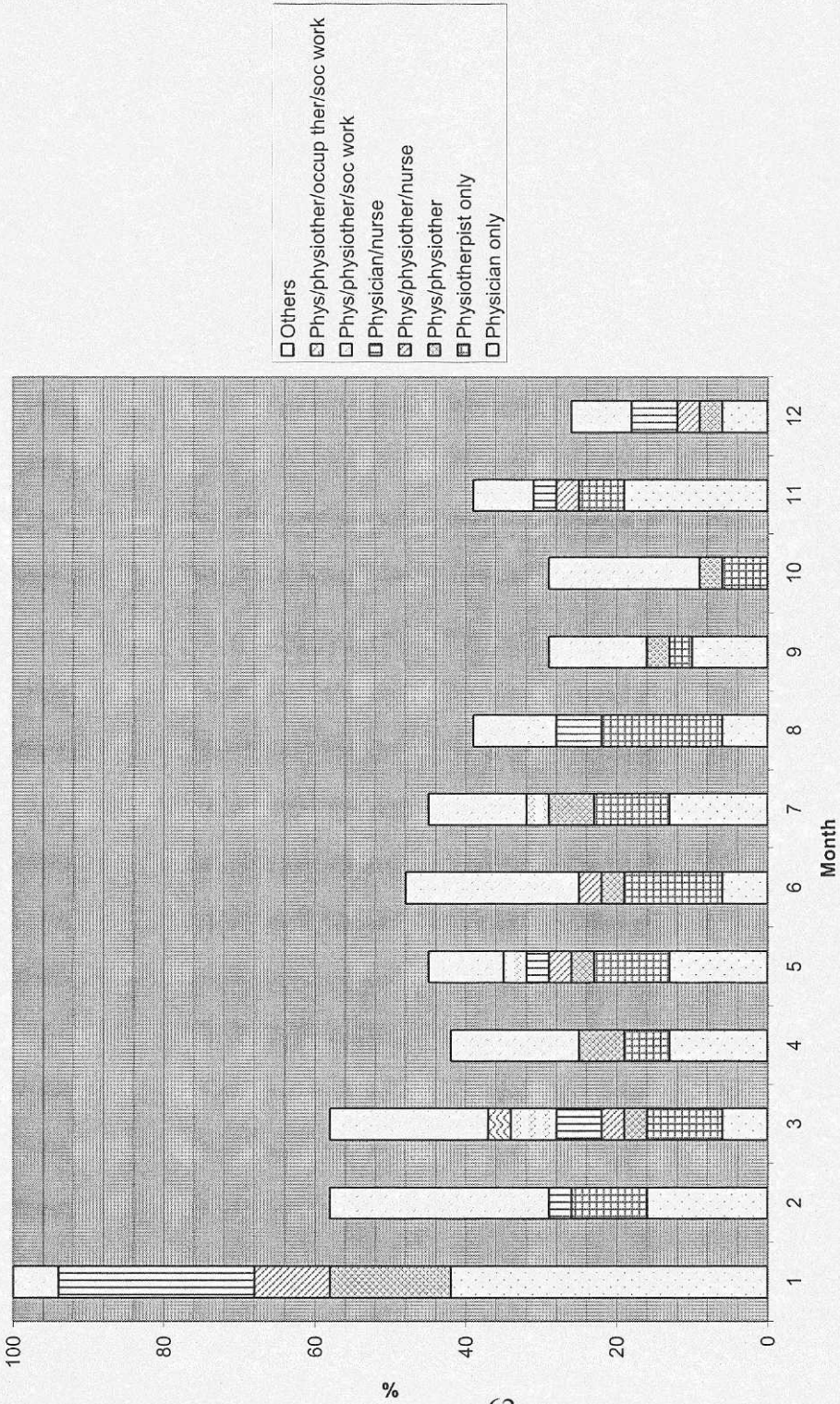


Figure 6. Patients' contacts with different professionals, control group.

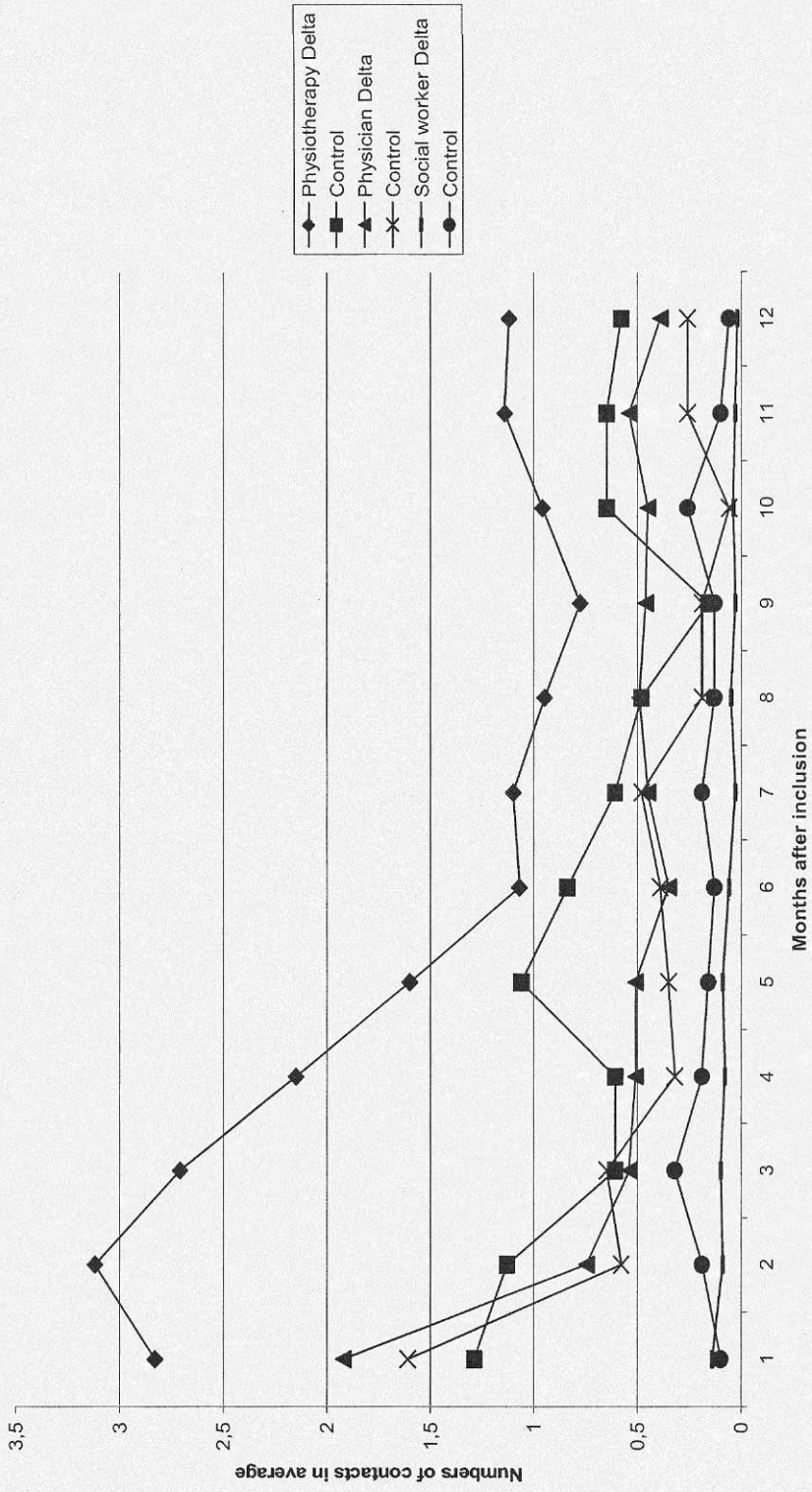


Figure 7. Mean numbers of contacts with physiotherapists, physicians and social worker 12 month after inclusion in DELTA and control groups.

Table 1. Basic characteristics of catchment populations for the health centres included in the study, 2000.

DELTA Health centres	Inhabitants 16-64 year	Overall sickness rate 16-64 year	Proportion of immigrants (%)
Backa	14,489	60,5	7,4 %
Kärra-Rödbo	6,312	40,7	2,9 %
Biskopsgården	8,242	63,25	16,1 %
<hr/>			
Control Health centres			
Gamlestad	7,386	56,8	9 %
Ekmanska	7,156	25,1	4 %
Bergsjön	8,657	92,7	26 %
Munkebäck	8,244	33,4	3 %

Table 2. Initial lifestyle characteristics of the respondents in the DELTA and control health centres.

	DELTA health centre n= 107		Control health centre n=31		p
	n	%	n	%	
Smoking					
No	65	(61)	18	(58)	0,788
Yes	42	(39)	13	(42)	
BMI					
Underweight <17	1	(1)	0	(0)	0,147
Normal 18-25	58	(54)	21	(68)	
Overweight 26-30	30	(28)	8	(26)	
Obesity >30	18	(17)	2	(6)	
Physical activity					
Low	10	(9)	6	(19)	0,134
Medium	44	(41)	13	(42)	
High	53	(50)	12	(39)	
Frequency of consuming alcohol					
Never	16	(15)	11	(35)	0,070
Moderate	88	(82)	18	(58)	
High	3	(3)	2	(7)	
Experienced alcohol-related problems					
No	101	(94)	28	(90)	0,419
Yes	6	(6)	3	(10)	

Table 3. Basic characteristics of the respondents in the DELTA- and control health centres.

		DELTA health centre n= 107		Control health centre n=31		p
		n	%	n	%	
Sex	Female	68	(64)	25	(81)	0,074
	Male	39	(36)	6	(19)	
Age	16-30	23	(21)	8	(25)	0,093
	31-50	53	(50)	20	(65)	
	51-64	31	(29)	3	(10)	
Family type	Married	75	(70)	19	(61)	0,645
	Single	22	(21)	8	(26)	
	Other	10	(9)	4	(13)	
Origin	Nordic country	83	(78)	22	(71)	0,448
	Other	24	(22)	9	(29)	
Socioeconomic group						
	Blue collar worker	49	(47)	14	(45)	0,023*
	White collar worker	37	(34)	4	(15)	
	Unemployed	11	(10)	5	(15)	
	Others	10	(9)	8	(25)	
Education						
	Compulsory, 5-16 year	26	(24)	6	(19)	0,571
	Further education					
	18/19 year	65	(61)	18	(58)	
	Higher education	16	(15)	7	(23)	

Table 4. Initial clinical characteristics of the respondents in DELTA- and control health centres.

	DELTA health centre n= 107		Control health centre n=31		p
	n	%	n	%	
Pain, VAS					
0-2	9	8	5	16	0,697
3	13	12	4	13	
4	18	17	4	13	
5	17	16	4	13	
6	10	9	4	13	
7	21	20	4	13	
8-10	19	18	6	19	
Long-time sick-leave (>3 month) Yes	13	12	3	10	
No	94	88	28	90	
Repeated sick-leave last year Yes	9	8	2	7	0,723
No	98	92	29	93	
Numbers of physical problems					
1	11	10	8	26	0,106
2	18	17	6	19	
3	10	9	6	19	
4	15	14	1	3	
5	20	19	3	10	
6	10	9	2	6	
7-10	23	22	5	17	
Diagnosis, ICD 10					
Low back pain	25	21	15	49	
Connective tissues disorder	39	37	10	33	
Cervicobracial syndrome	6	6	1	3	
Psychical disorder	3	3	1	3	
Other diagnosis	17	17	2	6	
Lack diagnosis	17	17	2	6	
Perceived crisis/anxiety					
Yes	46	43	12	39	0,671
No	61	57	19	61	
Perceived problems within family/work relationship					
Yes	59	55	8	26	0,003*
No	48	45	23	74	
Pain No/intermittent pain	50	47	15	48	0,871
Continuing pain	57	53	16	52	
EQ index value	mean		mean		p
	0,46931		0,54516		0,229

Table 5. Results of multiple linear regression analyses with change in EQ 5-D index value as dependent variable.

Model	Unstandardized Coefficients			
	B	Std. Error	t	Sig.
Non-Nordic origin	-0,196	0,058	- 3,367	0,001
Perceived crisis/anxiety	0,107	0,051	2,100	0,038
Initial EQ-5D assessment	-0,734	0,082	- 8,971	0,000
DELTA health centre vs. Control health centre	-0,019	0,055	-0,341	0,734

Dependent variable: change of EQ 5-D index value between the first and the third interview.

Table 6. Patients' reported changes in performing different activities between the first and the third interview (COPM).

Dimension	Performance			Satisfaction			p
	n	Decreased %	Increased %	n	Decreased %	Increased %	
Personal-care							
DELTA health centres	107	23 (21)	35 (33)	107	26 (24)	37 (35)	0,657
Controls	31	9 (29)	10 (32)	31	10 (32)	11 (36)	
Functional mobility							
DELTA health centres	107	18 (17)	35 (33)	107	26 (24)	36 (34)	0,695
Controls	31	8 (26)	9 (29)	31	9 (29)	10 (32)	
Community management							
DELTA health centres	107	20 (19)	45 (42)	107	27 (25)	46 (43)	0,205
Controls	31	6 (19)	17 (55)	31	6 (19)	18 (58)	
Paid/unpaid work							
DELTA health centres	103*	20 (19)	54 (52)	104	23 (22)	56 (53)	0,366
Controls	30*	6 (20)	18 (60)	30	4 (13)	18 (60)	
Household management							
DELTA health centres	94*	0 (0)	61 (65)	87	0 (0)	50 (57)	0,659
Controls	23*	0 (0)	17 (74)	24	0 (0)	15 (62)	
Quiet recreation							
DELTA health centres	107*	26 (24)	43 (40)	107	27 (25)	44 (41)	0,545
Controls	31	8 (26)	12 (39)	31	7 (23)	15 (48)	
Active recreation							
DELTA health centres	107	22 (21)	63 (59)	107	30 (28)	52 (49)	0,763
Controls	31	5 (16)	15 (48)	31	8 (26)	16 (52)	
Socialization							
DELTA health centres	107	25 (23)	47 (44)	107	30 (28)	42 (39)	0,199
Controls	31	5 (16)	13 (42)	31	5 (16)	15 (48)	

The category "no change" is not listed, therefore figures do not end up to 100 %. * Some internal dropouts.

Table 7. Mean numbers of contacts with professionals and organisations in DELTA health centres and control health centres during 12 month after inclusion.

Profession	DELTA centre n=107	Control centre n=31	p
Physician	7,36	5,35	0,050*
Nurse	1,45	2,32	0,015*
Physiotherapist	19,54	8,68	0,000*
Occupational therapist	0,57	0,58	0,606
Social worker	0,76	1,97	0,237
Psychologist	1,12	0,19	0,387
Organisation			
Social insurance office	0,81	0,65	0,187
Employment office	0,13	0,32	0,821
Emergency, primary care	0,12	0,03	0,477
Hospital emergency/day-care	0,21	0,03	0,144
X-ray	1,28	0,26	0,846
Social services office	0,07	0,00	0,222

Table 8. Received treatment by different professionals during the first 6 months after inclusion.

Treatment	DELTA Health centres n=107		Control Health centres n=31		p
	n	%	n	%	
Physician					
Instruction/advice	51	48	14	45	0,807
Medication	82	77	24	77	0,928
Sick leave certificate	64	60	14	45	0,157
Acupuncture	5	5	0	0	0,222
Referral	42	39	12	39	0,957
Other	12	11	1	3	0,182
Physiotherapy					
Instruction/advice	70	65	12	39	0,008*
TNS	25	23	5	16	0,392
Acupuncture	30	28	7	23	0,547
Ultrasound	9	8	4	13	0,453
Relaxation technique	35	33	6	19	0,153
Exercise (MTT)	42	39	7	23	0,089
Exercise in group	37	35	4	13	0,021*
Other	33	31	8	26	0,590
Occupational therapy					
Instruction/advice	5	5	5	16	0,031*
Daily activity exercise	4	4	2	7	0,516
Workplace adaptation	4	4	0	0	0,276
Technical aids	6	6	2	7	0,860
Exercise in group	0	0	3	10	0,001*
Other	2	2	1	3	0,650
Social worker					
Support in crises	3	3	1	3	0,902
Counselling	5	5	6	19	0,008*
Other	4	4	2	7	0,516
Psychology					
Short term therapy	3	3	1	3	0,902
Long term therapy	1	1	0	0	0,590
Other	2	2	0	0	0,445

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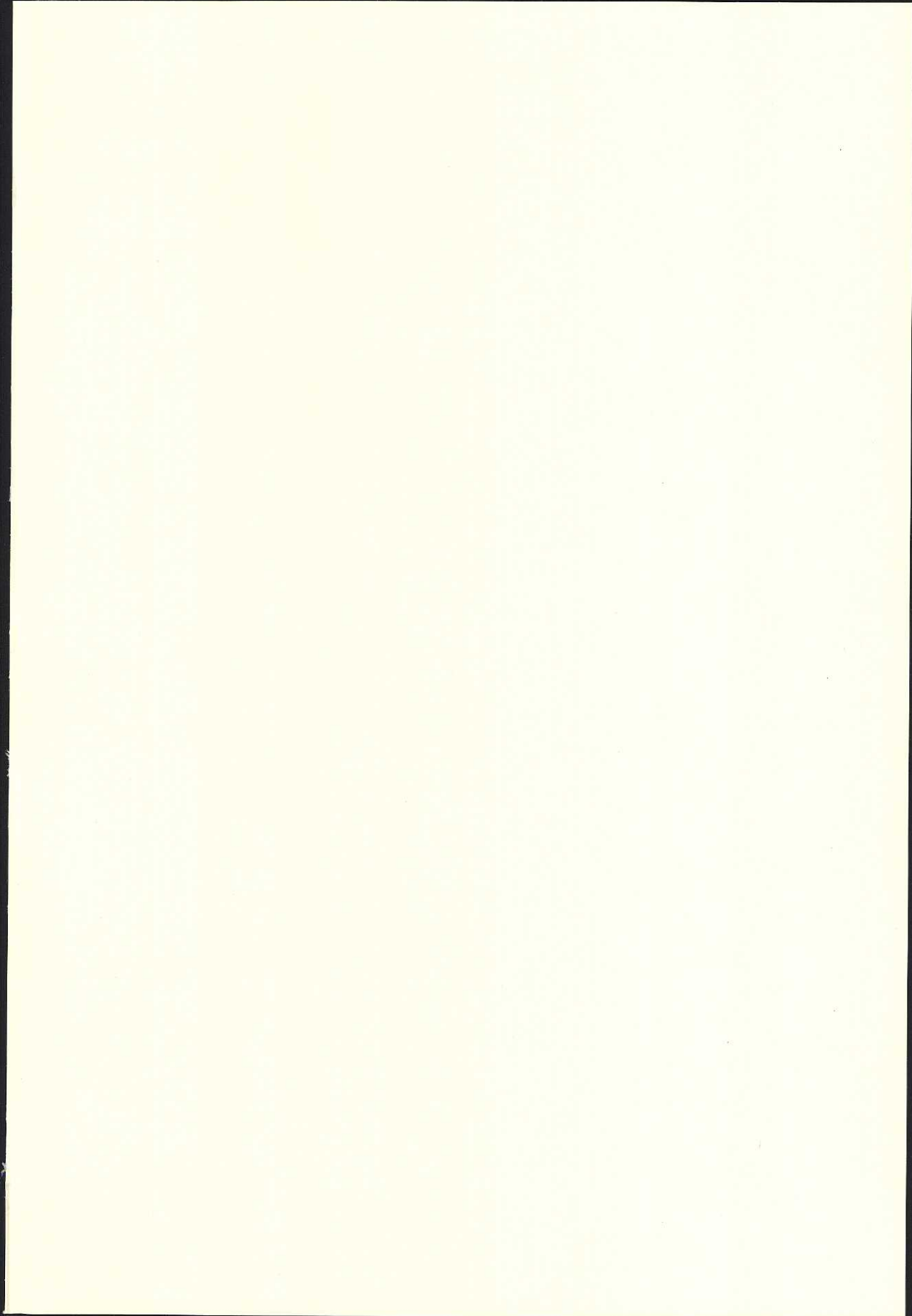
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