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Abstract

Ikonen A. **Primary care visits in the Finnish occupational health services and their connections to prevention and work-related factors.** Helsinki: The Social Insurance Institution of Finland, Studies in social security and health 120, 2012. 161 pp. ISBN 978-951-669-882-6 (print), ISBN 978-951-669-883-3 (pdf).

In Finland, most employers offer primary care for their employees in addition to the preventive occupational health services (OHS). The purpose of this study was to determine the role of OHS in the health care of working persons as well as the relationship between primary care visits to OHS and prevention and work-related factors. The study showed that over 50% of employees used only OHS for primary care and the use of public health care was reduced. Men seemed to favour OHS as a primary health care provider. The proportion of visits to occupational health (OH) physicians was found to have increased compared to other OH professionals. Mental health problems, musculoskeletal disorders, chronic illnesses impairing work ability, and poor work ability were associated with visits to OHS but still about half of the employees with these problems did not use OHS. The role of OH nurses seemed important in detecting insomnia, burnout, and depressive disorders. Work-related symptoms and work ability were found to be frequently examined during OHS primary care visits. Over half of the visits to OH physicians were work-related when the reason for consulting was at least partially due to work or when the need for sickness absence was considered. Workplace harassment and lack of influence on one's work was associated with visits to OH nurses or physicians, indicating that they have the possibility to gain knowledge about work-related factors through primary care visits. Employers' requirements of sickness certificates covering the first day of sickness were associated with visiting OHS among men. The role of supervisors in controlling short sickness absences could be emphasized. Although health promotion and interventions aimed at work were carried out in primary care visits to OH physicians, interventions aimed at workplaces could be increased. In conclusion, OHS primary care contributes to preventive activities and is often interrelated with employees' work and work ability.

Keywords: occupational health services, occupational health physicians, occupational health nurses, office visits, prevention, work-related factors, health services – utilization

Tiivistelmä

Ikonen A. **Sairaanhoitokäynnit osana Suomen työterveyshuoltojärjestelmää sekä niiden yhteydet sairauksien ennaltaehkäisyyn ja työhön liittyviin tekijöihin.** Helsinki: Kela, Sosiaali- ja terveysturvan tutkimuksia 120, 2012. 161 s. ISBN 978-951-669-882-6 (nid.), ISBN 978-951-669-883-3 (pdf).

Suomessa suurin osa työnantajista tarjoaa työntekijöilleen ehkäisevän työterveyshuollon lisäksi sairaanhoitopalveluja. Tämän tutkimuksen tarkoitus oli selvittää työterveyshuollon asemaa työssä käyvien terveydenhuollossa ja työterveyshuollon sairaanhoidon yhteyttä ennaltaehkäisyyn ja työhön liittyviin tekijöihin. Tämä tutkimus osoitti, että yli 50 % työntekijöistä käytti pelkästään työterveyshuollon sairaanhoitoa ja julkisen terveydenhuollon käyttö väheni. Erityisesti miehet näyttivät sairastuessaan valitsevan työterveyshuollon. Työterveyshuollossa lääkärissäkäyntien osuus nousi verrattuna muuhun työterveyshenkilöstöön. Tuki- ja liikuntaelinsairaudet, mielenterveysongelmat ja pitkäaikaiset työkykyyn vaikuttavat sairaudet olivat yhteydessä sairaanhoitokäynteihin työterveyshuollossa, mutta noin puolet niistä, joilla oli näitä ongelmia, eivät käyneet työterveyshuollossa. Työterveyshoitajan rooli näytti tärkeältä unettomuuden, työuupumuksen ja masennuksen havaitsemisessa. Työperäisiä oireita ja työkykyä arvioidaan usein työterveyshuollon sairaanhoidon yhteydessä. Yli puolet työterveyslääkäreillä käynneistä olivat työhön liittyviä, kun käynnin syy oli ainakin osittain työn aiheuttama tai kun sairausloman tarve otettiin huomioon. Epäasiallinen kohtelu työpaikalla ja vähäiset mahdollisuudet vaikuttaa omaan työhön olivat yhteydessä työterveyshoitajalla tai -lääkärissäkäynteihin. Tämä osoitti, että työterveyshuollon henkilöstöllä on mahdollisuus saada tietoa työhön liittyvistä tekijöistä sairaanhoidon yhteydessä. Vaatimus sairauslomatodistuksesta ensimmäisestä sairauslomapäivästä lähtien liittyi työterveyshuollon käynteihin miehillä. Lyhyiden sairauslomien seurannassa voitaisiin lisätä esimiesten roolia. Vaikka terveysneuvontaa ja työhön kohdistuvia interventioita tehtiin sairaanhoidon yhteydessä, työpaikkoihin kohdistuvien interventioiden määrää voitaisiin lisätä. Sairaanhoito työterveyshuollossa tukee ennalta ehkäisevää työtä ja usein liittyy työntekijöiden työhön ja työkykyyn.

Avainsanat: työterveyshuolto, työterveyslääkärit, työterveyshoitajat, vastaanottokäynnit, ennaltaehkäisy, työhön liittyvät tekijät, terveyspalvelut – käyttö

Sammandrag

Ikonen A. **Primärvårdsbesök inom den finländska företagshälsovården och deras samband med förebyggande och arbetsrelaterade faktorer.** Helsingfors: FPA, Social trygghet och hälsa: Undersökningar 120, 2012. 161 s. ISBN 978-951-669-882-6 (hft.), 978-951-669-883-3 (pdf).

I Finland erbjuder de flesta arbetsgivare sjukvårdstjänster för sina anställda utöver förebyggande företagshälsovårdstjänster (FHVT). Syftet med detta arbete är att utreda rollen av FHVT i yrkesarbetande personers hälsovård samt att utreda sambandet mellan sjukvårdsbesök hos FHVT och förebyggandet och arbetsrelaterade faktorer. Denna studie visar att över 50 % av anställda endast använde FHVT som serviceproducent för sjukvård och användningen av offentlig hälsovård minskades. I synnerhet verkade män föredra företagshälsovården vid insjuknande. Andelen besök hos företagsläkare ökade jämfört med besök hos andra företagshälsovårdsexperter. Sjukdomar i det muskuloskeletala systemet, problem med mental hälsa och kroniska sjukdomar som försvagar arbetsförmågan sattes i relation till sjukvårdsbesöken hos företagshälsovården, men ungefär hälften av dessa patienter anlitade ändå inte FHVT. Företagshälsovårdarens roll verkade vara viktig då det gällde att hitta insomni, burnout och depression. Arbetsrelaterade symptom och arbetsförmåga undersöktes ofta under primärvårdsbesök hos FHVT. Över hälften av besöken hos företagsläkarna var arbetsrelaterade när orsaken för besöket åtminstone delvis berodde på arbetet eller när behovet av sjukskrivning var nödig. Mobbning på arbetsplatsen samt brist på möjligheter att påverka det egna arbetet relaterades till besök hos företagshälsovårdare eller företagsläkare. Detta bevisar att de har möjlighet att få kunskap om arbetsrelaterade faktorer i samband med sjukvårdsbesök. Arbetsgivarnas krav om sjukledighetsintyg från och med första dagen av sjukdomen relaterades till männens besök hos FHVT. Arbetsledarnas roll i att kontrollera korta sjukledigheter skulle kunna ökas. Även om hälsorådgivning och åtgärder som hänför sig till arbetet gjordes i samband med sjukvård, kunde åtgärder relaterade till arbetsplatserna ökas. Företagshälsovårdens sjukvård stöder det förebyggande arbetet och har ofta samband med de anställdas arbete samt arbetsförmåga.

Nyckelord: företagshälsovård, företagsläkare, företagshälsovårdare, mottagningsbesök, förebyggande, arbetsrelaterade faktorer, hälsovårdstjänster – användning

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Espoo, January 2012

Annukka Ikonen

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II **Ikonen A, Räsänen K, Manninen P, Rautio M, Husman P, Ojajärvi A, Alha P, Husman K.** Use of health services by Finnish employees with impaired health or health risks. The population-based Health 2000 study. Submitted in the International Archives of Occupational and Environmental Health.

III **Kimanen A, Manninen P, Räsänen K, Rautio M, Husman P, Husman K.** Factors associated with visits to occupational health physicians in Finland. Occup Med 2010; 60: 29–35.

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V **Ikonen A, Räsänen K, Manninen P, Rautio M, Husman P, Ojajärvi A, Husman K.** Work-related primary care visits to occupational health physicians. J Occ Rehabil. Published online: 30 July 2011 DOI 10.1007/s10926-011-9325-1.

Annukka Ikonen (formerly Kimanen)

ABBREVIATIONS

BDI	Beck Depression Inventory
BMI	body mass index
CIDI	Composite International Diagnostic Interview
DSM-IV	Diagnostic and statistical manual of mental disorders IV
FIOH	Finnish Institute of Occupational Health
GP	general practitioner
HC	health centre
Kela	Kansaneläkelaitos (Social Insurance Institution of Finland)
MBI-GS	Maslach Burnout Inventory-General Survey
MDD	major depressive disorder
MSD	musculoskeletal disorder
OECD	Organisation for Economic Co-operation and Development)
OH	occupational health
OHC	occupational health care
OHS	occupational health services
Stakes	Sosiaali- ja terveysalan tutkimus- ja kehittämiskeskus (National Research and Development Centre for Welfare and Health)
STM	Sosiaali- ja terveysministeriö (Ministry of Social Affairs and Health)
THL	Terveyden ja hyvinvoinnin laitos (National Institute of Health and Welfare
WHO	World Health Organization

1 INTRODUCTION

Occupational health services (OHS) play a key role in the health care of Finland's working population. Based on the Occupational Health Care Act of 1978, employers have been obliged to organize preventive occupational health care (OHC) for all employees. In addition, employers can voluntarily offer primary care and other health care services for employees (Occupational Health Care Act 1978). OHS primary care, also called curative care or illness-related care, means medical treatment of employees' health problems at the general practitioner (GP) level. OHC was originally based on the primary care organized by large employers at the end of the 19th century. Before legislation passed in 1978, a considerable number of employees already received primary care arranged by employers. Kela's financial reimbursement system for employers was stipulated by law to support the objectives of the Occupational Health Care Act (Sickness Insurance Act 1963). Since 1979, OHC coverage has increased and today is among the highest in Europe (Rantanen et al. 1999; Hämäläinen R 2008). In 2006, the coverage for employer-arranged OHS for employees was 92%, and for these employees the coverage for primary care was 91% (Kauppinen 2007). In 2009, the coverage was 93%, and the percentage for primary care was 92% (Perkiö-Mäkelä et al. 2010).

OHS tasks vary between countries, and comparisons between different OHS systems are difficult. Along with preventive tasks, in Finland and Italy primary care can be included in OHS. In some countries supplementary provision of curative services might be agreed with the client enterprises (Belgium, Denmark, Germany, the Netherlands, and Sweden) or can be arranged on a contractual basis, with OHS assisting employers in providing care (France, Germany, and Portugal) (Hämäläinen R 2008). In the Netherlands and Japan, mainly large companies offer curative services (Muto 2007; Weel and Plomp 2007; Plomp 2008). First aid is included in the tasks of OHS in Austria, Germany, Greece, and Spain (Froneberg 2007; Hämäläinen R 2008). In Norway and Denmark, legislation allows OHS to provide curative services targeted at work-related disorders (Lie and Bjornstad 2007; Kabel 2007). Recently in the U.S., interest in integrating primary care with OHS has intensified (Griffith and Strasser 2010; Tu et al. 2010).

In Finland, in addition to strengthening preventive activities, employer-arranged primary care has been considered important in supporting employees' health, work ability, and wellbeing at work during one's entire working life (STM 2004). A considerable amount of visits are made to OHS professionals every year for primary care. In 2008, the total number of visits to OHS was 6.3 millions, of which 84% was for primary care (Kela 2010a). The total number of visits in 2007 to primary health care in public and private sectors (excluding dental care and hospital outpatient clinics) was about 40 million (Stakes 2008; THL 2010). Thus about every seventh visit was made to OHS.

According to Finnish government guidelines for good practice in the OHS, primary care emphasizing occupational health has the following special features: 1) taking ac-

count of the needs of employees and enterprises in arranging primary care, 2) assessing the work-relatedness of health problems, 3) supporting work ability and functional capacity by intervening in work, working conditions, and work communities, 4) assessing work ability, 5) referring to rehabilitation, 6) counselling about health hazards at work, 7) taking account of work requirements in treatments and in returning to work, and 8) preventing impairment by work-related diseases (Manninen 2007). According to the World Health Organization (WHO), curative care in the OHS differs from common practice by considering how the patients' symptoms are related to their work. This may draw attention away from prevention, but it can be an essential part of OHS, and closely related to its main aim (WHO 2002). As primary care is voluntary for employers, the agreements on the content of primary care may vary between employers. The content of primary care should be the same for all personnel and it must be free of charge.

Enhancing and maintaining employees' work ability and focusing on preventive activities in workplaces were the grounds for reforming the compensation system in 1995 and for the Occupational Health Care Act in 2001 (Government Resolution 1994; The change of Sickness Insurance Act 1994; Occupational Health Care Act 2001). The lengthening of work careers has recently been emphasized and this makes it necessary to focus on the content and activities of OHS so that they might better contribute to these goals (STM 2005, 2011a and 2011b; Lamberg et al. 2007). Health promotion, the recognition of lowered work ability as well as rapid diagnosis, treatment, and rehabilitation are considered to be the strengths of OHS in Finland (Lamberg et al. 2007). These tasks can be carried out also through primary care in the OHS. Special emphasis has been placed on improving the early detection of lowered work ability and the functioning of service chains (Lamberg et al. 2007). The change of reimbursement by law will support this aim, and as for the higher reimbursement it will be required that workplaces have models for the management of employees' work ability (The change of Sickness Insurance Act 2010).

OHS provide primary care for a majority of the working population in Finland. Primary care through OHS is particularly expected to support the work ability of employees. This is characterized by possibilities to promote the health of workers as well as healthy working conditions by direct contacts with workplaces. The increase of the coverage of primary care in the OHS has aroused concern about the expenses and inappropriate division of work between OH nurses and OH physicians and the emphasis on OHS moving from preventive services to primary care. The aims of this study are to determine the position OHS primary care in overall Finnish health care and how the characteristic features OHS primary care have been achieved in relation with work, work ability, health risks, preventive activities, and interventions.

2 REVIEW OF THE LITERATURE AND CONCEPTS

2.1 Occupational health services (OHS) in Finland

2.1.1 Overview

The development of Finnish occupational health services began at the end of the 19th century in industrial companies mainly by offering primary care to personnel and their families. Since the 1960s, OHS have been developed systematically, at first on the basis of agreements between labour market organizations and later by legislation (Lamberg et al. 2007).

OHS in Finland expanded considerably after the 1978 legislation. At that time, the employee coverage was approximately 60% (STM 1989). Coverage for primary care in OHS has increased from over 80% in 2000 to 93% in 2009, as shown in representative population-based surveys based on telephone interviews of the working population conducted by the Finnish Institution of Occupational Health (FIOH) (Piirainen et al. 2000; Kauppinen 2010). In a survey based on mailed questionnaires to OHS units, coverage figures were slightly lower in 2007. In the same survey, occupational health care encompassed 1.87 million people, of which 1.82 million were employees, and the rest self-employed (Manninen 2009). According to the statistics of Kela, 1.88 million employees were covered by OHS and 1.73 million (92%) received primary care in OHS in 2008 (Kela 2010a). The OHS coverage percentages vary due to the different measurement methods.

Based on the 1963 legislation, employers are partly reimbursed by Kela for the costs of organizing OHS (Sickness Insurance Act 1963). At first it meant compensating part of the costs of arranging primary care for employees, and since 1969 certain preventive services. Following the 1978 legislation the expenses of both preventive and curative services were partly compensated for employers. The current general principles and directives for OHC are defined in the current occupational health care legislation (Occupational Health Care Act 2001) and in the Government Decree of 2001 on the principles of good OHC practice, the content of OHC, and the qualifications of OH professionals and experts (Government Decree 2001).

2.1.2 Activities and tasks of OHS

The Occupational Health Care Act defines the tasks of OHS. The purpose of the law is to help prevent work-related illnesses and accidents, and to promote the health and safety of work and the work environment, employees' health, work ability and functional capacity at all stages of working lives, as well as the functioning of work communities through cooperation between employers, employees, and the OHS provider. In addition, employers can offer primary care and other health care to employees. Since the change in legislation in 2005, entrepreneurs and the self-employed are also able to arrange primary care for themselves, and are entitled to be compensated for it.

The goal of extending working lives will place new demands on OHS. Enhancing work ability as well as employees' continuing at work will be emphasized as the main goals in OHS (STM 2004 and 2011b). Employers' action plans for early support of functional capacity and taking care of employee work ability, as well as supporting employees to return to work after sickness absence are linked to the higher level of reimbursements for preventive activities for employers from the beginning of 2011 (The change of Sickness Insurance Act 2010). This change, and the plans to require the opinion of an OH physician on employee's work ability after 90 days of sick leave will reinforce the managing and monitoring of work ability in workplaces. It will give new responsibilities to OHS in collaboration with workplaces.

The Occupational Health Care Act stipulates monitoring of the quality and efficacy of OHS. Over 90% of OHS providers have been found to monitor the efficacy of their activities and 60% monitor the quality of OHS (Manninen 2009). The Ministry of Social Affairs and Health (STM) is currently monitoring OHC nationwide with three surveys every third year conducted by the FIOH (Lamberg et al. 2007). These surveys include Work and Health Surveys, surveys of OHS in Finland, and the Maintenance of Work Ability barometer. Kela publishes annual reports on OHC reimbursement statistics which cover information on activities and expenses. The results of these surveys and reports are important sources for outlining the development of OHS nationally.

OH physicians and OH nurses bear the main responsibility for primary care in OHS along with preventive measures. In addition, general practitioners and other nurses may provide medical services. Physiotherapists and psychologists participate in treatment to some extent at the request of OH professionals. OH physicians may consult other specialist physicians in assessing possibilities for treatment as well as work ability. The WHO document on the role of OH nurses in Europe describes OH nurses' work in primary care in OHS: it may comprise primary prevention, emergency care, treatment services, and planning (Whitaker and Baranski 2001). In Finland, the education of a public health nurse which includes earning a nursing degree before specializing as an OH nurse provides a basis for primary care. The activities of Finnish OH nurses have changed from an individual and medicinal orientation to working with work communities and nursing (Naumanen-Tuomela 2001). However, OH nurses consider skills in primary care to be important. They also consider that information from workplaces received through primary care enables comprehensive care (Kyrönlahti 2005).

A significant proportion of OH physicians' work in Finland consists of primary care (Räsänen et al. 1990; Naumanen and Liesivuori 2007). In many countries OHS primary care is restricted. In the Netherlands, OH physicians have been shown to use half of the working hours on guidance of workers on sick leave (Moriguchi et al. 2010). In the same study, Japanese OH physicians did mainly preventive work, with 9% of their working hours used for mental health care. In the USA, three distinct groups of OH physicians have been identified. Their orientation was towards injury care, other

clinical work, or management. Most of the work of physicians orientated to injury care, is in the area of treatment (Harber et al. 2010).

In 1989, 32% of Finnish OH physicians' work time was for primary care, 11% for health check-ups, 7% for workplace surveys, 4% for other preventive work, and 46% for other work (Räsänen et al. 1990). In employer-owned and other OHS units over 46-49% of the work time was for primary care, with the lowest proportion (10%) being found in municipal health centres. Other work analyses from 2005 have shown that of OH physicians' work time, 64% was spent on employee-oriented tasks and 7% on workplace visits (Naumanen and Liesivuori 2007). OH physicians recorded significantly more time on employee-oriented tasks in private medical centres. Of the respondents, 43% reported that 76–100% of their work time was spent on employee-oriented tasks. A distinction concerning employee-oriented tasks between primary care and health check-ups was not made in the study.

In the same work analyses, Finnish OH nurses were found to have carried out more preventive work and workplace visits than OH physicians. In 1989, 8% of the weekly work time of OH nurses was for primary care, 25% for health check-ups, 8% for workplace surveys, 5% for other preventive work, and 54% for other work (Räsänen et al. 1990). In the employer-owned OHS units the time used for primary care was highest (18%) and in the OHS units of municipal health centres it was lowest (3%). Another work analysis of Finnish OH professionals in 2005 showed that about 55% of the work time of OH nurses was spent on employee-oriented tasks and 12% on workplace visits (Naumanen and Liesivuori 2007).

According to reimbursement statistics from 2008, the total number of employees' visits to OHS was 6.27 million, of which 5.25 million (84%) were for primary care. Of these primary care visits, 64% were to physicians, 26% to nurses, 6% to physiotherapists, 3% to specialist consultants, and less than 1% to psychologists. Of all visits to physicians (for primary care or health check-ups) 93% were primary care visits, and 69% of visits to nurses were primary care visits (Kela 2010a).

2.1.3 OHS personnel

According to the Occupational Health Care Act, employers must use OH professionals in planning, implementing, developing, and monitoring the activities of OHC so that it will be organized in accordance with good practices of OHC. OH professionals may consult other experts on these tasks. OH professionals must be independent in their work and must be fully qualified.

OH professionals are by definition occupational health care specialists or other licensed physicians having OHC education and qualified public health nurses have the necessary training for OHC (Government Decree 2001). In 2008, over 1300 OH physicians and over 2000 nurses worked full-time in OHS, and the total number of physicians

and nurses in OHS were about 5000. Over 90% of public health nurses were fully qualified in OHC, and two-thirds of physicians working in OHS had the required education in OHC. Of full-time OH physicians, 55% had specialized in OHC, and in employer-owned OHS units the proportion was the highest (72%). The proportion of full-time OH physicians in OHS was 58%. Physicians working part-time in OHS were less qualified. Over 90% of OH nurses worked full-time (Manninen 2009).

Other occupational health care experts are physiotherapists, psychologists, or experts in occupational hygiene, ergonomics, technical issues, agriculture, occupational vision, nutrition, speech therapy, and physical education with sufficient knowledge of OHC. Specialist physicians in an area other than OHC may also act as OHC experts in assessing work ability (Occupational Health Care Act 2001; Government Decree 2001). The resources and qualifications of OH professionals per numbers of clients vary between providers. Further, municipal health centres lack OH physicians. In 2007, the median of clients per OH physician in municipal OHS was over 2600, whereas in private OHS clinics it was 1200. The medians of clients per OH nurses varied less, although the highest medians were in municipal health centres (875 clients / OH nurse) and lowest in employer-owned OHS units (452 clients / OH nurse) (Manninen 2009).

2.1.4 Provision of OHS

Employers may organize OHS in a variety of ways. They can have an employer-owned OHS unit, a joint OHS unit with other employers, or they can purchase services from another employer having an OHS unit, from OHS units in municipal health centres or municipal public-service companies, or from private OHS clinics. In recent years the trend has been to purchase OHS from private OHS clinics. The number of clients of private OHS clinics has increased by 200 000 from 2005 to 2007. Large employers have outsourced the provision of OHS and also the numbers of employees in municipal OHS units have decreased. In 2007, private OHS clinics provided services to 48% of employees, municipal OHS units to 32%, employer-owned OHS units to 15%, and joint OHS units to 5% (Manninen 2009). In 2008, primary care in OHS was provided for 1.73 million employees, of which 45% received services in private OHS clinics, 24% in municipal OHS units, 17% in employer-owned OHS units, and 7% in joint OHS units (Kela 2010a).

The municipal OHS system is being reorganized by regional collaboration between municipalities and by founding public-service companies (Pulkkinen-Närhi et al. 2004). These companies provided OHS to 25% of municipal sector clients in 2007 (Manninen 2009) and to two-thirds of municipal sector clients at the end of 2009 (unpublished data, Manninen 2011). In the public sector the 1994 legislation allowed municipalities to charge employers for the real cost of providing OHS (Government decree 1992 and 1994). In the private sector industries have focused on their main businesses and have outsourced OHS units mainly to private OHS clinics.

Providing primary care through OHS and the OHS model have affected the use of health care. In 1991, OHS arranged in the OHS units of private medical centres and regional OHS units of the state increased physicians' visits to persons aged 25–64 years (Räsänen et al. 1993). Employer coverage of health care has been significantly associated with visits to physicians among adults aged 18–64 (Häkkinen 2002). A study on the opinion of health services among persons aged 15 years or more in the region of Kanta-Häme showed that the main reason for choosing health services was distance (31% of respondents), fees (21%), shorter waiting times (15%), and good quality of care (12%) (Kukkola et al. 2005).

Accessibility has been found to be an important factor in the utilization of OHS in the Netherlands (Plomp 1996). In one Dutch study, other arguments in favour of consulting an OH physician included proximity and the ability to influence working conditions (Plomp 1998). The possibility to choose appointment times has been important for those who work (Rubin et al. 2006). In Finland, the access to care assessed by respondents who used health services was reported as good for 78% using the private sector, 68% using OHS, and 35% using public health centres (Mäntyselkä et al. 2007).

2.1.5 Reimbursement of OHS expenses

The legislation concerning reimbursement was changed in 1994. According to changes in the Sickness Insurance Act, OHS primary care would be organized so that it supports the maintaining of work ability. The reform of the reimbursement system in 1994 divided reimbursement into two categories of expenses, category I for preventive OHS and category II for curative services (Government Resolution 1994). The reform reduced reimbursements of the expenses of clinical specialists and abolished reimbursements for the health care of family members. The necessary and reasonable expenses of primary and other health care are reimbursed providing that they are free of charge for employees. The reimbursements are financed not by taxation but by the National Health Insurance programme (earned income insurance) contributed to by employees and employers.

The level of reimbursement is defined by the resources which are needed at general practitioner (GP) level, including expenses of personnel and tests, and other costs of running OHS. In 1978, the level of reimbursement was 60%, in 1988 it was reduced to 55%, and in 1992 to 50%. In 1994, a maximum limit per employee was introduced in both categories and the level of the limit was to be defined annually. Under that limit, 50% of primary care expenses are compensated. In 2001, the level of reimbursement for category I was raised to 60% for activities focused on workplaces and in 2006 for all category I expenses (The Change of Sickness Insurance Act 2001). At the beginning of 2011, a new prerequisite of 60% reimbursement came into effect (The Change of Sickness Insurance Act 2010). Employers, employees, and OHS must establish collaborative practices to monitor and support the work ability of employees.

In 2008, the expenses of OHS accepted for reimbursement were 562 million euros, of which 350 million euros (62%) were for the primary care expenses (category II). The proportions of expenses for primary care varied by providers as follows: municipal health centres 56%, employer-owned OHS units 59%, OHS units of another employer 58%, joint OHS units 62%, private OHS clinics 66%, and other OHS units 64% (Kela 2010a).

2.1.6 Primary care in OHS

An essential feature of primary health care services is direct access to care. In Finland, this kind of primary health care is provided by municipal health centres, OHS, and private physicians. In OHS, a large proportion of operations is the treatment of common diseases by OH physicians and OH nurses. In the private sector, most of the services are provided by specialist physicians, but the nature of the health problems is mainly such that they can be included in primary health care (Kokko 2007). OHS are an important part of the primary health care system in Finland, as OHS handle almost half of all physician visits for primary care for the working population (Räsänen 1998; Manninen et al. 2007; Perkiö-Mäkelä et al. 2010).

OHC good practices define the tasks of primary care in OHS. OHS should take account of the needs of employees and enterprises in arranging primary care. Primary care includes assessing the work-relatedness of health problems; assessing and supporting work ability and functional capacity by intervening work, working conditions, and work communities; referring for rehabilitation; and counselling about health hazards at work. OHS should take account of requirements at work in treatments and when individuals return to work (Manninen 2007). Through primary care, OHS personnel can detect needs for improvements in workplaces and the rehabilitation of employees (Manninen et al. 2007).

Traditionally primary care in OHS has played a significant role in the activities of Finnish OHS. Primary care was considered to be relevant because through employees' symptoms and morbidity OHS could also detect work-related symptoms and diseases. At the beginning of the 1990s preventive activities and maintaining work ability at workplaces became emphasized as the main objectives of OHS. However, primary care through OHS was still considered important because it reached the working population more effectively than public primary health care. It was considered necessary that primary care be organized so that it would support the maintenance of work ability, and be flexible and meet without delay the needs of the working population (Government Proposal 1994).

The guidance for good practice in OHS primary care gives more detailed recommendations (STM and FIOH 2010). It emphasizes the OHS's role of coordination and guidance in the process of treating work-related illnesses and the promotion of work ability. Contrary to usual health care, OHS have the possibility to influence

workplaces in order to improve working conditions and support work ability. During primary care visits OH professionals receive current information from workplaces which complements the information received from workplace surveys and health check-ups. The change of the Sickness Insurance Act, in addition to increasing the cooperation of workplaces, employees, and OHS in promoting employees' work ability, could strengthen OHS primary care to guide and coordinate the process of treating work-related health problems regardless of the provider of treatment (The change of Sickness Insurance Act 2010; Government Proposal 2010).

Primary care which is focused on occupational health has special features and strengths. OH personnel have a knowledge of the relationship between work and health. Contacts for primary care enhance the possibilities to prevent and to detect threats to work ability at early stages. The efficient and high-quality primary care given in OHS can contribute to good treatment and prognosis, and returning work ability (Government Proposal 2001). In a study of the maintenance of work ability in workplaces, primary care in OHS was found to strengthen the activities of OHS in the preventive maintenance of work ability (Peltomäki et al. 2000).

Statistics on the use of primary health care in the Finnish working age population are available from several sources. The National Institute for Health and Welfare (THL) keeps statistics on visits to health centres and private health services, and Kela keeps statistics on reimbursements of the expenses of OHS to employers.

The most useful statistics describing the use of primary care in OHS are those of Kela, as they provide information on both preventive activities and primary care based on the applications of employers. In 2008, employers offered mandatory OHC for 1.88 million employees, and access to employer-arranged primary care in OHS was for 1.73 million employees. In the same year, 5.2 million visits were made for primary care in OHS and 1 million visits for health check-ups. OH physicians performed 0.26 million health check-ups, OH nurses 0.61 million, and the rest were done by physiotherapists, psychologists, specialist physicians, and other experts. The proportion of visits for primary care to physicians was 64% (3.3 million), to nurses 26% (1.4 million), to physiotherapists 6% (0.3 million), and to specialist physicians 3% (0.2 million). In 2008, 6.5 million laboratory tests and 0.45 million radiological tests were carried out for primary care (Kela 2010a).

The use of physician services has been studied in nationally representative Finnish Health Care Surveys of the total non-institutionalized population in 1987 and 1996 (Häkkinen 2002). In 1996, 49% of all physician visits took place in health centres, 20% in hospital outpatient clinics, 18% in the private sector, and 13% in OHS.

Use of health care has been measured in several surveys by self-reports. In 1991, half of the employees reported that they visited always or almost always their OHS unit when in need of primary care (Räsänen et al. 1993). The mean number of visits to physicians was 1.4 per person in the preceding six months. The number varied from 1.1

for those who had no OHS arranged to 1.9 for the population not at work. This survey showed that the adult Finnish population uses all the alternative health services, but there was no evidence that OHS would increase the overall use of physicians' services.

Several studies of health care use suggest that women use more health care services than men (Räsänen et al. 1993; Green and Pope 1999; Lahelma et al. 1999; Ladwig et al. 2000; Parslow et al. 2004a). Women also report more symptoms, but gender differences in health care use have been found to be independent of symptom perception (Ladwig et al. 2000). The Finnish Work and Health Surveys and the Health 2000 study have measured health care use by gender.

The Work and Health Surveys have measured health care use by telephone interviews from 1997 every third year. The number of visits of the working population aged 20–64 years to physicians in 2009 was found to be two within the last six months: 0.9 (45%) to OH physicians, 0.5 (25%) to health centre physicians, 0.3 (15%) to private physicians, 0.3 (15%) to physicians at hospital out-patient clinics, and 0.1 (5%) to other physicians. Women aged 25–34 years visited physicians the most (2.8 visits). Men visited OH physicians on average 0.8 times and women once (Perkiö-Mäkelä et al. 2010). The numbers of visits to OH physicians increased from 0.6 visits in 1997 to 0.9 in 2009 (Kauppinen 2010).

In the Health 2000 study, the average annual number of physician visits of general population aged 30–64 due to an illness was found to be 3.1 (2.4 visits for men and 3.6 for women) during the preceding twelve months (Aromaa and Koskinen 2004). The number of visits to OH physicians was found to be 0.6 for men and 0.8 for women, to health centre physicians 0.9 for men and 1.3 for women, to private physicians 0.4 for men and 0.7 for women, and to physicians at hospital out-patient clinics 0.5 for men and 0.6 for women. The proportion of those having visited an OH nurse was 21.2% for men and 21.7% for women, and 27% of working-age respondents reported that they would first contact a nurse in OHS if they needed help from a nurse. The primarily contacted physician was an OH physician for 28.9% of men and 27.3% of women.

The OHS surveys in Finland report use of OHS according to the information gathered from OHS providers. The median of visits to OH physicians for primary care was 1.52 per client in 2007 (Manninen 2009). Visits varied according to the provider, the highest number (1.79) being in the joint-model OHS units and the lowest (1.36) in OHS units in municipal health centres.

Another Finnish study found that working respondents visited a physician (a health centre physician, an OH physician, or a private physician) 2.9 times a year, of which 1.31 visits (45%) were to OH physicians, 0.98 visits (34%) to health centre physicians, and 0.71 visits (24%) to private physicians (Virtanen et al. 2006a). Eighty-four percent of the working population had visited a physician in the past twelve months. In another Finnish study, of the population aged 15–74 years, 69.8% had visited health centre physicians, 35.3% OH physicians, 45% private physicians, and 38% the outpatient

clinics of hospitals (Mäntyselkä et al. 2005). Of the working respondents, almost half had visited OH physicians.

2.2 Connections between health problems / health risks (lifestyle factors) and primary care visits

2.2.1 Health problems in OHS

OHS primary care is not restricted according to disease categories, but should particularly cover examinations and treatment for work-related diseases (Government Proposal 1994). Several studies have found various aspects of health the most important factors explaining health care use: self-rated poor health, chronic diseases, pregnancy, depression, insomnia, physical and mental symptom levels (Räsänen et al. 1993; Ladwig et al. 2000; Häkkinen 2002; Parslow et al. 2004b). Attitudinal and behavioural factors have also predicted health care use (Campbell and Roland 1996; Green and Pope 1999; Frostholm et al. 2005).

In a study analysing the work of Finnish OH nurses and OH physicians in 1989, the main reasons for primary care consultations were looked at (Räsänen et al. 1990). MSDs and respiratory diseases were found to be the main reasons for visits to the both OH professionals. In the study, 4115 visits to OH nurses were analysed. MSDs were the reason for a visit in 23% of visits to OH nurses; respiratory diseases in 18%; problems of the nervous system, eyes or ears in 13%; circulatory system problems in 10%; gastrointestinal system problems in 9%, and skin problems in 9%. The most common reasons for primary care visits to OH nurses were fever, elevated blood pressure, cough, back problems and throat symptoms. OH nurses referred 25–35% of their patients to physicians, mainly OH physicians.

The same study found that the main reasons for 2881 visits to OH physicians were musculoskeletal in 33% of visits, respiratory in 17%, and cardiovascular in 8%. Traumas were the main reason for 11% of visits (Räsänen et al. 1990). Problems of the nervous system, eyes or ears and various other symptoms were the main reasons in 6% of visits. In 1989 mental health problems were the main reason for only 2% of visits to OH physicians.

Another Finnish study of 971 visits to OH physicians in 1995 found that 39% of visits were for MSD, 17% for respiratory, 11% for cardiovascular, 9% for dermatological, and 7% for mental disorders (Martimo et al. 2007). More recent studies of the reasons for primary care visits to OHS could not be found. In comparison, the reasons of visits to municipal health centre physicians were analysed from 20 648 visits in 1995. Of all visits, 13–15% were made for musculoskeletal, 13–14% for respiratory, 9% for cardiovascular, and 2% for mental health problems (Pärnänen et al. 2001). Musculoskeletal and mental reasons seem to be more prominent in OHS compared to municipal health centres.

2.2.2 Musculoskeletal health problems

A Canadian study showed close to one-quarter of the study population of seven provinces making at least one visit to a physician for a MSD (Power et al. 2006). A Dutch study showed a GP being sought by 44% of scaffold company workers with low back pain, a physiotherapist by 22%, an occupational physician by 20%, and a clinical specialist by 11% (Molano et al. 2001). In another Dutch study on the use of care for acute and chronic low back pain, 4% nursing home workers visited OH physicians for acute low back pain and 25% for chronic low back pain. The main caregiver was a GP (IJzelenberg and Burdorf 2004). In another Canadian study, work-related MSDs were found to have increased public-funded health care contacts significantly (Koehoorn et al. 2006). Trends for higher utilization among those with work-related MSDs, compared to those without, were detected for GPs, specialists, chiropractors, physiotherapist, and massage therapists.

Mental health problems and MSDs are the main disease groups which cause disability and sickness absence in Finland (Eläketurvakeskus 2010; Kela 2010b). The prevalence of clinically diagnosed MSDs among working people in the Finnish Health 2000 Study was 18.6% (Kaila-Kangas 2007). The prevalence of low back syndrome was 7.8%, neck syndrome 4.4% and shoulder syndrome 3.9%. Of men with some musculoskeletal problem, 16% had visited a physician during the past 12 months.

MSDs have been the main reason for visiting health centre (HC) physicians in 8% of 15–24-year-old patients to about 20% of 25–64-year-old patients (Pärnänen et al. 2001). Another study of health centres showed that one third of 45–54-year-old patients had MSDs as a reason to visit HC physicians. The percentage was greatest (37%) for women aged 55 to 64 years (Rekola et al. 1993). In OHS, 33% of the patients visiting OH physicians had MSDs as the main reason for visiting in 1989 (Räsänen et al. 1990), and 39% in 1995 (Martimo et al. 2007).

2.2.3 Mental health problems

In a European study GPs were shown to be generally the first health professionals contacted by patients with psychosocial problems. However, large differences were found between health care systems (Boerma and Verhaak 1999). In a cross-sectional national survey of general practice in the Netherlands, 10% of the visits were for psychosocial problems, 22% for somatic reasons with a psychological background, and 68% for somatic reasons (Zantinge et al. 2005). In a Dutch study of a working-age population 63.8% of the individual with mood disorders were found to have received some form of care, 53.9% from primary care (Bijl and Ravelli 2000). In a study of factors predicting the seeking of help from OH physicians or GPs, mental health problems and at least one chronic condition predicted visiting both physicians, and fatigue predicted visiting OH physicians (Andrea et al. 2004). However, a higher percentage of employees with fatigue visited GPs than OH physicians (Andrea et al. 2003). In a study of depression

outcomes in primary care in six countries, increased health care use and lost work days were associated with higher depressive symptom scores (Herrman et al. 2002).

In Finland, the proportion of mental disorders as a reason for sickness absence and disability pensions has increased in recent years (Salminen 2004). Close to a third of those with a depressive disorder had a period of sickness absence longer than nine days in the past two years (Ahola et al. 2009a). A Finnish study of the main reasons for visiting HC physicians in municipal health centres, found that only 1.5–3.6% of the visits were for mental health problems among men and 0.7–2.7% among women aged 15–64 years (Pärnänen et al. 2001). In the Finnish OHS, the proportion of visits for mental health reasons was 2% in 1989 (Räsänen et al. 1990) and 7% in 1995 (Martimo et al. 2007). In a study of Finns aged 15–75 years who suffered from depressive disorder only 31% of men and 25% of women were found to have used any health services for their depression. However, approximately 65% of them had contacted a physician for some other reason during the past six months (Hämäläinen J et al. 2004).

In the Health 2000 Study of a population aged 30 years and over, the proportion of subjects having a major depressive disorder who used health services for mental health problems during the past twelve months was reported to be 30% for men and 36% for women. Of the subjects, 84% had visited a doctor at least once in the past year (Hämäläinen J et al. 2008). Service use among persons of working age (30–64 years) with depressive disorders by employment status revealed that 32% of the employed and 47% of the unemployed had visited health services due to mental health problems (Honkonen et al. 2007).

2.2.4 Psychological distress and burnout

The concept of stress has been used since the 1930s. With individuals, emotional or psychological distress is also used. The responses of an individual can be physiological, psychological, or behavioural. Mental stress means a situation in which an individual feels tense, restless, nervous, or anxious, or is unable to sleep because of being troubled (Elo 1992). In addition, stress can be manifested as various somatic symptoms (Leino 1989; Simon et al. 1996). In the working environment, work stress or job strain can develop when the demands of the work and the job decision latitude are not in balance (Karasek et al. 1981). Psychological work-related emotional stress can be experienced when the demands of the work environment exceed the workers' ability to cope with them (European Agency for Safety and Health at Work 2009).

Stress at work is common in European countries. In a survey of the member countries of the European Union in 2005, stress was found to be experienced by an average of 22% of working Europeans. The proportion varied from 12% in the United Kingdom to 55% in Greece (European Agency for Safety and Health at Work 2009). In a Canadian study of white-collar workers, the prevalence of psychological stress symptoms was 27.8% (Bourbonnais et al. 1996).

Psychological stress has been associated with an increased incidence of somatic symptoms (Simon et al. 1996; Piccinelli and Simon 1997), increased morbidity of MSDs (Leino 1989; Leino and Magni 1993; Macfarlane et al. 2000) and coronary heart disease (Stansfeld et al. 2002), and greater sickness absence (Virtanen et al. 2007). It was also associated with confidence in work performance (Williams et al. 1997) and commitment to the work organization (Jalonen et al. 2006).

Studies on health care use have found that psychological stress has increased health care use. Perceived need and seeking help were associated with increased levels of distress in a Canadian survey of individuals aged 15 years and over (Sareen et al. 2005). In a Danish study of 18–65-year-olds, emotional distress was strongly associated with the use of primary health care (Frostholm et al. 2005). Higher levels of distress were found to more likely lead to counselling among students (Rosenthal and Wilson 2008). However, about three-fourths of these students with significant stress had not received counselling.

Burnout is a situation which is considered to develop from prolonged work-related stress. Exhaustion, cynicism, and diminished professional efficacy constitute the main characteristics of the syndrome (Maslach and Jackson 1981; Maslach et al. 2001). Originally it was regarded as a problem in human services work, but later was considered to develop in other work sectors as well (Maslach et al. 1996).

Several psychosocial work characteristics have been associated with burnout. In several studies high demands of work, low control, lack of social support, less opportunity to develop, low predictability, low role clarity, and high role conflicts were associated with burnout (Borritz et al. 2005; Lindblom et al. 2006; Ahola et al. 2006a; Norlund et al. 2010).

High levels of burnout have been associated with psychological distress, depressive symptoms, and alcohol dependence (Ahola et al. 2005 and 2006b; Lindblom et al. 2006). Of physical illnesses, MSDs were associated with burnout among women, and cardiovascular diseases among men (Honkonen et al. 2006).

In Finnish studies the prevalence of severe burnout of working population has been found to vary from 2.4% to 7% and the prevalence of mild burnout from 25% to 48% (Kalimo and Toppinen 1997; Honkonen et al. 2006; Ahola et al. 2009b). In a Swedish study, 13% of working people were found to have experienced high levels of burnout (Norlund et al. 2010).

Associations between burnout and sickness absence have been shown in several studies. Severe burnout has been associated with an excess of sickness absence (Toppinen-Tanner et al. 2005; Borritz et al. 2006; Ahola et al. 2008). In addition, it predicted permanent disability in follow-up studies in two different study populations (Ahola et al. 2009b and c).

One study has explored the relationship between burnout and health care utilization. Burnout was found to be significantly associated with health care use by employees measured by health care costs. The association was not significant measured by the number of times employees accessed health care services (Jackson and Manning 1995).

2.2.5 Insomnia

Sleep disturbances are common symptoms of mental and other health problems (Stewart et al. 2006; Ohayon 2009). The prevalence of insomnia symptoms is common, and it varies by definitions of insomnia. The proportion of those suffering from insomnia varies from 6% up to about one-third of the general population (Ohayon 2002; Stewart et al. 2006; Jansson-Fröjmark et al. 2008; Kronholm et al. 2008).

Insomnia symptoms have been associated with adverse working conditions (Linton 2004; Ota et al. 2005; Jansson-Fröjmark et al. 2007). In a prospective study, 14.3% of employees with no reported sleeping problems developed a sleeping problem during the following year (Linton 2004). Work stress doubled the risk, thus half of the cases could have been prevented by eliminating stress.

Insomnia has been associated with sickness absence in a Norwegian study with a 4-year follow-up (Sivertsen et al. 2009). In a Swedish study, self-reported work-related sleep disturbances were associated with medically-certified sickness absences (Westerlund et al. 2008). Insomnia has been found to independently predict future disability (Sivertsen et al. 2006; Overland et al. 2008).

Sleep problems have also been found to increase health care utilization measured by numbers of visits to primary care physicians and mental health care professionals (Manocchia et al. 2001). In a study of 20–60-year-olds in Sweden, 15%–16% of the respondents reported that they had consulted health care during the past 3 months due to poor sleep (Jansson-Fröjmark et al. 2008). In a study of American employees, insomnia was associated with increased costs of health care use, as well as greater absenteeism and co-morbidity (Kleinman et al. 2009).

2.2.6 Lifestyle factors

Negative lifestyle factors such as smoking, alcohol abuse, physical inactivity, and obesity increase sickness absence, disability, morbidity, and mortality (Marmot et al. 1993; Spak et al. 1998; Upmark et al. 1999; Laaksonen et al. 2007; Alavinia et al. 2009; Statistics Finland 2009a; Harvey et al. 2010; Waller et al. 2010). Lifestyle factors have been found to affect health care use (Frostholm et al. 2005).

Of lifestyle factors, increased physical activity was associated with fewer physician visits (Wetzler and Cruess 1985). Physical inactivity has been found to increase health

care charges including physician, inpatient and outpatient charges (Anderson et al. 2005). Another study has found an association between physical inactivity and health care charges of visits to health care (Pronk et al. 1999).

Obesity has been found to increase the number and cost of outpatient visits, inpatient days, and laboratory services (Quesenberry et al. 1998; Pronk et al. 1999; Anderson et al. 2005; McDowell et al. 2006). Smoking also increases health care use as measured by billed health care charges (Pronk et al. 1999).

The Health 2000 Study reported the prevalence of hazardous alcohol consumption among Finns aged 30–64 years to be 5.8%, for males it was 8.5% and for females 3.1% (Halme et al. 2008). In the OHS setting, 29.4% of men and 13.1% of women were heavy drinkers measured by Alcohol Use Disorders Identification Test (AUDIT) questionnaires among those contacting OH physicians in OHS clinics (Kaarne et al. 2009). Of 30–64-year-olds who were classified as hazardous drinkers, 78% were employed (Halme et al. 2008).

Seeking treatment for alcohol problems occurs infrequently. Among Finns aged 30 or over, actively alcohol dependent subjects had used health or social services for alcohol problems within the previous year in 15.6% of cases, and mental health services in 16.8% (Honkonen et al. 2007). Several studies of the working age population with an alcohol use disorder found that only 12% of subjects had visited health care due to alcohol (Bijl and Ravelli 2000; Wu and Ringwalt 2004; Honkonen et al. 2007). In an American study, of those who did not receive treatment, 8% of women and 10% of men perceived a need for it (Wu and Ringwalt 2004).

2.3 Connections between work-related health problems / changes in work ability and primary care visits

2.3.1 Work-related health problems

Preventing work-related health problems and work disability are the main tasks of OHS. According to a WHO expert committee, work-related illnesses can be caused, aggravated, or accelerated by work, or can impair work ability (WHO 1985). Occupational diseases are at the other end of the spectrum of work-related health problems. They are consequences of specific causative factors at work. There is a direct cause-and-effect relationship between hazard and disease, and these factors can be identified and measured. In Finland, these causative factors and diseases are determined in the Act of Occupational Diseases (1988). Occupational diseases are compensated for by employers' insurance companies.

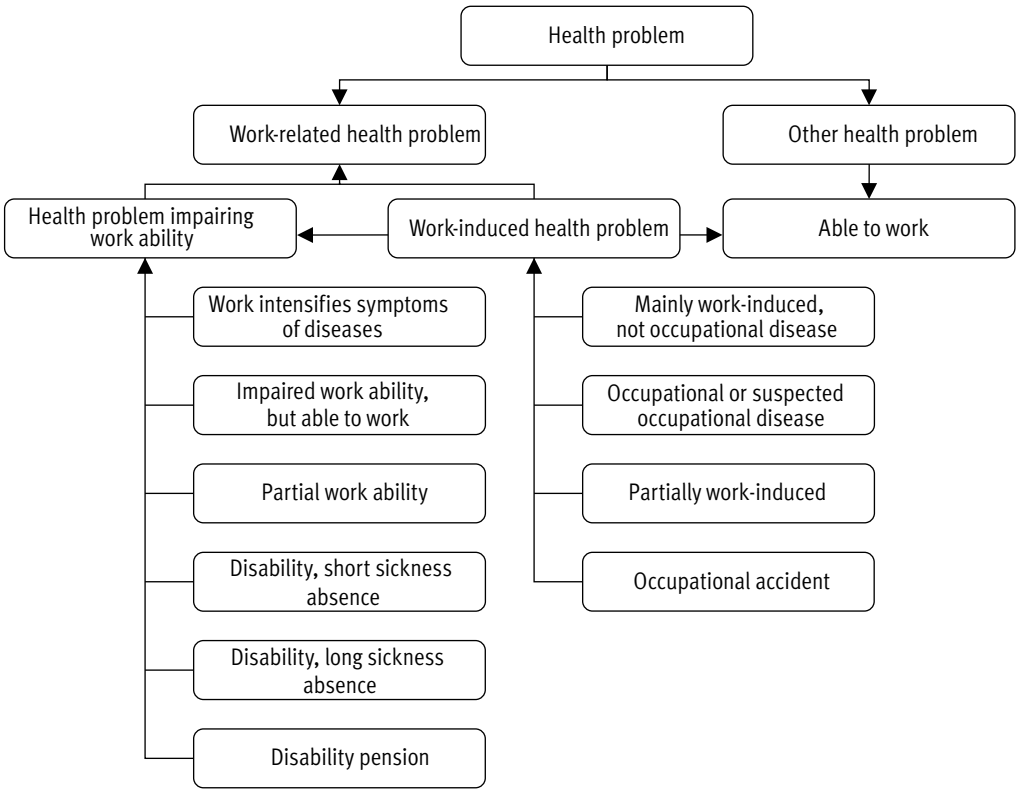
Other work-related health problems are more common than occupational diseases. These are associated with certain exposures at work, such as physical and mental workload, adverse psychosocial factors, workers' habits and lifestyle, individual susceptibility, and sometimes combined occupational and general environmental

exposures (WHO 1985). Work-related health problems are multifactorial, and the same health problems may also occur in the general population without any relation to work. However, when they affect the worker they may be work-related. Examples of work-related diseases according to the WHO expert committee are stress problems, mental disorders, and alcohol abuse. Other examples are hypertension, ischemic heart disease, chronic non-specific respiratory disease, and MSDs.

Many studies assume work-related health problems to be mainly work-induced, and work ability is studied separately. In this study the concept "work-related" is used according to the WHO definition which comprises work ability as well. The spectrum of work-related health problems is illustrated in the Figure 1.

In the European Union 8.6% of workers experienced work-related health problems in 2007 (Eurostat 2009). Most of the problems were of musculoskeletal origin: 28% of the workers reported back problems and 19% reported neck and upper extremity problems. Stress, depression, or anxiety was reported by 14% of the respondents as their most serious work-related health problems.

Figure 1. *Work-related health problems adapted from the definition of the WHO expert committee.*



Source: WHO 1985.

In the UK in 1996–2001, musculoskeletal and mental disorders were the illnesses mostly reported as work-related by occupational physicians (Cherry and McDonald 2002). In 2006–2007, GPs with training in occupational medicine also mainly reported MSDs (53.3%) and mental ill-health (29.7%) as work-related. For mental ill-health diagnoses, GPs mainly reported stress and anxiety or depression (Hussey et al. 2008). In Scotland in 2002–2003, mental ill-health was most frequently reported (41%), followed by musculoskeletal disorders (31%), skin disorders (16%), and respiratory diseases (10%) (Chen et al. 2005). In a Norwegian study, 60% of the respondents reported health problems during past month which were regarded as completely or partially caused by working conditions (Mehlum et al. 2009).

In a Finnish survey of employees in 1992, 61% of the respondents reported at least one work-related symptom as having occurred during the past two weeks. The employees regarded 70% of their musculoskeletal symptoms as work-related and 57% of their mental symptoms (Räsänen et al. 1997). In 2009, 40% of the working population experienced work-related symptoms during the last 6 months (Kauppinen 2010).

Several studies on work-related health problems have been conducted in general health care settings. In a Norwegian study of general practice, 40% of women and 54% of men regarded their symptoms as work-related (Hilt et al. 2003). Of musculoskeletal symptoms, 67% were at least possibly work-related, and of mental symptoms 50%. In an American study of patients with other than respiratory problems, 39% of the patients reported possible causation by work, and 66% reported a possible increase in symptoms due to work (Harber et al. 2001). An Australian study of general practice found 2.6% of all visits to be caused by work-related problems (Charles et al. 2006). Of these, musculoskeletal problems accounted for two-thirds of work-related problems. Psychological problems accounted for about 1 in 10 work-related problems.

In prospective studies of the general practice population, incidences of consulting for work-related diseases varied from less than 5% up to 15.9% (Weevers et al. 2005). The American National Ambulatory Medical Care Surveys of office-based medical care from 1997–2000 showed that 2.5% of all office visits were for work-related illnesses (Won and Dembe 2006). Family physicians provided care for 22% of these visits, 33.7% orthopaedic surgeons, and 7.5% physicians in occupational medicine. Injuries accounted for 60% of the work-related visits to occupational medicine, musculoskeletal problems for 30%, and mental health problems for 1% of visits.

In a study on visits to Finnish OH physicians, patients assessed the main reason for the visit being at least possibly work-related (caused or aggravated by work) for 55% of the visits, while OH physicians' assessments were at least possibly work-related in 34% (Martimo 2010). In the same study, mental disorders were work-related in 49%, and possibly work-related in 34% of the visits assessed by patients, and 26% and 32%, respectively, in visits assessed by OH physicians. MSDs were work-related in 33%, and possibly work-related in 41% of the visits assessed by patients, and 22% and 34%, respectively, in visits assessed by OH physicians.

2.3.2 Work ability

Maintaining and promoting work ability is an important task of OHS. Good work ability of the working population supports employment and lengthens working lives. The main determinants of work ability according to Ilmarinen are health, functional capacity, and the demands of work upon the individual. In addition, other important determinants are the individual's expertise, values and attitudes, and the immediate community of individuals and their life circumstances (Ilmarinen 2006). In the present study, the tool for assessment of work ability in the OHS was the work ability index (WAI) developed at the FIOH (Tuomi et al. 1997 and 1998).

Work ability and its assessment in the form of sickness certification as well as treatment and assessment of long-term disability are an essential part of OHS primary care in Finland (Manninen et al. 2007). Prevention, management of impaired work ability through workplace interventions, and rehabilitation can be integrated into primary care in OHS.

In primary care visits the OHS should find employees with perceived poor work ability and at risk for disability especially those with MSDs and mental disorders. In the Health 2000 study, 8% of employed women aged 30- to 64-year old perceived their work ability as impaired, and 7% of employed men (Gould 2006). In the Work and Health Survey 2009, 82% of women and 84% of men reported good work ability. Of women and men, 12% and 15%, respectively, had intentions to retire due to health problems before retirement age (Kauppinen 2010). Poor self-rated work ability was found to increase early retirement intentions in an 11-year longitudinal study (von Bonsdorff et al. 2010). Musculoskeletal and mental disorders were the main reasons for disability pensions, and over half of the sickness absence spells were due to musculoskeletal and mental disorders (Eläketurvakeskus 2010; Kela 2010b). MSDs and mental disorders have been the main reasons for long-term sickness absences and disability pensions also in other countries (Laitinen-Krispijn et Bijl 2000; Foss et al. 2010; Vahtera et al. 2010; OECD 2010).

Most studies on work ability are carried out in general practice settings. In a Norwegian study of 1058 consecutive patients in general practice, 23% of the patients regarded themselves as unable to work, and 6% were uncertain of their work ability (Gulbrandsen et al. 1998). In a Belgian study of disability management, 34% of sick-listed workers reported that their sickness absence (over 1 month) was due to a work-related health problem. Of these workers, 61% had an orthopaedic problem, 20% had a mental health problem, and 19% had other disorders (Mortelmans et al. 2008). In general practice settings, of cases in which work ability was reduced as assessed by GPs (sickness certified under 8 days), 30% were MSDs, 29% respiratory disorders, 13% psychological disorders and 28% other disorders due to injuries (Reiso et al. 2000). In another study, of patients seen by GPs 12.3% had a disability that affected work capacity (Weevers et al. 2005). In an American study of 108 patients in general practice, less than 30% reported no effect of their illness on their work ability

(Harber et al. 2001). Individuals with musculoskeletal disorders reported effects most frequently (80%). In Switzerland, GPs issued 75% of all sickness certificates (Bollag et al. 2007). Work-related cofactors were mentioned in 5% of the certificates. In sickness absences over 3 weeks in length, the proportion was slightly higher, 8%. In a Finnish study of visits to OH physicians, sickness certificates were issued in 33.8% of visits (Räsänen et al. 1997).

In a study of visits to Finnish OH physicians, 22% of the patients regarded their work ability in terms of having a partial disability and 11% as having a full disability (Martimo et al. 2007). Mental disorders caused at least partial self-assessed disability in 53% and MSDs in 44% of the patients. The risk of disability was higher for older employees and blue-collar employees. A short duration of symptoms, mental disorders and MSDs were associated with more self-assessed work disability. The work-relatedness of the disease increased the risk of both partial and full work disability.

2.4 Connections between socio-demographic and workplace-related factors and primary care visits in OHS

2.4.1 Sociodemographic factors

Of sociodemographic factors, gender differences in health care use have already been presented in section 2.1.6. Age is predictive of medical service use over long periods (Green and Pope 1999; Ladwig et al. 2000). A Norwegian study of police service found that all age groups over 30 years contacted OHS significantly more often than the age group 20–29 years, while contact with other health care showed only small differences. Women had significantly less contact with OHS than did men, but women contacted other health care more often (Berg et al. 2006). In a Finnish study, age was not associated with visits to physicians for primary care or intended use of OHS (Räsänen et al. 1993).

Marital status has been found to predict the use of health care in men, in that married and divorced men used more primary health care than widowed or never married (Parslow et al. 2004a). Employment status also has effect on service use. A Finnish study found that permanently employed respondents had visited a physician more often than fixed-term employees and the unemployed. The probability of visiting public primary health care was higher for non-permanent employees than for full-time permanent employees, and the probability of visits to OHS was lower. A tendency towards more visits to hospital outpatient clinics was found in non-permanent employees (Virtanen et al. 2006b). Unemployed persons aged 30–64 years used health services more often than employed persons for mental health problems or alcohol use disorders according to the Health 2000 Survey (Honkonen et al. 2007).

The probability of health care use has been associated with higher income among adults aged 18–64 years (Häkkinen 2002). In Finland, greater health care use in high-income groups at the same level of need has been found; in particular private visits

were concentrated among high-income groups (van Doorslaer et al. 2000). Räsänen and co-authors found that occupational class did not associate with physicians' visits in primary care or intended use of OHS (Räsänen et al. 1993).

2.4.2 Workplace-related factors

Of the psychosocial work-related factors, workplace harassment, social support, and job control are examined in this study as these factors are associated with sickness absences and were hypothetized to also be associated with the use of OHS. Other factors related to the workplace are the size of an organization and the requirement of sickness certificates.

Workplace harassment, for which the terms "bullying" and "mobbing" have also been used, has been examined in several studies. In a Danish population study of employees aged 20–59 years, 8% of the respondents were found to have been bullied within the past year (Ortega et al. 2009). In France, the prevalence of workplace bullying has been reported to be 10% (Niedhammer et al. 2009). Workplace harassment has been reported to increase sickness absence in Swedish and Finnish studies (Kivimäki et al. 2000; Voss et al. 2001). It was associated with sleep disturbances (Niedhammer et al. 2009) and risk for depression (Kivimäki et al. 2003). In one American study of the utilization of professional services, chronic harassment was associated with increased use of mental health services among women (Shannon et al. 2007).

In Finland, workplace harassment is reported to have been experienced by approximately 16% of municipal employees (Varhama and Björkqvist 2004). In Finnish hospitals 5% of employees have experienced bullying (Kivimäki et al. 2000 and 2003).

Lack of social support at work has many consecutive effects on employees' health and working life. Low support from co-workers and supervisors has been associated with psychological distress, sleeping difficulties, mental disorders, antidepressant use, and musculoskeletal symptoms (Bourbonnais et al. 1996; Macfarlane et al. 2000; IJzelenberg and Burdorf 2005; Rugulies et al. 2006; Sinokki et al. 2009 and 2010). Greater social support at work has been associated with lower sickness absence in the Whitehall II Study (North et al. 1996). Results vary when co-worker and supervisor support are considered separately. In a Dutch study, greater co-worker support was associated with lower sickness absence, but not with the number of sickness episodes (Roelen et al. 2009). Supervisor support was not significantly associated with sickness absence. In a Danish study low supervisor support was found to predict both short and long absences among men, but not among women. Co-worker support was not significantly associated with sickness absence (Nielsen et al. 2006).

In a population-based study of Finnish employees, 18% of men and 15% of women assessed their support from supervisors to be low. Co-worker support was assessed as low by 7% of men and 6% of women (Sinokki et al. 2009). In a study of personnel

working in the forest industry, 17% of men and 23% of women considered support from supervisors to be low, and from co-workers 18% of men and 30% of women (Väänänen et al. 2003). The same study found that lack of co-worker support increased the frequency of long sickness absences among men and lack of supervisor's support among women (Väänänen et al. 2003). Low support from supervisors was found to predict disability pension in a six-year follow-up study, but the association was insignificant after adjusting for perceived health at baseline (Sinokki et al. 2010b).

Few studies exist on associations between social support and health care use. In a study of industrial workers with low back pain, less social support from supervisors was associated with health care use, while social support from co-workers had no effect (IJzelenberg and Burdorf 2005). Among employees with neck or upper extremity symptoms, the associations were insignificant.

Job control is measured in most studies by Karasek's demand-control model (Karasek et al. 1981 and 1998), which can be divided to decision authority and skill discretion. The terms "decision latitude" or "influence on work" are also used to describe the possibility of controlling one's work. In this study, the term "influence" is used.

In the French Gazel study, the prevalence of low decision latitude was found to depend on occupational status, varying from 15% among male managers to 75% among female clerks (Melchior et al. 2003). Of Dutch industrial workers, 47% rated job control as low (IJzelenberg and Burdorf 2005). Based on self-reports, 18% of men and 24% of women in the Finnish forest industry considered job autonomy to be low (Väänänen et al. 2003).

Low decision latitude has been associated with increased risk for cardiovascular disease (Karasek et al. 1981) and psychiatric disorders as assessed by general health questionnaire in the Whitehall II Study (Stansfeld et al. 1999).

In a Finnish study, low job control was also associated with a higher likelihood of 3 or 4 adverse health behaviours among men (Kouvonen et al. 2007). In a Danish prospective study, women with low influence at work were found to be at increased risk for severe depressive symptoms in a 5-year follow-up (Rugulies et al. 2006). In another longitudinal study, low decision latitude at work did not increase the risk for major depressive disorder or generalized anxiety at age 32 (Melchior et al. 2007).

Several studies have found an association between low decision latitude and sickness absence (North et al. 1996; Väänänen et al. 2003; Melchior et al. 2003; Nielsen et al. 2006). A negative change in decision latitude or job control was associated with higher risk for sickness absence in follow-up studies (Vahtera et al. 2000; Head et al. 2006). Low control at work has also been found to increase intended early retirement in a study of 10 European countries (Siegrist et al. 2007). There are few studies on the associations between job control and health care use. In a study of industrial workers with low back pain, low job control had no effect on health care use (IJzelenberg and

Burdorf 2005). In addition, a study of Australian government employees found that employees were more likely to visit a GP if they reported less job control (Parslow et al. 2004b).

In Finnish studies on physician utilization such work-related factors as the size of workplace and the requirement of presenting a sickness certificate from the first day of sick leave were associated with visits to OH physicians more often than to visits to all other physicians (Räsänen et al. 1993; Räsänen 1998).

2.5 Prevention and interventions in primary care

Preventive activities can be divided into primary, secondary, and tertiary prevention. Primary prevention means prevention before a disease has begun to develop. It diminishes the susceptibility of an individual and inhibits disease in communities. Secondary prevention aims at preventing the worsening of a disease by eliminating risk factors, in practice it is treatment. Tertiary prevention aims at stopping a disease from worsening or restoring working and functional capacity. Rehabilitation is a part of tertiary prevention (Koskenvuo 2003). The levels of prevention and interventions in OHS are illustrated in Table 1 (STM and FIOH 2010).

Health behaviours such as tobacco use, hazardous alcohol consumption, lack of exercise, poor diet, and obesity are modifiable causes of preventable morbidity. In this study, as a part of preventive activities, health promotion by OH physicians is assessed. Little knowledge exists on how OH physicians promote health during primary care visits. A comparison of studies is difficult, as the concept of health promotion or preventive services differs between studies. In OHS primary care, preventive activities also focus on preventing work-related health problems and maintaining work ability. These can be aimed at individuals or workplaces.

Table 1. *The levels of prevention and interventions.*

	Level 1, primary	**Level 2, secondary**	**Level 3, tertiary**
Target	Workplace, work community, individual	Individuals susceptible to impaired work ability	Individuals with impaired work ability
Identification	Needs of workplaces	Symptoms of diseases, individual's own initiative, initiative of employer or OHS	Disease, sick leave, impaired work performance, follow-up in OHS
Measures	Prevention, promotion of healthy lifestyle, improvements in workplace and work community, workplace health promotion programmes	Problem solving, treatment, work adaptation, replacement, improvements in workplace and work community	Treatment, rehabilitation, education, replacement, improvements in workplace and work community

Source: STM and FIOH 2010 (adapted).

2.5.1 Preventive activities aimed at individuals

Only a few published studies on preventive activities in OHS could be found. In Swedish OHS, 70% of physicians and 85% of nurses have reported that they frequently discussed alcohol problems with their patients (Holmqvist et al. 2008). In a study on ageing Finnish workers, over 90% of respondents considered primary care in OHS as important to health promotion (Naumanen 2006). In primary care of Finnish municipal health centres, GPs assessed clinical work as the principal way to promote health (Mattila et al. 2004).

Preventive activities seem to be common during visits to physicians and mainly concern lifestyle factors. In a few studies on primary care, the proportion of visits for illness where some preventive services or health promotion were delivered by a physician has varied from 24% to 68.9% (Stange et al. 1998; Flocke et al. 1998; Chernof et al. 1999; Wilson and Childs 2006). In one study, patients who were more likely to receive preventive services were found to be new patients, patients with fewer visits in the past year, obese, smokers, or alcohol drinkers (Flocke et al. 1998). Preventive services were delivered less during visits for acute illnesses (Stange et al. 1998; Chernof et al. 1999). Visits for the management of chronic conditions were longer and included more advice regarding exercise, nutrition, and health promotion (Yawn et al. 2003).

In three American studies counselling about lifestyle habits was found to vary widely. Counselling about smoking occurred in 4% to 40.7% of visits, about exercise and physical activity from 14% to 47.8%, about diet from 38.8% to 45%, and about alcohol 37.5% (Chernof et al. 1999; Ma et al. 2004; Pollak et al. 2008).

In a survey of attitudes of Finnish GPs on cardiovascular risk factors, smoking was considered as the most important risk factor by 36.3% and overweight by 10.4% of the physicians (Hartikainen et al. 2006). In a study of 1000 consecutive 15–65-year-old patients of GPs, 6.3% of all participants and 11.9% of excessive drinkers were asked about alcohol drinking at the consultation (Aalto et al. 2002).

2.5.2 Interventions aimed at work

The main aims of OHS are to prevent work-related illnesses, promote health and safety at work, and promote work ability among employees. Interventions at workplaces by OHS are mainly workplace visits and workplace health promotion programmes. In health check-ups and visits for primary care, employees may refer to work-related matters which affect health at work. This gives OHS professionals the possibility to focus interventions on individuals or workplaces.

In reducing work-related MSDs and preventing disability caused by them, the most effective interventions have been in combining measures and in involving workplaces in the process (Frank et al. 1998; Williams et al. 2004; Silverstein and Clark 2004;

Burton et al. 2009; Lambeek et al. 2010). Measures may comprise biomedical treatment, ergonomic workplace interventions, activity programmes, and work arrangements. A Dutch intervention programme carried out by OH physicians and focused on employees at risk for early retirement resulted in a reduction in retirement (de Boer et al. 2004). It comprised three consultations in a 16-week period, an action plan for necessary workplace adaptations, contacts with supervisors, and appropriate consultations with other specialists. In cases of employees with mental health problems both individual and workplace interventions have been effective in reducing occupational stress and mental health problems (van der Klink et al. 2001; Michie and Williams 2003; Ruotsalainen et al. 2008). Further, OH physicians' case management, including keeping regular contact with the employee and work organization, has predicted earlier return to work (Rebergen et al. 2010).

Work-related interventions were considered to be beneficial in one-third of visits by employees to OH physicians for primary care, most frequently when the reason for the visit was a mental (56%) or musculoskeletal disorder (39%) (Martimo et al. 2007). In a Finnish cross-sectional study of visits for primary care to OH physicians, work-related interventions were recorded to have taken place in 8.8% of the visits (Räsänen et al. 1997). Interventions consisted of counselling or advice to patients regarding work (91%), a telephone contact (6%), a written notice to the workplace (6%), or a planned workplace visit (3%). The proportion of visits with a suspected or proven occupational disease as a main reason for the visit, was 0.03%. Work-related interventions were made in all disease categories: most concerning visits for MSDs (15%), mental disorders (12.8%), endocrine, nutritional, and metabolic disorders (12.7%), skin problems (10.9%), and circulatory disorders (10.8%). The lowest proportion was for respiratory diseases (4.3%). OH physicians with most experience were more active in work-related interventions. The interventions were more often observed in employer-owned OHS units and joint-model OHS units than in the OHS units of municipal health centres and private medical centres.

In primary care settings, 60% of patients have reported that workplace changes would improve functional status. The changes considered beneficial included changes in workload, working hours, work environment, as well as personal protective devices (Harber et al. 2001). In the Netherlands, a cohort study of employees sick-listed for 12–20 weeks due to mental health problems compared the care of OH physicians and GPs (Anema et al. 2006). The GPs discussed working conditions less often (28%) than OH physicians (43%), seldom contacted the employer (1.9%), and never recommended work-related interventions. The OH physicians applied work-related interventions for 17.3% of the employees and contacted the employers of 10.6%. Interventions included advice or altering an employee's working conditions. In a Dutch survey of consultations in general practice of employees having MSDs, GPs and patients discussed work-related matters in 36% of the consultations (Weevers et al. 2009).

3 AIMS OF THE STUDY

The aim of this study was to determine the position of OHS primary care in Finnish health care among the working population, and to analyse the use and provision of OHS services, the delivery of primary care, and the work of OH nurses and OH physicians, as the coverage of OHS primary care has increased. In addition, the aim was to examine how the characteristic features of primary care in OHS have been achieved in relation to health problems, lifestyle health risks, work ability, and preventive activities.

The specific study questions were as follows:

1. What is the situation in the use of primary care in OHS among working men and women, the activities of OH nurses and OH physicians, the provision of OHS, and the expenses of primary care in OHS? (Study I–IV)

2. How are health problems and health risks (lifestyle factors) connected with primary care visits in OHS? (Study II–V)

3. What is the connection between work-related health problems / changes in work ability and primary care visits in OHS? (Study II–IV)

4. What is the connection between socio-demographic and workplace-related factors and primary care visits in OHS? (Study II–IV)

5. How do primary care visits to OH physicians lead to prevention and interventions? (Study V)

4 MATERIALS AND METHODS

4.1 Data Sources

Four different sources of data were used (Table 2). The first, occupational health care statistics, contain information on the use of occupational health services for which Kela provides reimbursements (Study I). The second, the Health 2000 Survey, was a large project conducted by THL which collected data on the major public health problems and health care use of a representative population sample; in this study the data of working people aged 30–64 years were analysed (Study II). The third, the Work and Health Survey 2006 conducted by the FIOH contains data on work, health, and health care use among working-age (25–64 years) persons in a representative cross-sectional study (Studies III and IV). The fourth was a clinical survey conducted by OH physicians in a private OHS unit of the Lääkärikeskus-yhtymä (Study V). The focus in all these studies was on primary care in OHS.

Table 2. *Description of the databases.*

	Data source	Type of study	Population	Sample size	Main outcomes
Study I	Statistics of Kela (1996–2005)	Analysis of the statistics on the use of occupational health care	Employed population	All employees in the applications for reimbursement	Activities and expenses of OHS
Study II	Health 2000 Study	Cross-sectional survey (interview, health examination, questionnaires)	30–64-year-old working employees	n = 3126	Health care use and related health problem
Study III	Work and Health Survey 2006	Cross-sectional survey (computer-assisted telephone interview)	25–64-year-old working employees and self-employed	n = 1753	Health care use and related factors
Study IV	Work and Health Survey 2006	Cross-sectional survey (computer-assisted telephone interview)	25–64-year-old working employees	n = 1636	Visits to OH physicians and nurses, and related factors
Study V	OH physicians' practice	Cross-sectional, clinical study	Employees in OH physicians' practice	n = 651	Work-related health problems, interventions

4.1.1 Occupational Health Care Statistics (Study I)

Kela's statistics on employers' reimbursements of OHC expenses between years 1996 and 2005 were analysed (Kela 1999 and 2007). The reimbursements of the self-employed were excluded. The key statistical data are largely comparable since 1979. However, after the reform of the reimbursement system in 1994 the statistics

contained data based on the new reimbursement system set up in 1996. In 2002 the statistics changed the division of OHS providers so that private OHS clinics were presented separately. Other OHS providers were the OHS units in municipal health centres, the OHS units of other employers, employer-owned OHS units, joint-model OHS units, and the group of other OHS units including the OHS of the state. From 2007, state OHS have been divided into actual providers (Kela 2009). For this study, Kela produced additional reimbursement statistics for the years 1998–2001 in which private OHS clinics were separately presented. It was not possible to examine the data of the years 1996 and 1997 due to technical reasons.

4.1.2 The Health 2000 Survey (Study II)

The main responsibility for the project planning and implementation of the multidisciplinary Health 2000 Study was assigned to the THL in collaboration with other research institutes like the FIOH and its methods have been published earlier (Heistaro 2008). The study was carried out from August 2000 to June 2001. Home-interviews were conducted by trained interviewers in the form of a computer-assisted personal interview. The interview questionnaire covered aspects of health status, illnesses, use of health care services, functional capacity, living conditions, living habits, rehabilitation, employment, and work ability. The basic questionnaire that was returned in connection with the health examination covered questions about functional capacity, quality of life and income, common symptoms, weight and height, time use and leisure activities, physical exercise, alcohol use, health promotion, living environment, psychological experiences, mood and feelings, job perception, and job strain. In addition, comprehensive health examinations were carried out including mental health interviews and clinical medical examinations. The purpose of the clinical medical examination was to assess the participant's main chronic diseases, to determine the need for treatment, and to assess functional capacity.

The mental health interviews were conducted by trained interviewers using a structured and validated interview called the Composite International Diagnostic Interview (CIDI). In the Health 2000 Study, the German version (M-CIDI) translated into Finnish was used (Wittchen et al. 1998). The mental health interview assessed mood disorders, alcohol use disorders, psychotic symptoms, and anxiety disorders.

4.1.3 Work and Health Survey 2006 (Studies III–IV)

Participants in the Work and Health Survey 2006 conducted by the FIOH comprised 4971 Finnish-speaking individuals aged 25–64 years, randomly selected from the Population Information System. Of these, 3122 (63%) completed a computer-assisted telephone interview. The study population was representative of the Finnish working-age population in terms of age and gender (Perkiö-Mäkelä et al. 2006).

Carried out between January and May 2006, the study was a cross-sectional survey comprising questions related to subjects' perceived health, work ability, health behaviour, sickness absence, working conditions, life situation outside work, and OHS (Perkiö-Mäkelä et al. 2006).

4.1.4 Clinical study (Study V)

The data for the Study V were collected from consecutive visits to four OH physicians in a private OHS unit of the Lääkärikeskus-yhtymä over 5 weeks between May 2007 and February 2008 during different seasons. The chosen weeks were not randomized, and the OH physicians were aware of the purposes of the study.

4.2 Study populations

Study II. In Study II the data from The Health 2000 Survey of working employees aged 30–64 years was used. The two-stage stratified cluster sample was representative of the Finnish population. Of the original sample (n = 8028), 5871 participants were aged 30–64. Of this sample, 5152 (88%) were interviewed, 4911 (84%) returned a questionnaire, and 4886 (83%) participated in a health examination. Altogether, 3126 employees had worked full- or part-time within the previous 12 twelve months.

Study III. Of Study III's participants, 1753 working subjects had access to primary care services through their OHS. In the analysis of all physician visits all respondents (n = 3122), also those who were not working, were included. In the other analyses, a group of 1753 respondents was used.

Study IV. In Study IV the study population comprised the same 1753 subjects as in Study III but 117 self-employed people were excluded, leaving 1636 working employees.

Study V. Study V's data is from 778 consecutive visits to four OH physicians of a private OHS unit of the Lääkärikeskus-yhtymä. Thirty patients had refused to participate, and 93 visits were deleted due to forgetting to give information or consent forms. Four visits by entrepreneurs were excluded and only visits by employees were included, leaving 651 visits. Women (59%) were overrepresented in the study population compared to wage-earners in the whole Finnish population (50%). The proportion of blue-collar workers was lower (18%) in the study population compared to the national proportion (35%), so the sample of blue-collar workers was limited (Statistics Finland 2009b).

4.3 Methods

Study I. In Study I the activities and expenses of the OHS were analysed. Activities comprised the numbers of visits to OH professionals for primary care and health

check-ups, laboratory and radiological tests for primary care, and hours spent on workplace visits and counselling. The data were presented by OHS providers; the numbers have been presented in percentages. The expenses have been presented according to the Euro's value in 2005, and the conversion was made by the cost index of public health care (1985 = 100). This enabled the comparison between the expenses of general health care and those of the OHS.

Study II. Study II was based on the data of the Health 2000 study gathered in the questionnaires, interviews and clinical examinations. A depressive disorder means receiving a diagnosis of major depressive disorder or dysthymia within the preceding 12 months. Alcohol use disorder means a 12-month prevalence of alcohol dependence and alcohol abuse. Hazardous health behaviour in alcohol consumption was considered if the individual had an alcohol use disorder or consumed more than 280 g weekly for men and 140 g for women (Salaspuro et al. 2005). Of other health risks, smoking, obesity, and physical inactivity were assessed. Daily smoking was considered regular smoking, a body mass index 30 kg/m^2 was the limit for obesity, and health-promoting physical activity was considered insufficient if the respondent exercised less than four times a week, for at least half an hour at a time.

Burnout was measured using the Maslach Burnout Inventory – General Survey (MBI-GS) (Maslach and Jackson 1981; Maslach et al. 1996). To assess the level of burnout, a weighted sum score of the three dimensions (exhaustion, cynicism, and lack of professional efficacy) was calculated. Sleep problems were assessed in the questionnaire and depressive symptoms were assessed using a Beck Depression Inventory (BDI) (Beck et al. 1961 and 1988).

The information on chronic illness impairing work ability was gathered by interview and diagnoses of MSDs were based on the clinical medical examination. Information on work ability was collected in the health interview and by questionnaires, including the WAI items developed at the FIOH (Tuomi et al. 1997 and 1998).

The outcome variable was health care utilization measured by numbers of self-reported visits due to illnesses or symptoms to OH nurses, OH physicians, and HC physicians during the past 12 months.

Study III. In Study III the demographic and socio-economic variables were age, vocational education, income, and job contingency. Variables concerning a subject's health were chronic illnesses impairing work ability, and stress symptoms. The OHS variables were provider, access to OH nurses, and access to OH physicians. Size of organization and the requirement to produce a sickness certificate from the first day of sick leave were work-related variables. The psychosocial work-related variables were the ability to influence matters concerning one's work as well as workplace harassment.

The outcome variable was the use of health care services measured by the numbers of visits due to illnesses to OH physicians, HC physicians, private physicians, physicians at hospital outpatient clinics, and other physicians during the past six months.

Study IV. In Study IV the variables were age, OHS provider, having to provide a sickness certificate from the first day of sick leave, influence on work and workload, and support from co-workers and supervisors. The outcome variable was the use of OHS for primary care measured by visits to OH nurses and OH physicians during the past six months.

Study V. In Study V's setting patients made an appointment mainly beforehand by telephone or internet, or nurses directed them to doctors from their visits. Some of the patients for acute reasons were treated by GPs in the same medical centre and were not included in the study. Patients in the waiting room were given by the receptionist an information sheet of the study and they signed a consent form before the consultation with the OH physician. After the visit, the OH physicians assessed the work-relatedness and the effect on work ability of the patient's health problems. The main health problem was used in the analysis. The health problem was assessed having been caused or partially caused by work, as having been aggravated by work, as impairing of work ability, or as causing disability (sickness absence). The work-induced health problems were mainly and highly likely (over 50% probability) caused by work. Partially work-induced was under 50% probable. The OH physicians also assessed their own prior knowledge of the employee's work, workplace, and health. During the visit they also assessed the need for interventions concerning work or workplace as well as health promotion activities. Interventions consisted of advice and counselling on work-related matters; recommendations to speak with supervisors, or to arrange a meeting between the patient, supervisors, and OHS; workplace visits; or adaptations of work, and work reassignments.

4.4 Statistical analyses

Study I was descriptive, and no calculations of statistical significance were included. In Studies II to V the statistical significance in cross-tabulations was tested using a chi square test. The relationship between visits to OH nurses, OH physicians, and HC physicians, and the explanatory variables were tested by multivariate logistic regression models adjusted for age (Study II). The outcome variable was dichotomic. Weighting adjustment and sampling parameters were used in the analyses to take into account the survey design complexities, including clustering in a stratified sample. The procedures of SAS-callable SUDAAN software version 10.0 were used separately for men and women for the statistical analyses.

In Study III and IV multivariate Poisson regression analyses were used because of the skewed distribution of visits and the large proportion of subjects without visits. The averages and standard deviations of the numbers of visits were calculated by standard

statistical procedures. The differences between the averages of OH nurse and OH physician visits were tested by one sample's Student t-test (Study IV). In Study V a logistic regression model was used to test the relationship between interventions and explanatory variables. The analyses were carried out using SAS statistical packages, version 9.1.3.

5 RESULTS

5.1 Use of OHS for primary care among working men and women, activities of OH nurses and OH physicians, OHS provision, and primary care expenses (Studies I–V)

Study I. Between 1996 and 2005 the proportion of employees who had access to primary care through OHS increased from 84% to 91% (Study I). Table 3 shows that the increase continued according to the statistics of 2008 from Kela (Kela 2010a). Visits for primary care in OHS and health check-ups increased during these years and the increase continued until 2008. Visits for primary care and health check-ups per employee decreased until 2005, after which time it remained relatively level.

The number of visits to OH professionals showed that the proportion of visits to physicians increased from 49% to 61% of all visits for primary care to different OH professionals between 1996 and 2005. The visits per employee to physicians increased by 18%, from 1.55. to 1.83, and to nurses decreased by 25%, from 1.11 to 0.83. Table 4 (p. 44) shows how numbers of visits to OH professionals changed between 2005 and 2008. Visits to physicians for primary care per employee still increased to 1.93 visits, and to nurses decreased to 0.80 visits.

Table 3. *Changes in the use of OHS from 1996 to 2008: number of employees, visits, and diagnostic tests.*

	1996	2005	Change 1996–2005, %	2008	Change 2005–2008, %
Number of employees having OHS	1.43 million	1.76 million	+23	1.88 million	+7
Employees having access to primary care in OHS	1.2 million	1.6 million	+33	1.73 million	+8
Visits for primary care	3.8 million	4.8 million	+26	5.25 million	+10
Visits for health check-ups	0.91 million	0.96 million	+5	1.02 million	+6
Visits for primary care per employee	3.16	2.99	−5	3.03	+1
Visits for health check-ups per employee	0.64	0.55	−14	0.54	0
Laboratory tests for primary care per employee	1.62	2.4	+48	2.2	−9
Radiographic tests for primary care per employee	0.22	0.24	+9	0.23	−3

Source: Kela.

Table 4. *Changes (in percentage, %) in total number of visits for primary care and health check-ups and number of visits per employee between 2005 and 2008.*

	Physician	Nurse	Physio-therapist	Psycho-logist	Specialist clinician
Visits for primary care	+14	+5	−11	−42	+29
Visits for primary care per employee	+5	−3	−18	−38	+20
Health check-ups	+7	+4	+3	+64	+32
Health check-ups per employee	0	−3	−4	+45	+22

Source: Kela.

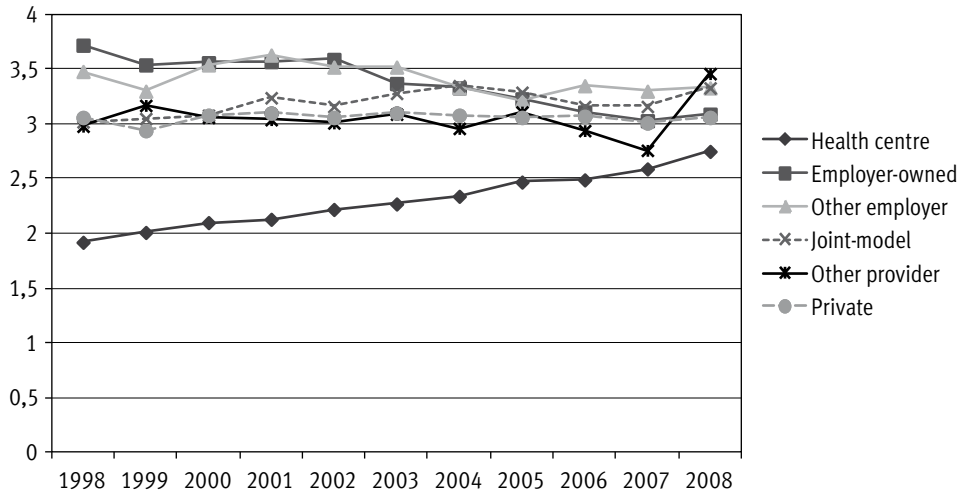
The proportion of employees having access to primary care in OHS was over 95% in all OHS providers other than in municipal health centres in which the proportion increased from 56% in 1996 to 75% in 2005. In 2008 it was 79%. Between 1998 and 2005 visits for primary care per employee increased most in the OHS units of municipal health centres (29%), and decreased in employer-owned OHS units (13%). The same trend continued in 2008 (Table 5). However, in 2007 and 2008 the OHS of the state were divided into actual providers, and the group "other provider" is not the same as in the previous years. The number of visits per employee to physicians and specialist clinicians was the highest in private clinics and in the group of other providers. The number of laboratory tests for primary care per employee increased 48%, and radiographic tests 9% between 1998 and 2005. The increase occurred mostly in the health centres. In 2008 a decrease was seen in the number of diagnostic tests conducted in both health centres and employer-owned OHS units (Table 5). In private clinics the number of tests increased. The trends in the changes of number of visits, health check-ups, and diagnostic tests are shown in figures 2, 3, 4, and 5 (pp. 45–46).

Table 5. *Change (in percentages, %) of number of visits and diagnostic tests for primary care per employee according to providers between 2005 and 2008.*

	Municipal health centre	Employer-owned	Owned by another employer	Joint-model	Private clinics	Other
Visits for primary care per employee	+11	−4	+3	+1	0	+11
Health check-ups per employee	+5	−2	+5	−5	+5	+41
Laboratory tests for primary care per employee	−18	−9	+9	+1	+6	−32
Radiographic tests for primary care per employee	−14	−2	+10	−14	+2	+3

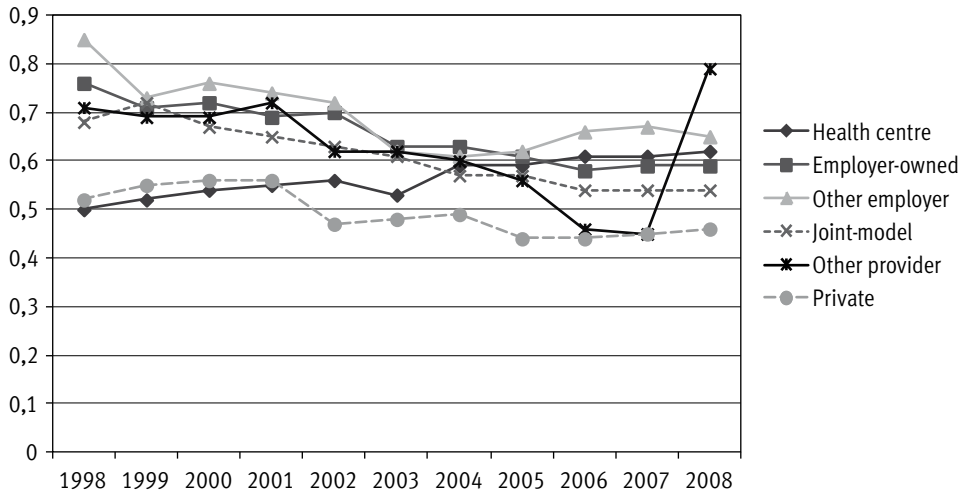
Source: Kela.

Figure 2. *Visits for primary care per employee according to the OHS provider.*



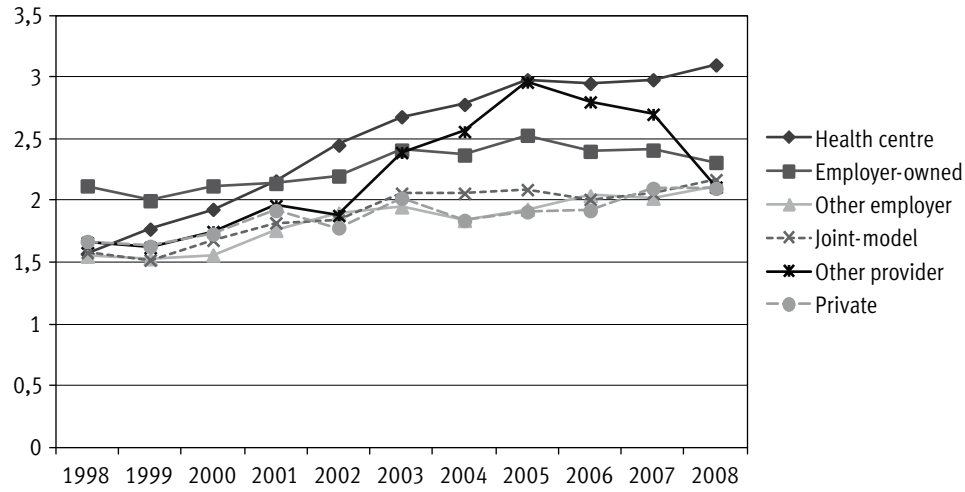
Source: Kela.

Figure 3. *Health check-ups per employee according to the OHS provider.*



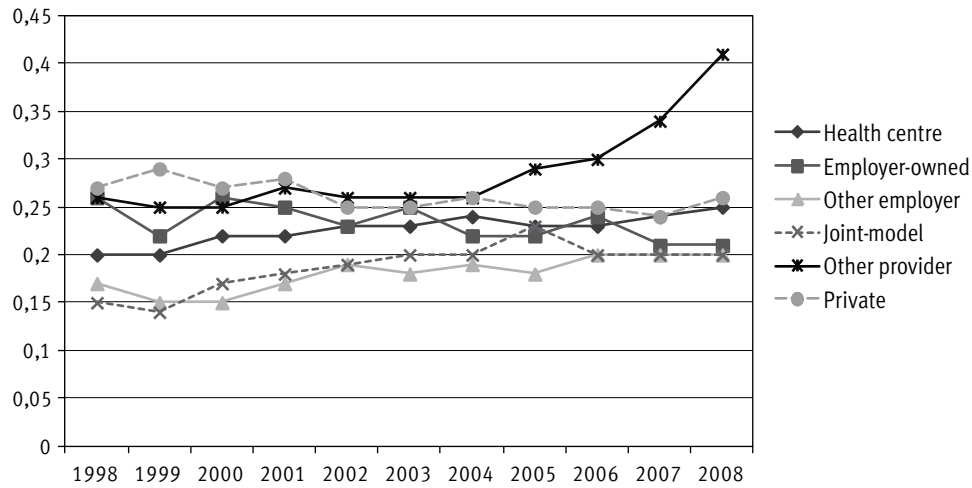
Source: Kela.

Figure 4. *Laboratory tests for primary care per employee according to the provider.*



Source: Kela.

Figure 5. *Radiology tests for primary care per employee according to the provider.*



Source: Kela.

The expenses of primary care per employee converted to 2005 Euro value increased by 23%, and the expenses of preventive activities increased by 29%. The increase in total OHS expenses (category I: 58% and category II 63%) was similar to the increase in public health care (57%) but less than the increase in public primary health care (78%). The proportion of primary care of total OHS expenses was between 60.5% and 61.8%. In 2008, the proportion was 62%. The proportion was highest in private clinics (66%) and lowest in health centres (57%) in 2005. Of the primary care expenses, the proportion from physicians' visits was highest, and had increased from 32% to 40%

in 2005. Laboratory test expenses of were second highest, at 18%, and had increased by 2%.

Study II. The study population comprised full- or part-time working employees (n = 3126). During the previous 12 months, 78% of the study population (those whose information was missing were regarded as non-users) had consulted an OH nurse or OH physician, municipal health centre, or hospital outpatient clinic; 70% had consulted OHS or a municipal health centre;, and 51% had consulted only OHS. The main contacts for primary care for employees were OH nurses, OH physicians, and HC physicians.

Study III. Visits to physicians, including OH physicians, HC physicians, private physicians, hospital outpatient clinic physicians, and other physicians in the previous 6 months were calculated among the whole study population (n = 3122) according to OHS arrangements. Working persons not covered by OHS (n = 335) had the lowest number of visits to physicians (1.4). However, they visited HC physicians twice (0.8) as often as employees having primary care in OHS (0.4). Persons not working (n = 893) had the highest number of visits to physicians (2.3). Respondents covered by OHS providing primary care (n = 1753) visited OH physicians more often (0.9), but visited other physicians less than the other groups. The total number of visits in this group was 1.9. The number of visits of those subjects who were covered by OHS but not by primary care in OHS (n = 141) was 2.0.

OHS provision in joint-model OHS units and private OHS clinics was associated with more visits to OH physicians. Another factor related to the OHS system was access to OHS. Access to OH nurses was not associated with visits to physicians. Inadequate access to OH physicians was associated with visits to HC physicians and private physicians only among women. In private clinics, good or excellent access to OH nurses was reported by 79% and to OH physicians 76% of subjects, whereas in municipal health centres the proportions were the lowest, 64% and 50%, respectively.

Study IV. The study population comprised employees covered by primary care in OHS (n = 1636). Overall, 57% of employees visited either OH nurses or OH physicians during the previous 6 months. The proportion of women who visited OH physicians was higher than that of women who visited OH nurses. According to the OHS provider, the proportion of employees who visited OH physicians was higher than that of employees who visited OH nurses in the OHS units of private clinics. The proportion of men (54%) and women (57%) who visited OH physicians was highest in private OHS clinics. The proportion of employees who visited OH nurses and OH physicians was lowest in municipal health centres. Women visited OH physicians more often than OH nurses, particularly in private OHS clinics. The total number of men's visits to OH nurses was higher than that of women, but the number of visits to OH physicians did not differ. Men visited OH nurses more than women in all other types of OHS except municipal health centres, where women made more visits to OH nurses and OH physicians than men.

Table 6 shows a summary of the number of visits and the proportion of employees who made visits in Studies II, III, and IV.

Table 6. *Number of visits to different physicians and nurses (means) (during the past six months in Studies III and IV) and proportions (%) of subjects who made visits to physicians and nurses among subjects in Studies II (during the past twelve months), III, and IV (S II, S III, S IV).*

	Men		Women	
	Number of visits (S III / S IV)	**Men who made visits (S II /S III /S IV), %**	**Number of visits (S III / S IV)**	**Women who made visits (S II / S III / S IV), %**
Occupational health physician	0.9 / 0.93	38 / 43 / 46	0.9 / 0.97	42 / 46 / 47
Health centre physician	0.3 / –	28 / 17 / –	0.4 / –	42 / 25 / –
Private physician	0.2 / –	15 / 12 / –	0.4 / –	35 / 28 / –
Hospital outpatient clinic physician	0.2 / –	16 / 11 / –	0.3 / –	23 / 16 / –
Health centre nurse	– / –	9 / – / –	– / –	15 / – / –
Occupational health nurse	– / 1.05	44 / – / 44	– / 0.84	46 / – / 39

Gender differences were studied further in Studies II, III, and IV. In study II, men contacted OH nurses as often as women. However, women consulted other health care services significantly more often. The proportion of participants, who reported primarily consulting an OH physician for health problems was 45% for men and 43% for women. HC physicians were primarily contacted by 20% of men and 29% of women, and 26% of men and 20% of women did not report contacting a primary physician. An OH nurse was the primary nurse consulted by 42% of men and 43% of women, and 52% of men and 46% of women did not report contacting a primary nurse.

In study III, among working people (employees and entrepreneurs) covered by primary care in OHS both genders visited OH physicians more often than other physicians. Men and women made an equal number of visits to OH physicians (0.9), but women more often to other physicians. No difference by gender in the proportion of those having visited OH physicians as opposed to health centre physicians, private physicians, and hospital outpatient clinic physicians was found. The proportion of men who made visits to OH physicians was 43%, and the proportion of women, 46%. The proportion of all visits to OH physicians was 56% among men and 45% among women.

Study V. OH physicians assessed 1% of primary care visit patients to be independently treatable by OH nurses, and recommended follow-up visits to OH nurses in 6%.

5.2 Connections between health problems / health risks (lifestyle factors) and primary care visits in OHS (Studies II–V)

Health problems included in the study comprised perceived health compared with that of people of the same age, chronic illnesses, MSDs, depressive mood, stress symptoms, burnout, and insomnia. Health risks comprised smoking, physical inactivity, obesity, and hazardous alcohol consumption.

Men had significantly higher alcohol consumption and smoked more often, and they reported less leisure time physical activity than women (Study II). Women reported depressive symptoms and depressive disorders more often than men. The prevalence of obesity, burnout, and insomnia were similar for both genders.

The main reasons for consulting OH physicians for primary care (Study V) were musculoskeletal (22%), mental (14%), respiratory (13%), and circulatory disorders (11%). Symptoms not categorized were the main reason in 7% of cases. Disorders of the endocrine, nervous or digestive systems were the main reason each in 5% and skin disorders and injuries in 4% of the visits.

Among the employed persons with access to OHS primary care (Study III), chronic illnesses which did not affect work ability were associated with visits to OH physicians among men and visits to private physicians among women. When the self-employed were excluded (Study IV), chronic illnesses were associated with visits to OH physicians among women as well. Associations were also found with visits to OH nurses.

Approximately half of those with MSDs visited OH physicians within the previous 12 months. Of women, over 40% visited HC physicians and of men, over 30%. MSDs were associated with visits to OH nurses and HC physicians among men and with visits to OH physicians among women (Study II) (Table 7, p. 50).

Employees with insomnia or burnout consulted OH nurses, and women consulted OH physicians, significantly more often than those without these health problems. Depressive symptoms were related to a higher proportion of men (40%) consulting OH nurses. Among women, those with depressive symptoms or a depressive disorder consulted OH nurses significantly more often (about 40%) than those without (31–33%). Close to half of the depressive women and over 40% of depressive men had visited OH physicians. In logistic regression analysis, insomnia and burnout were associated with visits to OH nurses among men, and insomnia and depressive mood among women. Close to 40% of women and a third of men with mental health problems also visited HC physicians (Study II).

Moderate psychological stress increased visits to OH physicians among men and women, and among women also to HC and private physicians (Studies III, IV).

Table 7. *Adjusted rate ratios (RR) and odds ratios (OR) and their 95% confidence intervals (CI) of primary care visits to OH nurses and OH physicians by gender in logistic regression analysis adjusted for age (Study II) and multivariate Poisson regression analysis (Studies III and IV) adjusted for age and all other variables in the model.*

	Occupational health nurse		**Occupational health physician**	
	Men	**Women**	**Men**	**Women**
Study II	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Burnout				
Yes	1.38 (1.08–1.75)	1.25 (0.99–1.58)	1.09 (0.81–1.46)	1.24 (0.98–1.56)
No	1.00	1.00	1.00	1.00
Insomnia				
Yes	1.45 (1.13–1.87)	1.36 (1.08–1.71)	1.00 (0.72–1.39)	1.26 (0.96–1.66)
No	1.00	1.00	1.00	1.00
Depressive symptoms				
Severe	1.39 (0.76–2.55)	1.88 (1.24–2.86)	0.82 (0.40–1.65)	1.40 (0.90–2.19)
Moderate	1.41 (0.99–2.02)	1.31 (1.00–1.71)	0.89 (0.56–1.42)	1.08 (0.83–1.40)
No	1.00	1.00	1.00	1.00
Depressive disorder				
Yes	1.75 (0.99–3.08)	1.51 (1.05–2.19)	0.88 (0.45–1.71)	1.21 (0.83–1.76)
No	1.00	1.00	1.00	1.00
Musculoskeletal disease				
Yes	1.45 (1.16–1.83)	1.25 (0.99–1.57)	1.11 (0.86–1.44)	1.37 (1.08–1.74)
No	1.00	1.00	1.00	1.00
Study III	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
Stress symptoms				
Rather much, much	...	...	1.04 (0.67–1.63)	1.22 (0.88–1.69)
To some extent	...	...	1.54 (1.16–2.04)	1.37 (1.07–1.77)
Only a little	...	...	1.19 (0.89–1.74)	0.96 (0.73–1.26)
Not at all	...	...	1.0	1.0
Study IV	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
Perceived health				
Poor	0.92 (0.73–1.16)	1.87 (1.42–2.45)	1.21 (0.93–1.58)	1.92 (1.47–2.49)
Quite good	0.78 (0.62–0.97)	1.40 (1.09–1.79)	1.14 (0.88–1.46)	1.36 (1.07–1.74)
Very good	1.0	1.0	1.0	1.0
Psychological stress				
Severe	1.02 (0.77–1.34)	1.13 (0.87–1.47)	0.91 (0.67–1.24)	1.21 (0.96–1.54)
Moderate	1.00 (0.84–1.20)	1.01 (0.84–1.20)	1.33 (1.10–1.59)	1.33 (1.13–1.57)
No	1.0	1.0	1.0	1.0

Women with some of the health risks, the proportion of those who visited OH physicians and HC physicians were approximately 40%. Over half of the women with abusing alcohol had visited OH physicians during the previous year, and more frequently than visiting OH nurses or HC physicians (a third).

Among men, smokers consulted OH nurses and OH physicians less and HC physicians more than non-smokers. In the logistic regression analysis the associations remained after adjusting for education. Physically active men visited OH physicians more often than the inactive, and physically active women visited OH nurses more often than the inactive. The proportion of obese employees (BMI over 30) visiting OH nurses was higher than among those with a BMI under 30. As well as in the logistic regression analysis obesity was associated with visits to OH nurses.

5.3 Connections between work-related health problems / changes in work ability and primary care visits in OHS (Studies II–V)

Among both genders, employees with chronic illnesses impairing work ability visited OH nurses more than those without these illnesses. Consultations with OH physicians were also more frequent among women. Approximately half of the employees with these illnesses consulted OH physicians and about half of the women also consulted HC physicians. Of men, about a third consulted HC physicians. In the logistic regression analysis (Table 8, p. 52) chronic impairing illnesses were associated with visits to OH nurses and HC physicians among men and with visits to OH nurses and OH physicians among women (Study II). Among those with access to OHS primary care, in the logistic regression analysis chronic impairing illnesses were associated with visits to OH nurses, OH physicians, HC physicians, and among men to private physicians.

Work-related symptoms were strongly associated with visits to OH nurses and OH physicians. A total of 73% of the women who reported work-related symptoms had visited either an OH nurse or OH physician, and among men the percentage was 65%. Of women who reported chronic illnesses impairing work ability 84% had visited OH nurses or OH physicians, and of men 67% (Studies III, IV).

The proportion of employees with a poor work ability index who visited OH nurses and OH physicians was significantly higher than that of those with good work ability. Among men, this proportion was also significant regarding visits to HC physicians. Over 50% of those with a poor work ability index had visited OH physicians. A poor work ability index was associated with visits to OH nurses and HC physicians among men and OH nurses and OH physicians among women (Study II).

In the examination of 651 visits to OH physicians for primary care (Study V), 54% of visits were for work-related health problems. These were induced or worsened by work, or had caused impaired work ability resulting in sickness absence. The main reason for the visit was significantly work-related more frequently among women,

blue-collar employees, and for those who were at risk for permanent disability or in need of rehabilitation. Visits were work-related more frequently with mental, musculoskeletal, and neurological disorders and injuries.

Of all main reasons for visits, OH physicians assessed 6% as mainly work-induced, and 12% partly work-induced (Study V). In 8% of cases, symptoms of the illness worsened at work. The illness caused disability for up to two weeks in 14% of visits and over two weeks in 7%. In 31% the illnesses impaired work ability but employees could continue working. The episodes of disability leading to sickness absence were caused partly or mainly by work-induced reasons in 20% and in 17% of visits, respectively. OH physicians reported 10% of visits which patients had made an appointment for primary care as an assessment of work disability or rehabilitation in character.

Table 8. *Adjusted rate ratios (RR) and odds ratios (OR) and their 95% confidence intervals (CI) of primary care visits to OH nurses and OH physicians by gender in logistic regression analysis adjusted for age (Study II) and in multivariate Poisson regression analysis (Studies III and IV) adjusted for age and all other variables in the model.*

	Occupational health nurse		**Occupational health physician**	
	Men	**Women**	**Men**	**Women**
Study II	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Chronic impairing illness				
Yes	2.00 (1.61–2.49)	1.50 (1.23–1.82)	1.19 (0.92–1.53)	1.49 (1.19–1.87)
No	1.0	1.0	1.0	1.0
Work ability index				
Poor	2.40 (1.80–3.20)	1.72 (1.33–2.23)	1.29 (0.93–1.78)	1.65 (1.22–2.22)
Good	1.0	1.0	1.0	1.0
Study III	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
Long-standing illness				
Yes, affects work	...	...	2.13 (1.61–2.82)	2.29 (1.80–2.92)
No effect on work	...	...	1.37 (1.06–1.79)	1.24 (0.98–1.57)
No long-standing illness	...	...	1.0	1.0
Study IV				
Long-standing illness				
Yes, harmful to work	2.44 (1.99–2.99)	1.37 (1.09–1.72)	2.03 (1.63–2.53)	2.12 (1.74–2.58)
No harm on work	1.66 (1.38–1.99)	1.12 (0.92–1.35)	1.38 (1.14–1.68)	1.32 (1.10–1.59)
No long-standing illness	1.0	1.0	1.0	1.0
Work-related symptoms				
Yes	1.33 (1.12–1.58)	1.21 (1.02–1.44)	1.40 (1.17–1.68)	1.48 (1.26–1.74)
No	1.0	1.0	1.0	1.0

Of all reasons for disability, 32% were for mental and 28% for musculoskeletal disorders. Mental health reasons caused 53% and musculoskeletal reasons 30% of disability lasting over two weeks. Mainly work-induced disability was in 33% of the cases due to mental and in 8% due to musculoskeletal reasons. Sickness absence was required in 47% of the visits made for mental reasons, and in 38% of the visits for musculoskeletal reasons. In MSDs, work induced or worsened symptoms for 38% and in mental disorders for 68% of the cases. This study suggests that the main work-related health problems were mental disorders for white-collar employees and musculoskeletal disorders for blue-collar employees. Due to the small sample, the differences could not be tested by statistical methods.

5.4 Connections between sociodemographic and workplace-related factors and primary care visits to OHS (Studies III–V)

Of the sociodemographic factors, age, gender, education, and income were examined in the study. The results on the use of OHS by gender have presented in section 5.1. The proportions of persons who visited OH physicians and HC physicians were higher among women aged 55–64 years, while in Study II the proportions of those who visited OH nurses were higher among men aged 45–55 years. However, age was not associated with visits to OH physicians in Study III. Younger women visited HC physicians and private physicians more frequently than older women.

Basic and secondary levels of education were associated with HC physician consultations among both men and women (Study II). Among those who had access to OHS primary care (Study III), a lower level of education was associated with visits to OH physicians among women and HC physicians among men.

Among employees covered by OHS primary care, income was not associated with visits to OH physicians, but lower income was associated with visits to HC physicians among women and inversely associated with visits to private physicians among men (Study III).

Workplace-related factors included in this study were size of organization and presenting a sickness certificate from the first day of sickness. The included psychosocial factors, i.e.,workplace harassment, possibilities to influence one's work, and support from co-workers and supervisors, correlated in the correlations tests with the use of OHS and were chosen for further analysis.

The size of employees' workplaces were not associated with the visits to physicians (Study III). The requirement of the workplace for a sickness certificate from nurses or physicians from the first day of sickness was associated with increased visits to OH physicians (36%) among men.

Workplace harassment was associated with visits to OH physicians, and to private physicians among women. Influence on one's work was not associated with visits to physicians among the employed which included entrepreneurs (Study III). Among employees with access to OHS primary care (Study IV), lack of influence on one's work was associated with visits to OH nurses, but to OH physicians only among women. Poor support of co-workers was associated with fewer visits to OH nurses and among men also to OH physicians. Poor support from supervisors also had inverse associations with visits to OH physicians among women.

5.5 Prevention and interventions in primary care visits to OH physicians' practices (Study V)

OH physicians reported that they promoted health in 47% of visits, and the percentage was the same regardless of the work-relatedness of the visit. The advice concerned physical exercise in 26%, nutrition in 16%, weight control in 8%, coping with stress in 7%, and coping with other life problems in 6% of visits.

OH physicians obtained new information about the work or workplaces of employees in 27% of visits. When the visit was not work-related the proportion was 17%, and when it was work-related, this increased to 57%. OH physicians intended themselves to follow the workplace situation on the basis of new information in 80% of cases, and in addition to inform other OHS professionals in 22% of cases. Documentation of the information in the OHS unit's enterprise files took place only in a few cases. OH physicians assessed the need to inform an employer in 1% of the cases.

OH physicians gave recommendations concerning work or workplace in 21% of the visits. In work-related visits the proportion was 54%. These interventions comprised giving advice in 17% of the visits, and other recommendation in 10%. A recommendation to speak with the employee's supervisor about matters concerning work was given in 4% of the visits and to arrange a meeting between OHS, the employee and the supervisor in 3%. Only a few recommendations concerned workplace visits by OHS, and adaptations of work as well as work reassignments.

The associations between work-related interventions by OH physicians and the explanatory variables were examined by logistic regression analysis. Physicians' knowledge of the work, employees' risk for permanent disability, and need for rehabilitation were associated with interventions. In addition, when symptoms of the health problem had occurred over two weeks before consultation the need for intervention increased. The need for intervention also increased significantly when physicians gained new information about the work, workplace, or working conditions from patients during visits. Of the diseases, mental disorders were associated most strongly with interventions. MSDs and disorders of the nervous system were also significantly associated with interventions. The strongest association was with work-related visits, when the reasons for visits concerned work and the patient needed sick leave.

6 DISCUSSION

The purpose of this study was to determine the position of OHS primary care in the Finnish health care for working population and the factors associated with the use of primary care in the OHS. As the coverage has increased the focus was on the changes in the provision of OHS services, in the delivery of primary care, and in the work of OH nurses and physicians. In addition, the aim was to study how the special features of OHS primary care are achieved in relation to health, work, work ability, and preventive activities in primary care visits. The aim was also to assess the need for further developing OHS as well as good practices in OHS primary care.

6.1 Main findings

6.1.1 Use of OHS for primary care among working men and women, activities of OH nurses and OH physicians, OHS provision, and primary care expenses in OHS

The provision of primary care in the OHS and the number of workers having access to primary care in OHS increased markedly from 1996. However, this study shows that the visits to OHS for primary care per employee decreased. The provision of primary care in the OHS has increased particularly in municipal health centres, which indicates that the OHS units in municipal health centres have changed to functioning in a similar way as other OHS providers (Pulkkinen-Närhi et al. 2004). The physicians' share of primary care in the OHS increased and the nurses' share decreased. The study does not reveal reasons for this, or if the trend is appropriate regarding the division of work between OH physicians and OH nurses. However, the trend might lead to minor illnesses being treated by physicians. Earlier, OH nurses had a major role to directing patients to OH physicians and nowadays the trend is for patients themselves to make appointments to physicians via internet. However, OH physicians assessed that only a small proportion of primary care visits to them were such that OH nurses could have treated the patient independently.

In the OHS units of private clinics, visits to physicians per employee and the proportions of those who visited OH physicians were the highest. This may be due to the superior resources of physicians in private OHS clinics (Manninen 2009). Good access has been found to be an important factor in the use of OHS in a Dutch study (Plomp 1996). In addition, the proportion of private clinics in Finland has increased (Manninen 2009), so this may be one reason for the increase of primary care in physicians' OHS work.

The two nationally representative study populations showed that over half of the working persons visited OHS during the previous 6 or 12 months and did not use other health care. The more recent study showed that 80% of the patients who visited municipal health centres or OHS consulted OH professionals for primary care within the previous year (Virtanen and Mattila 2011). The higher proportion compared to this study is probably a result of different inclusion criteria. Virtanen's study com-

prised those who used services whereas this study also comprised those who did not use services.

The total number of visits to physicians in health care was about the same among employees covered by primary care in the OHS as among those employees who were not covered, as they used other health care more than the OHS. This confirms the earlier finding that when OHS are arranged, OHS primary care does not increase the total use of health care (Räsänen et al. 1993).

The expenses of providing OHS primary care have increased (63%) from 1996 to 2005, an increase of 23% per employee, which seems quite reasonable as at the same time the increase in other primary health care expenses was 78%. Although the volume of the OHS services has increased, the proportion of primary care of total OHS expenses has remained quite stable: from 1996 to 2005 between 60.5% and 61.8%. In the statistics from 2008, the proportion was 62.2% (Kela 2010a). The employers pay over half the expenses of providing OHS by themselves and the rest is reimbursed by Kela from the insurance funds collected from wage-earners and employers (Sickness Insurance Act 2004). Thus OHS financing is not based on taxation. In addition, employers pay for some health care for their employees which is not reimbursed by Kela. OHS primary care seems to be financially effective for society considering the remarkable number of visits to the OHS, and discontinuing OHS primary care might have unpredictable consequences in public health care (Mattila 2011).

Among the whole working population, men visited OH nurses as often as women, but women consulted other health care services more often. Several studies have suggested that women use health care services more than men (Räsänen et al. 1993; Green and Pope 1999; Lahelma et al. 1999; Ladwig et al. 2000; Parslow et al. 2004a). This study showed that when working persons had access to OHS primary care, men visited OH physicians as often as women and visited OH nurses even more frequently. Thus, the OHS seem to have a low threshold for men to use health care services, and this confirms the earlier finding that OH physicians were visited equally by male and female employees (Räsänen 1998). Inadequate access to OH physicians was associated with visits to HC physicians and private physicians among women, but men do not seem to compensate by using other health care.

6.1.2 Connections between health problems / health risks (lifestyle factors) and primary care visits to OHS

About half of the women and 40% of the men with MSDs, depressive symptoms or disorder, hazardous alcohol consumption, insomnia or burnout visited OH physicians during the previous year in the study population drawn from the Health 2000 Study. Visiting OH nurses was slightly less frequent. The proportions are higher than for those who actually sought help for major depressive disorders or MSDs (Honkonen et al. 2007; Kaila-Kangas 2007).

Depressive mood was more prevalent among women, as was hazardous alcohol consumption among men, but the prevalence of burnout was similar. This suggests that screening for burnout might reveal work-related mental health problems among men as well. Psychological stress was also found to increase visits to OH physicians if the employed had access to OHS primary care, in a study population drawn from the Work and Health Survey. Thus OH professionals had the possibility to detect mental health problems even if they were not the reason for visits. Insomnia, psychological stress, and burnout are often work-related and precede major mental problems which can lower work ability and cause sickness absence (Linton 2004; Sivertsen et al. 2006; Ahola et al. 2009a and b). The advantage of treating MSDs and mental health problems within the OHS is that OH professionals can intervene in the work and workplaces when the problems are work-related, as stipulated in law.

Several studies have found that only about 12% of persons with an alcohol problem seek treatment for their alcohol problem from health services (Bijl and Ravelli 2000; Wu and Ringwalt 2004; Honkonen et al. 2007). This study showed that about half of the women and a third of the men who abused alcohol or were alcohol-dependent visited OH nurses or OH physicians for some reason. In a Finnish study in an OHS setting, almost a third of the men contacting OH physicians were heavy drinkers (Kaarne et al. 2009). Alcohol can therefore be behind many health problems, and alcohol consumption should be actively inquired about by OH professionals in primary care visits and brief interventions should be made when needed.

With regard to good practice within OHS primary care, it is clear that working persons with health issues such as mental health problems and MSDs, which are major causes of disability, seek help from OHS. However, about over half of those with MSDs, mental health, or alcohol problems do not use OHS primary care or any other health care. Some do not perceive a need for treatment (Wu and Ringwalt 2004) and some do not for other reasons seek treatment. The OHS should use other methods such as health check-ups and surveys to locate these employees (Taimela et al. 2007).

6.1.3 Connections between work-related health problems / changes in work ability and primary care visits to OHS

The study showed that a majority of employees with work-related health problems and impaired work ability consult mainly OH professionals.

Among employees with access to OHS primary care, a quarter of women and a third of men reported symptoms which were caused by work or worsened at work. Of these, over two-thirds visited OH physicians or OH nurses. This indicates that OH professionals may effectively obtain information regarding working conditions during OHS primary care visits. The study confirms the earlier finding of the association between work-related symptoms and visits to OH physicians (Räsänen et al. 1993).

This study showed that in private OHS clinics over half of primary care visits to OH physicians might be work-related. A quarter of the main health problems were caused partially or mainly by work assessed by OH physicians. This is a little less than in an earlier finding (34%) (Martimo 2010). When work ability was measured by sickness absence, over half of the visits were work-related. In addition, OH physicians assessed that 10% of the appointments for primary care were assessments of work ability or rehabilitation. This study showed that musculoskeletal and mental health problems are important in OH physicians' practices as in over half of such cases work caused or worsened symptoms and most longer sickness absences were issued due to these disorders. In earlier studies, work-related conditions have been found to be more common in OH physicians' practice than in general practice (Weevers et al. 2005; Won and Dembe 2006).

Chronic illnesses impairing work ability were associated with visits to OH nurses or OH physicians both in the study population drawn for the Health 2000 Study and the Work and Health Survey. A majority of those having such an illness visited OH nurses or OH physicians in the preceding six months among those employees with access to OHS primary care. Among the study population drawn from the Health 2000 Study the associations were stronger with visits to OH nurses. As well, the poor work ability index was associated with visits to OH nurses or OH physicians.

The findings of this study suggest that OH professionals have an opportunity during primary care visits to identify individuals with impaired work ability and work-related health problems and take measures to support them according to the guidelines of good practice in OHS. OH nurses seem to play an important role in identifying impaired work ability and directing patients to OH physicians.

6.1.4 Connections between sociodemographic and workplace-related factors and primary care visits to OHS

Of sociodemographic factors, the effects of gender have already been discussed in Section 6.1.1. The associations between primary care visits with age, education, and income were not constant in the two population-based studies. Among men, age was not associated with visits to OH physicians in either study. When working persons had access to OHS primary care age was not associated with visits to OH physicians also among women.

Low income and a low level of education seems to be associated with visits to HC physicians, though associations regarding lower education were also detected in visits to OH physicians among women when they had access to OHS. Income was not associated with visits to OH physicians among those who had access to OHS primary care. The probability of health care use in Finland has been associated with high-income groups in previous studies (van Doorslaer et al. 2000; Häkkinen 2002).

The use of OHS is cost-free for employees, and how this affects the use of OHS or other health care was not examined in this study. The OECD has determined that OHS causes inequities in the Finnish health system (OECD 2005). The employed population has access to free OHC whereas the unemployed have access only to HC physicians whose services carry charges. According to the OECD report, it would make sense to give the working population good access to primary care, especially as the workforce is ageing. The recommended measures should increase the availability and responsiveness of physicians in the municipal health centres.

Of workplace-related factors, the size of the workplace was not associated with visits to OH physicians, contrary to an earlier study which found that employees of larger enterprises visited OH physicians more often (Räsänen 1998). The employer's requirement of a sickness certificate from the first day of absence was associated with visits to OH physicians among men, as in an earlier study (Räsänen et al. 1993). Still, 39% of men needed to certify sickness absence from the first day of sickness. The relevance of the practice of certifying short absences is questionable, as these visits are probably mostly for acute infections and supervisors could be informed by their employees and guide them to OHS if needed. In addition, acute infections rarely are caused by work and therefore these cases would not need work-targeted interventions by OH physicians.

The work-related psychosocial factors included in this study were workplace harassment, influence on work, and support from supervisors and co-workers. The study found the prevalence of workplace harassment to be 11%. Earlier Finnish studies have reported it being between 5% and 16% (Kivimäki et al. 2000; Varhama and Björkqvist 2004). Workplace harassment was associated in this study with visits to OH physicians among women. The crude associations would indicate that men, too, may consult an OH physician in the case of workplace harassment. Workplace harassment has been found to be associated with sickness absence and depressive symptoms (Kivimäki et al. 2000 and 2003). Therefore recognizing it through the OHS is important.

Lack of influence on one's work was associated with visits to OH nurses, and among women also to OH physicians. Among employees who experienced poor support from co-workers or supervisors, surprisingly, visits to OHS decreased. Earlier, reduced social support from a supervisor was associated with increased health care use but social support from co-workers was not (IJzelenberg and Burdorf 2005). Associations between the use of other health care were not examined in this study. In conclusion, poor control over work seems to be a more relevant factor than poor social support at work when visiting OHS.

6.1.5 Prevention and interventions in primary care visits to OH physicians' practices

In the present study health promotion and work-related interventions were examined as indicators of preventive activities. OH physicians assessed that they promoted health

in almost half of the visits for primary care. They gave recommendations concerning work or the workplace in 21% of the visits and in 54% of the work-related visits.

Health promotion by OH physicians in primary care visits mainly involved exercise and diet counselling, which were also the most common in general practice (Chernof et al. 1999; Ma et al. 2004). The proportion of visits when health was promoted by OH physicians was at an average level compared to earlier findings in general practice (Stange et al. 1998; Flocke et al. 1998; Chernof et al. 1999; Wilson and Childs 2006). Discussing smoking and alcohol consumption was infrequent during visits for primary care. The study was cross-sectional and patients were mostly familiar to the OH physicians, and these issues could have been dealt with during previous primary care visits or health check-ups. The issue of health promotion received within the OHS should be further inquired about from patients in future studies.

Work-related interventions in this study consisted of advice and counselling on work-related issues, recommendations to speak with supervisors about matters concerning work, recommendations to arrange meetings between employees, supervisors, and the OHS, workplace visits, modifications of work, and reassignments. The proportion of work-related interventions in OHS primary care visits was higher (in 21% of visits) in this study than in a study carried out in 1989–1991 (8.8%) (Räsänen et al. 1997). Another Finnish study showed that in the OHS unit of a chemical factory interventions were made in 37% of visits, and in the OHS unit of a municipal health centre in 19% of visits, for work-related (caused or worsened by work) health problems (Martimo et al. 1995). In this study the proportion was even higher (54%) in the visits for work-related health problems, but this may be due to a different concept of work-relatedness.

In Räsänen's study MSDs were a significant estimator for a work-related intervention compared with the diagnosis categories of respiratory diseases, diseases of the nervous system, and injuries (Räsänen et al. 1997). In this study, work-related interventions were associated not only with MSDs, but also mental health disorders, and disorders of the nervous system. The differences in the number of interventions in these studies may be due to the different distribution of disease categories as main reasons for the visits and the different distribution of industries.

The experience of OH physicians has earlier been associated with the rate of interventions (Räsänen et al. 1997). The higher rate of interventions in this study may thus also be due all of the OH physicians having had extensive experience in OHS. In a Dutch OHS system in which OH physicians focus on disability management and returning employees to work after illness, the physicians contacted employers more often than in this study (Anema et al. 2006). Other common interventions of Dutch OH physicians included advice and initiatives for modifying the employee's working conditions.

OH physicians' knowledge of work, employees' risk of permanent disability, and need of rehabilitation were associated with interventions. In addition, the length of time from the beginning of symptoms to the consultation was associated with interven-

tions. Symptoms lasting over two weeks before consultation increased the need for interventions. These results indicate that OH physicians have a particularly special position in supporting employees' work ability in primary care. The advantage compared to general practice is their connections to workplaces and knowledge of the work. Dutch studies have found that GPs discussed working conditions less often than OH physicians, seldom contacted employers and never recommended work-related interventions (Anema et al. 2006; Weevers et al. 2009).

This study found that OH physicians focused most interventions on individual employees during primary care visits. Thus increasing contacts with employers might also increase effectiveness of OH physicians' interventions in preventing work disability.

Health promotion and counselling often result in longer consultations (Wilson and Childs 2002). When time is short, this may reduce the practice of OH physicians counselling patients and informing other OH professionals of workplace changes.

When OH physicians received new information on workplaces during primary care visits they transferred this information to other OH professionals in only 22% of cases, and the documentation of this was infrequent. The electronic patient record systems should support the transmitting of necessary new information about workplaces to other OH professionals, so that they might also follow the possible consequences of changing working conditions.

6.2 Methodological considerations

6.2.1 Study populations

The strength of this study was that two large population-based representative samples were used. In Study II the subjects were drawn from a multidisciplinary epidemiological study, the Health 2000 study, carried out in 2000–2001 in Finland. The original two-stage stratified cluster sample was representative of the Finnish population aged 30 and over. The participation rate was very high: at one stage of the data collection the participation was 93%, for the interviews 89%, and for the health examinations 80%. In this study 3126 currently full- or part-time employees were included. As the data from the Health 2000 Study represents the entire Finnish 30–64-year-old population and the participation rate was high, the results can be generalized in these age groups.

In Studies III and IV, the data from the Work and Health Survey 2006 conducted by the FIOH was used. The sample was randomly selected and population-based, comprising 4971 Finnish-speaking persons aged 25 to 64. The participation rate was 63%, which is quite high. The subjects were representative of the Finnish working-age population in terms of age and gender; only the proportion of respondents from Southern Finland fell below that of the average.

Study III comprised employed people with access to OHS primary care. In Study IV employees only were included, as the questions concerning support from supervisors and co-workers were not relevant to entrepreneurs. The results of Studies III and IV can be generalized to the Finnish working population covered by OHS offering primary care in the age range of 25 to 64 years. Subjects from Southern Finland were slightly underrepresented (Perkiö-Mäkelä et al. 2006) which may have some effect on the results, as OHS are even more important health care providers in Southern Finland than elsewhere (Mäntyselkä et al. 2005).

Study V's sample consisted of a total of 651 visits by employees for primary care to private OHS clinics. The limitation of this study was that the sample was quite small and not representative of all OHS units. Of those who did not participate there is no information, so some selection bias is possible. The participation rate after refusals and drop-outs due to not receiving the information and content sheets is still over 80%. The distribution of industries differed from the national distribution: employees were working mainly in the private sector, and the construction and financial sectors were overrepresented (Statistics Finland 2009b). We made comparisons only between manual and non-manual workers, so this did not affect the results.

6.2.2 Study designs and methods

Study I was based on Kela statistics from 1996 to 2005 containing OHS data on Kela's reimbursements to employers. In addition, Kela produced additional statistics for this study for the 1998–2001 period on reimbursements in which private OHS clinics were separately presented, enabling comparisons between OHS providers. This completed the earlier information. All OHS expenses are not shown in the Kela statistics, as employers may offer insurance or other health care for which they are not entitled to apply for reimbursements. Some differences may be seen between OHS providers in the division of categories of reimbursements to primary care and preventive activities, which may weaken the interpretation of the results. However, these limitations hardly affect the main results and trends found in this study. In addition, the use of the same cost index in comparison to the OHS expenses and other health care is a particular advantage of this study.

In Study II, the questionnaires, the CIDI interviews, and the examination protocols were standardly applied, based on generally accepted recommendations and nationally established practices. The CIDI interview has been found to be a valid method for the assessment of mental disorders (Wittchen et al. 1998). Musculoskeletal disorders were assessed during the physicians' clinical examinations. The Work Ability Index has been used in several studies and has proved to be a valid measurement in predicting work disability (Ilmarinen et al. 1997). In Studies III and IV, not all of the survey questions were validated, but they had been applied in three earlier Work and Health surveys conducted by the FIOH.

The prevalence of chronic illnesses impairing work ability was different between the study populations of the Health 2000 study and Work and Health 2006 study. This was due to the question upon which the answer was elaborated. The Work and Health study comprised only illnesses which were diagnosed by a physician and which lasted 3 months; the Health 2000 study also included other than diagnosed impairing conditions.

The research had certain limitations. Studies II, III, IV and V were cross-sectional, thus causal relations could not be assessed. As well Study V's interventions were not followed up on and their effectiveness could not be assessed.

Further, self-reports on health care service use were employed; those may have been vulnerable to recall bias, and may underreport the number of visits (Siemiatycki 1979). In a research, which compared health care use within the previous six months between self-reports and computerized provider records, underreporting occurred in self-reporting and was likely to increase as utilization increased (Ritter et al. 2001). In another study, for example, health service use data have been reliable regarding the quantity of services received, but the self-reporting of treatment content was found to be less reliable (Chung et al. 2008). With telephone interviews there have been more missing responses concerning mental status than with mailed questionnaires (Lungenhausen et al. 2007). More positive reporting has been reported in self-assessments of health among telephone respondents (Feveile et al. 2007).

In this research several factors were self-reported, causing possible inaccuracy. In addition, chronic illnesses impairing work ability as well as insomnia were assessed by single questions. However, subjective conceptions under these conditions are often considerable. The psychosocial factors were investigated by individual questions and no standardized methods were used, which may reduce the validity to some extent. However, the questions concerning psychosocial factors were simple, thus we can assume that any potential misunderstandings would be inconsequential.

A limitation of Study V was the small sample, which reduces the statistical power of the study. The data were gathered in one private medical clinic, so the study cannot be generalized to all OHS units in Finland. However, private OHS clinics mostly function in similar ways, so the results are suggestive regarding primary care in other private OHS clinics, which nowadays provide OHS to half of all Finnish employees (Manninen 2009). The study population did not comprise all patients visiting an OHS unit, as a part of patients were treated by GPs, thus some selection of patients was possible. Usually patients with acute illnesses are directed to GPs' consultations. The probability of work-relatedness was defined similarly to how doctors must define the causal probability in occupational diseases for insurance companies. The assessment of the work-relatedness of health problems and counselling is subjective, but it was done by experienced OH physicians with similar educations. The study could not be blinded, so the knowledge of the purpose of the study may have had some effect on the assessment of work-relatedness and interventions by doctors, and the patients also

may have emphasized work-related issues. In British studies, reliability of diagnoses of work-related mental and musculoskeletal disorders made by OH physicians compared with clinical specialists has been good (Chen et al. 2005; O'Neill et al. 2008). Compared with GP reporting, OH physicians have been shown to report higher levels of mental ill health as work-related than GPs. This may be due to differences in case mixes or reporting thresholds (Hussey et al. 2010).

7 CONCLUSIONS

1. In Finland OHS are a very important health care provider for working persons. Primary care through OHS has become more common in recent years. Over 90% of Finnish employees who have access to OHS also receive OHS primary care services. Over 50% of employees have used OHS services as the only provider of primary care during the past year. The proportion of OH visits of all physician visits in ambulatory care for those employed who had access to OHS primary care was 56% among men and 45% among women. Visits per employee have not increased, but the proportion of visits to OH physicians has. Men seem to favour OHS as a primary health care provider. OHS primary care has not increased the overall use of health care; employees seem to use OHS instead of other forms of health care. Increases in total OHS expenses have been similar to those in the rest of health care but less than those in primary health care.

2. Mental health problems, MSDs, and chronic illnesses impairing work ability were associated with visits to OHS. Some of these associations were found only with visits to OH nurses, which emphasizes their role in detecting such mental health problems as insomnia, burnout, and depressive disorders. Still at least half of those employees with MSDs, mental health problems, and hazardous alcohol consumption did not use OHS during the past year. To find these employees, OHS must use other means such as health check-ups and questionnaire surveys of all employees in the workplace. In OHS a holistic approach to employees is important in every visit. If sick leave or number of visits increase, all the significant health, behavioural or work-related factors arising from this study should be kept in mind.

3. Work-related symptoms are quite common among employees and two-thirds of those employees visited OH physicians during the previous six months. OH physicians assessed a quarter of the main reasons for consulting OH physicians as partially or mainly caused by work. Over half of the visits to OH physicians were work-related when the need for sickness absence or the assessment of work ability were considered. Poor work ability measured by Work Ability Index was associated with visits to OH nurses and OH physicians. Still, about half of those with impaired work ability measured by Work Ability Index had not visited OHS during the previous twelve months. The expertise of OH professionals in assessing the associations between work, health, and work ability seems to be important in the primary care of employees.

4. Age and income were not associated with visits to OH physicians when employees had access to OHS primary care. Education had inconsistent associations. Of the work-related factors, certifying sickness from the first day of sickness significantly increased visits to OHS among men. Workplace harassment and lack of influence on one's work was associated with visits to OH nurses or OH physicians, indicating that OH professionals have the possibility to gain information through primary care on psychosocial wellbeing in the workplace.

5. In almost half of the primary care visits, OH physicians reported that they promoted health to some degree. They gained new information concerning the work or workplace in over half of the visits if the visit was for a work-related reason. Interventions aimed at work were more common if the visit was work-related. Interventions made by OH physicians increased if OH physicians were more familiar with the employees' work. Interventions were also associated with employees' risk for permanent disability and need for rehabilitation. The need for interventions also increased when symptoms of health problems lasted over two weeks before consultation with OH physicians. Most interventions were recommendations to individuals, and a small proportion were direct contacts to workplaces.

8 POLICY IMPLICATIONS

Although OHS reach well working persons with work-related health problems and impaired work ability through primary care visits, measures supporting work ability could be increased. Primary prevention could be increased on the basis of information on workplaces which OH physicians and OH nurses gain through primary care. Secondary and tertiary prevention could be enhanced by increasing interventions focused on workplaces so that more employees with impairing health problems could remain at work or return to work. Workplace management practices concerning work ability and early support have reinforced this task after the change of reimbursement regulations in 2011. The planned proposal to require an OH physician's certificate of work ability after 90 days of sick leave will also help it.

The physicians' share of primary care visits has increased and that of nurses has decreased, during the period from 1996 to 2008. This trend might lead to a situation in which physicians treat more minor illnesses which could be treated by nurses. The employers' requirement of certifying sickness from the first day of sickness is not supported by a true need for professional consultation. The role of supervisors could be emphasized in the management of short sickness absences, while the greater role of OH nurse in primary care as well as abolishing the practice of certifying short-term sick leave could save OH physicians for secondary and tertiary prevention and workplace interventions, when work ability has decreased.

Although employees with mental health problems, MSDs, and chronic impairing illnesses mostly contact OH physicians, still about the half of them do not seek help. OHS should use other ways to reach these persons such as health check-ups, health questionnaires, and monitoring sickness absences. In addition, in the light of this study, the OH nurses' active role in detecting burnout, insomnia, and depression could be important in primary care visits. Sickness absences and disability retirement for mental disorders and MSDs have increased in recent years, and a considerable proportion of these disorders is work-related. Therefore case management and the coordinative role of OHS should be increased regarding these disorders. OHS make direct contacts to workplaces when work modifications or other measures for the workplace are necessary. OHS should aim interventions at workplaces more frequently in cooperation with employees and employers, as earlier studies have shown workplace-focused interventions to help employees remain at work or return to work.

Work-related health problems, interventions, and new information from workplaces should be documented in order to plan OHS activities and track their effectiveness. OHS information technology should support the fluent and simple reporting and documentation of the activities.

In the Finnish health care system the role of OHS in primary care is significant in taking care of the health and work ability of the employed population. The expertise of OH professionals acting in cooperation with workplaces is necessary when the

societal aim is to extend the length of working lives. Taking into account the amount of primary care provided by OHS which is financed almost totally by employers and employees, it is a financially effective mechanism for society. This is an important point when considering the renovation of the provision and financing of health care.

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ORIGINAL PUBLICATIONS

Kimanen A, Manninen P, Kankaanpää E, Räsänen K, Husman P, Rautio M, Husman K. Sairaanhoito työterveyshuollossa. Toimintalukujen ja kustannusten vertailua (Illness-related care in occupational health services in Finland. Activities and expenses 1996–2005) (abstract in English). Suom Lääkäril 2008; 63: 1965–1970.

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Sairaanhoito työterveyshuollossa: toimintalukujen ja kustannusten vertailua

Lähtökohdat Tutkimuksen tarkoituksena oli selvittää, miten työterveyshuollon sairaanhoito on kehittynyt vuosina 1996–2005, kun tarkastellaan toimintoja ja kustannuksia palveluntuottajittain.

Menetelmät Tutkimuksessa analysoitiin Kelan työterveyshuoltotilastoja vuosilta 1996–2005. Sairaanhoitoa mitattiin käyntien ja tutkimusten määrillä sekä kustannuksilla.

Tulokset Työterveyshuollon sairaanhoidon kattavuus kasvoi 91 %:iin ja sairaanhoitokäyntien kokonaismäärä lisääntyi 26 %. Työntekijää kohti tarkasteltuna sairaanhoitokäyntien kokonaismäärä väheni 5 %, mutta lääkärissäkäynnit lisääntyivät 18 %. Sairaanhoidon osuus työterveyshuollon kustannuksista pysyi 60,5–61,8 %:n välillä. Kustannukset kasvoivat työterveyshuollossa 61 %, kun koko terveydenhuollon kustannukset kasvoivat 57 %.

Päätelmät Vaikka sairaanhoitokäyntien kokonaismäärä lisääntyi seuranta-aikana, säilyi sairaanhoidon osuus työterveyshuollon kokonaiskustannuksista samalla tasolla ja kustannuskehitys vastasi muun terveydenhuollon kehitystä.

Suomessa työterveyshuolto on merkittävä työssäkäyvän väestön perusterveydenhuollon palvelujen tuottaja ja sen tarjoamalla sairaanhoidolla on pitkät perinteet. Työterveyshuollon sairaanhoidossa voidaan helposti havaita työpaikan muutostarpeet tai varhaisen kuntoutuksen tarve (1). Hyvän työterveyshuoltokäytännön mukaiseen sairaanhoitoon kuuluu sairauksien työperäisyyden arviointi, yksilön työ- ja toimintakyvyn tukeminen vaikuttamalla yksilön lisäksi myös työhön, työympäristöön ja työyhteisöön sekä työkyvyn arviointi ja kuntoutukseen ohjaaminen (2).

Työterveyshuollon voimavaroja on haluttu suunnata ennaltaehkäisevään toimintaan työterveyshuoltolain (3) ja Kelan korvausjärjestelmän muutoksilla (4,5). Korvausuudistuksessa vuonna 1995 otettiin käyttöön jako korvausluokkiin I ja II. Korvausluokkaan I kuuluu työnantajaa velvoittava, ennaltaehkäisevä toiminta ja korvausluokkaan II työnantajien vapaaehtoisesti järjestämä sairaanhoito ja muu terveydenhuolto. Vuoden 2002 muutoksella korotettiin työpaikkoihin kohdistuvasta toiminnasta maksettavia korvauksia 60 %:iin, kun muuten korvaus pysyi 50 %:ssa työntekijäkohtaisesta enimmäismäärästä. Enimmäismäärät tarkistetaan vuosittain yleistä kustannuskehitystä vastaavaksi.

Työterveyshuollon sairaanhoito on yleislääkäritasoista. Siihen voi sisältyä fysioterapiaa sekä psykologien ja erikoislääkärien konsultaatioita rajoitetusti riippuen työnantajan sopimuksen laajuudesta. Erikoislääkäri- ja psykologikonsultaatiot ovat korvattavia silloin, kun työterveyslääkäri pyytää työntekijän hoitomahdollisuuksien ja työkyvyn arviointia. Työnantajan saaman korvauksen edellytyksenä on, että palvelut ovat olleet työntekijälle maksuttomia (4,6).

Sekä varsinaisen työterveyshuollon että työterveyshuollon sairaanhoidon piiriin kuuluvien työntekijöiden määrä on

kasvanut. Vuonna 2005 palkansaajia oli 16 % enemmän kuin vuonna 1995 (7). Vuosina 1995–2004 työterveyshuollon henkilöasiakkaiden määrä puolestaan kasvoi 26 % (8). Työterveyshuollon kattavuus pysyi palkansaajien osalta 1990-luvun jälkipuoliskolta 92–93 %:ssa. Sairaanhoitoa työterveyshuollon kautta saaneiden palkansaajien osuus lisääntyi 85 %:sta 93 %:iin vuosina 1997–2006. Kaikista työssäkäyvistä noin 78 % sai sairaanhoitopalveluja työterveyshuollon kautta (9,10).

Vuonna 1991 tehdyssä tutkimuksessa todettiin, että noin puolet työntekijöistä käyttää työterveyshuoltoa sairastuessaan sen sijaan että käyttäisi muita sairaanhoitopalveluja. Osuus vaihteli työterveyshuollon järjestämistavan mukaan (11). Vuonna 2003 kyselytutkimuksen mukaan edellisen vuoden aikana 25–59-vuotiaista työssäkäyvistä työterveyslääkärillä oli käynyt 55 %, terveyskeskuslääkärillä 45 % ja yksityislääkärillä 37 % (12).

Työnantaja voi valita työterveyshuoltopalvelujen järjestämistavan. Sillä voi olla oma työterveyshuolto, se voi ostaa palveluja toisen työnantajan työterveyshuollolta, terveyskeskuksesta, lääkärikeskuksesta tai muulta yksityiseltä palveluntuottajalta tai työnantajat voivat järjestää työterveyshuollon yhteisesti. Palvelujärjestelmä on viime vuosina muuttunut siten, että työnantajien omien työterveysyksiköiden ja niiden työterveyshuoltoon kuuluvien työntekijöiden määrä on vähentynyt (osuus 18 %) ja lääkärikeskusten kasvanut (osuus 39 %) (8).

Terveyskeskusten osalta merkittävä muutos on ollut vuoden 1995 alusta palvelujen hinnoittelun vapautus asetuksen muutoksella, joka on mahdollistanut työterveyspalvelujen kustannusten perimisen työnantajilta (13). Terveyskeskukset ovat kuitenkin olleet varsin maltillisia hintojensa nostamisessa (8). Monet terveyskeskusten työterveysyksiköt ovat muuttaneet taloudellista ja hallinnollista organisointiaan nettobudjettiyksiköiksi ja edelleen liikelaitoksiksi (14).

Vuosina 1994–2000 työterveyshuollon kustannukset työntekijää kohden kasvoivat kaikilla palvelujen tuottajilla ja niiden väliset erot kaventuivat sekä työterveyshuollon toiminnoissa että niistä aiheutuneissa kustannuksissa. Kaikki palveluntuottajat lisäsivät sairaanhoitoa ja muuta ennaltaehkäisevää toimintaa, paitsi työpaikkaselvityksiä (15).

Tämän tutkimuksen tavoitteena on selvittää työterveyshuollon sairaanhoidon osuutta ja muutosta suhteessa muuhun työterveyshuollon toimintaan, palveluntuotantotapoihin ja kustannuskehitykseen vuosien 1996–2005 välillä Kelan työterveyshuoltotilastojen pohjalta.

Aineisto ja menetelmät

Tutkimuksessa analysoitiin Kelan työterveyshuoltotilastoista työterveyshuollon toimintalukujen ja kustannusten muutosta vuosina 1996–2005. Tiedot Kelan tilastoissa perustuvat työnantajien korvaushakemuksiin. Tarkastelun kohteena oli erityisesti työterveyshuollon sairaanhoito. Yrittäjien työterveyshuolto suljettiin pois tästä tarkastelusta.

Ensimmäiseksi vertailuvuodeksi valittiin 1996 korvausjärjestelmän muutoksen vuoksi. Työnantajaa velvoittavasta, ennaltaehkäisevästä toiminnasta (korvausluokka I) on lukumääräistä tilastotietoa terveystarkastuksista tutkimuksineen, työpaikkaselvitystoiminnasta sekä ryhmiin kohdistuvasta tietojen antamisesta ja ohjauksesta. Korvattavat sairaanhoidon (korvausluokka II) kustannukset muodostuvat voimavarakustannuksista ja käynneistä lääkäreillä, hoitajilla, fysioterapeuteilla, erikoislääkäreillä ja muilla asiantuntijoilla (psykologit) sekä laboratorio- ja radiologisista tutkimuksista. Perustamis- ja käyttökustannukset ovat voimavarakustannuksia.

Kelan tilastotiedoissa eri kustannuslajit sisältävät tuloja, jotka tässä ensin vähennettiin kaikista kustannuslajeista tuottajien välisen vertailun parantamiseksi. Tulot muodostuvat pääasiassa työnantajien omien asemien palvelujen myynnistä muille työnantajille ja vakuutusyhtiöiden maksamista korvauksista, esimerkiksi työtapaturmien hoitoon liittyvistä kustannuksista. Kustannukset muutettiin vuoden 2005 rahaksi käyttäen julkisten terveydenhuoltomenojen kustannusindeksiä (1985 = 100). Korvausluokan I mukaisen toiminnan tarkastelussa olivat mukana kaikki työterveyshuollon piiriin kuuluvat työntekijät, kun taas korvausluokan II lukuja tarkasteltiin vain sairaanhoidon piiriin kuuluvien työntekijöiden keskuudessa.

Työterveyshuoltotilastoissa tuottajaryhmät on eritelty vuoteen 2001 saakka työnantajan omiin, työnantajien yhteisiin, toisen työnantajan terveysasemiin, terveyskeskuksiin ja ryhmään muut, joka on sisältänyt lääkärikeskukset, valtion työterveyshuollon ja muut palveluntuottajat. Vuodesta 2002 lähtien lääkärikeskukset ja muut laitokset on tilastoitu omina ryhminään. Muut laitokset sisältävät valtiotyönantajan työterveyshuollon ja muut palveluntuottajat. Valtion työter-

Taulukko I.

Työterveyshuollon piirin kuuluvien työntekijä- ja käyntimäärien sekä tutkimusten määrien muutokset vuosina 1996–2005. Lähde: Kela.

Työntekijä-, hoitokäynti- tai tutkimusmäärä, n	1996	2005	Muutos, %
Työterveyshuollon piiriin kuuluvat työntekijät	1,43 milj.	1,76 milj.	+ 23
Työterveyshuollon sairaanhoidon piiriin kuuluvat työntekijät	1,20 milj.	1,60 milj.	+ 33
Sairaanhoitokäynnit	3,80 milj.	4,80 milj.	+ 26
Terveystarkastuskäynnit	0,91 milj.	0,96 milj.	+ 5
Sairaanhoitokäynnit työntekijää kohti	3,16	2,99	- 5
Terveystarkastuskäynnit työntekijää kohti	0,64	0,55	- 14
Sairaanhoidon laboratoriotutkimukset työntekijää kohti	1,62	2,40	+ 48
Sairaanhoidon radiologiset tutkimukset työntekijää kohti	0,22	0,24	+ 9

veyshuoltoa voivat tuottaa useat eri palveluntuottajaryhmät (16). Tutkimusta varten Kelasta saatiin vuoden 2002 jaottelun mukainen erillinen tilastoajo tuottajaryhmittäistä tarkastelua varten vuosilta 1998–2001. Vuosilta 1996–1997 ei vastaavia tietoja ollut saatavissa.

Tulokset

Vuosien 1996–2005 välillä työterveyshuollon ja työterveyshuollon sairaanhoidon piiriin kuuluvien työntekijöiden määrät kasvoivat selvästi (taulukko 1). Työterveyshuollon piiriin kuuluvilla työntekijöillä työterveyshuollon sairaanhoidon kattavuus kasvoi 84 %:sta 91 %:iin. Sairaanhoidon piiriin kuuluvien palkansaajien osuus terveyskeskuksessa kasvoi tarkasteluaikana 56 %:sta 75 %:iin, kun muilla tuottajilla se oli yli 90 % koko tarkastelujakson ajan.

Sairaanhoitokäyntien ja terveystarkastuskäyntien kokonaismäärät kasvoivat, mutta työntekijää kohti tarkasteltuna molemmat vähenivät (taulukko 1). Tuottajittain suurin vähenemä sairaanhoitokäynneissä vuosina 1998–2005 oli omilla asemilla (13 %) ja suurin kasvu terveyskeskuksissa (29 %).

Työpaikkaselvityksiin käytetty aika lisääntyi yhteensä 71 % ja työntekijää kohti 39 %. Tietojen antamiseen ja ohjaukseen käytetty aika lisääntyi 10 %, mutta työntekijää kohti väheni 11 %, vaikka vaihtelua ajanjakson aikana oli. Työpaikkaselvityksiin käytetty aika työntekijää kohti fysioterapeuteilla lisääntyi 128 %, lääkäreillä 15 % ja terveydenhoitajilla 21 %.

Sairaanhoidon laboratoriotutkimusten määrä työntekijää kohti kasvoi 48 % (1,62:sta 2,4:ään) ja radiologisten tutkimusten määrä 9 % (0,22:sta 0,24:ään). Laboratoriotutkimusten määrä tuottajittain kasvoi eniten terveyskeskuksissa ja ryhmässä muut laitokset vuosien 1998–2005 välillä. Laboratorio- ja radiologisia tutkimuksia lääkärikäyntiä kohti (laskettu mukaan lääkäri- ja erikoislääkärikäynnit) tuottajittain oli eniten terveyskeskuksissa ja vähiten lääkärikeskuksissa vuonna 2005.

Työterveyshuollon kustannukset kasvoivat tasaisesti tarkastelujakson aikana 1996–2005 terveydenhuollon kustannusindeksillä vuoden 2005 rahaksi muutettuna 264 miljoonasta eurosta 426 miljoonaan euroon (61 %). Ehkäisevän toiminnan (korvausluokka I) kustannukset kasvoivat 58 % ja sairaanhoidon (korvausluokka II) 63 %. Työntekijää kohti laskettuna ehkäisevän toiminnan kustannus kasvoi niin ikään tasaisesti. Vuoden 2005 rahaksi muutettuna kasvua oli 29 % eli 72,10 eurosta 92,90 euroon ja sairaanhoidossa 23 % eli 133,80 eurosta 164,30 euroon. Sairaanhoidon kustannusten osuus kokonaiskustannuksista pysyi 60,5– 61,8 %:n välillä koko seurantajakson ajan. Palveluntuottajien kesken tässä oli eroja. Vuonna 2005 osuus oli lääkärikeskuksissa suurin (66 %) ja terveyskeskuksissa pienin (57 %).

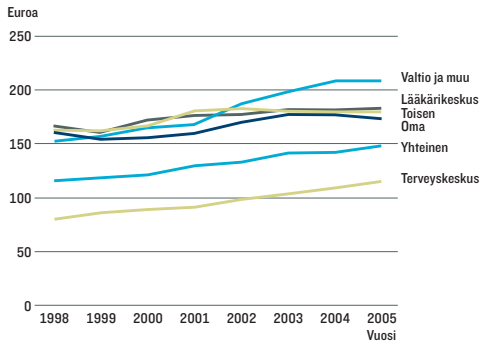
Sairaanhoidon kustannukset kasvoivat tuottajittain samaan tapaan kuin sairaanhoitokäyntien lukumäärä ja sairaanhoidon piiriin kuuluvien työntekijöiden määrä. Työntekijäkohtainen kustannus oli vuonna 2005 pienin terveyskeskuksissa (114,70 euroa). Ryhmässä valtio ja muut laitokset kustannus oli suurin (208,50 euroa) (kuvio 1).

Sairaanhoidon kustannuksista lääkärissäkäyntien osuus oli suurin ja se kasvoi 32 %:sta 40 %:iin. Laboratoriokustannusten osuus oli toiseksi suurin 18 % ja sen osuus kasvoi kahdella prosenttiyksiköllä. Voimavarakustannusten (perustamis- ja käyttökustannukset) osuus väheni ja se oli tarkastelujakson lopussa 14 % (kuvio 2). Niiden osuus vaihteli hyvin paljon tuottajittain. Terveyskeskuksissa, lääkärikeskuksissa ja ryhmässä muut laitokset niiden osuus oli alle 3 %, omilla asemilla noin 20 % ja yhteisillä ja toisen työnantajien asemilla se oli lähes puolet.

Kuvio 1.

Työterveyshuollon sairaanhoidon kustannukset työntekijää kohti tuottajittain vuosina 1998–2005 (euroa vuoden 2005 rahassa, ryhmässä valtio ja muu voi olla useita tuottajia).

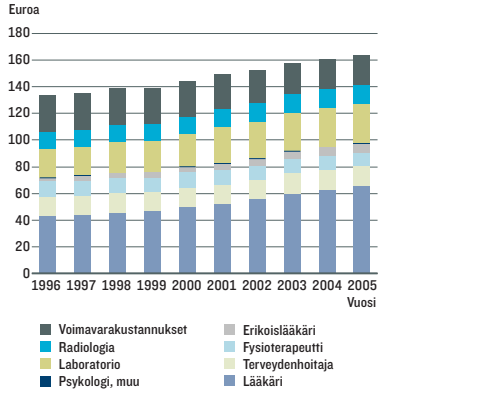
Lähde: Kela.



Kuvio 2.

Työterveyshuollon kustannusten jakaantuminen kustannuslajeittain sairaanhoidon piiriin kuuluvaa työntekijää kohti vuosina 1996–2005 (euroa vuoden 2005 rahassa).

Lähde: Kela.



Lääkärien osuus sairaanhoitokäynneistä kasvoi 49 %:sta 61 %:iin. Erikoislääkärikäyntien (3 %) ja psykologikäyntien (0,3 %) osuus sairaanhoidossa oli hyvin pieni, vaikka niiden määrät työntekijää kohti kasvoivat molemmissa ryhmissä 60 %. Muutoin sairaanhoitokäynnit työntekijää kohti lisääntyivät lääkäreille (18 %), mutta vähenivät terveydenhoitajille (25 %) ja fysioterapeuteille (46 %) (kuvio 3). Tuottajittain tarkasteltuna suurin kasvu käynneissä lääkäreille oli terveyskeskuksissa ja käynneissä erikoislääkäreille terveyskeskuksissa ja yhteisillä asemilla. Lääkäri- ja erikoislääkärikäyntejä oli eniten työntekijää kohti lääkärikeskuksissa ja ryhmässä muut laitokset. Sairaanhoitokäynnit terveydenhoitajille yleisesti vähenivät työntekijää kohti, mutta terveyskeskuksissa selvästi lisääntyivät. Eniten niitä oli omilla ja toisen työnantajan asemilla.

Pohdinta

Työterveyshuollossa tapahtui merkittäviä muutoksia työterveyshuollon sairaanhoidon laajentuessa vuosina 1996–2005.

Kelan työterveyshuoltotilastot pohjautuvat työnantajien tekemiin korvaushakemuksiin. Kaikki pienet työnantajat eivät hae korvausta tai vuosittain ei ole toimintaa, joten tilastot eivät ole täysin kattavia. Työnantajien ilmoittamat työntekijämäärät ovat tilikauden alun ja lopun keskiarvoja. Nämä voivat vaikuttaa siihen, että Kelan tilastojen perusteella työterveyshuollon kattavuus oli pienempi kuin Työ ja terveys -haastattelututkimuksessa (10). Korvausluokkiin jako menee työterveyshuoltojen maksatustietojen perusteella, ja tässä voi olla jonkin verran eroja eri työterveyshuoltojen välillä. Työterveyshuoltotilastojen keskeiset tiedot ovat vertailukelpoisia vuodesta 1979 alkaen. Muutokset toimintojen korvattavuudessa ja Kelan ohjeet niistä voivat vaikuttaa jonkin verran eroihin eri vuosina. Tämän tarkastelun ulkopuolelle jää osa työterveyshuollon toiminnasta ja kustannuksista, joka ei tule Kelan tilastoihin. Nämä epävarmuustekijät heikentävät jonkin verran tutkimuksen luotettavuutta, mutta eivät vaikuta oleellisesti esitettyihin tuloksiin ja kehitystrendeihin. Kustannustietoja voidaan verrata muuhun terveydenhuoltoon, kun ne kytketään terveydenhuollon indeksiin.

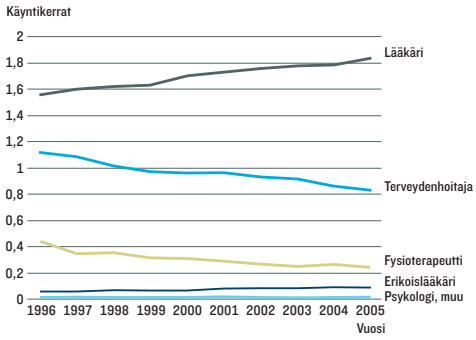
Työterveyshuollon sairaanhoidon kattavuuden laajentuessa sairaanhoitokäynnit kokonaisuudessaan lisääntyivät, mutta työntekijäkohtaisesti vähenivät. Tämä voi selittyä sillä, että toimialoilla, joista työterveyshuollon piiriin on tullut paljon uusia työntekijöitä, kuten rakentamisen, kaupan, kiinteistöhuollon ja kunnallisen sektorin aloilla, ovat sairaanhoitokäyntien määrät työntekijää kohti olleet keskimääräistä pienemmät. Lisäksi sairaanhoitokäynnit terveydenhoitajille ja fysioterapeuteille vähenivät selvästi. Myös omien asemien osalta käynneissä oli selvää vähenemistä. Sairaanhoitokäynnit lääkäreille kuitenkin lisääntyivät työntekijää kohti kaikilla muilla tuottajilla paitsi omilla asemilla. Sairaanhoidon laboratoriotutkimusten ja erikoislääkärikonsultaatioiden määrät työntekijää kohti kasvoivat, mikä johtunee siitä, että sairaanhoitopalveluja tuotetaan useammille. Erityisesti terveyskeskusten osalta laboratoriotutkimusten määrä kasvoi. Muussa työterveyshuollon toiminnassa työpaikkaselvityksiin käytettiin enemmän aikaa myös työntekijäkohtaisesti, mikä on korvausuudistusten tavoitteiden mukaista. Aiemmin vuosina 1994–2000 todettu muutos oli vastakkainen (15).

Palvelutuottajamuutoksia tapahtui siten, että terveyskeskuksiin tuli tarkastelujakson aikana julkisen hallinnon, sosiaali- ja terveydenhuollon ja koulutuksen toimialoilta työterveyshuollon sairaanhoidon piiriin yli 100 000 työntekijää. Tämä näkyi myös kustannusten selvänä kasvuna. Entistä useampi työnantaja osti työterveyshuollon palveluja lääkärikeskuksilta. Tämä voi lisätä työterveyshuollon sairaanhoidon osuutta ainakin lääkärien työssä, koska lääkärien sairaanhoitokäyntien osuus työntekijää kohti on ollut suurinta lääkärikeskuksissa (8).

Kuvio 3.

Sairaanhoitokäynnit työterveyshuollon eri ammattihenkilöillä ja asiantuntijoilla sairaanhoidon piiriin kuuluvaa työntekijää kohti vuosina 1996–2005.

Lähde: Kela.



Tästä asiasta tiedettiin

- Työterveyshuollon sairaanhoidolla on merkittävä osuus suomalaisessa avoterveydenhuollossa.
- Työterveyshuollon työstä suuri osa on sairaanhoitoa.

Tämä tutkimus opetti

- Seuranta-aikana sekä sairaanhoitokäyntien että ennaltaehkäisevän toiminnan määrä lisääntyi.
- Työntekijää kohti tarkasteltuna sairaanhoito ei lisääntynyt, mutta lääkärien osuus sairaanhoidossa kasvoi.
- Työterveyshuollon sairaanhoidon kustannukset pysyivät yleisessä terveydenhuollon kustannuskehityksessä.

Työterveyshuollon kustannusten kasvu (korvausluokka I: 58 % ja korvausluokka II: 63 %) vaikuttaa kohtuulliselta, kun yleisesti avohoidon kustannukset samana tarkasteluaikana 1996–2005 kasvoivat 78 % ja terveydenhuoltomenot kaikkiaan 57 % (17). Työntekijäkohtainen kasvu oli vähäisempää. Työterveyshuollon kustannusten kasvun syitä ovat palvelun käyttäjien ja toimintojen määrän lisääntyminen. Työterveyshuollon kattavuus kasvoi tarkasteluaikana verrattaessa Kelan tilastojen työterveyshuoltoon kuuluvien työntekijämäärätietoja palkansaajiin (7) 80 %:sta 84 %:iin. Sairaanhoidon kustannusten kasvun yhtenä syynä voi olla myös se, että sairaanhoidosta laskutetaan enemmän, kuten terveyskeskuksissa näyttää tapahtuneen. Sairaanhoidon kustannusten jakaantumisessa eri työterveyshuollon henkilöstöryhmien välillä oli merkittävin muutos lääkärien kustannusosuuden lisääntyminen, mikä on seurausta sairaanhoidon käyntimäärien muutoksesta.

Sairaanhoidon osuus työterveyshuollon kokonaiskustannuksista pysyi tarkasteluaikana melko vakaana. Terveyskeskusten työterveyshuollossa sairaanhoidon kustannusten osuus kuitenkin kasvoi, mikä liittynee asetusmuutokseen, jolla kunnalliset työterveysyksiköt saivat oikeuden hinnoitella palvelut tuotantokustannusten mukaan. Terveyskeskusten osalta tulevaisuus tuo lisää muutoksia, jotka koskevat alueellista yhteistyötä ja taloushallinnon muutoksia. Palvelujen hinnoittelussa tuottajien välillä on eroja, mutta sitä ei voi Kelan työterveyshuoltotilastoista suoraan päätellä, vaan se edellyttää esimerkiksi voimavarakustannusten jakamista eri kustannuslajeille. Voimavarakustannusten osuus lääkärikeskuksissa ja terveyskeskuksissa on pieni, koska niitä siirretään palveluista otettaviin hintoihin. Aiemmin tehdyssä selvityksessä terveydenhuollon yksikkökustannuksista ne on todettu terveyskeskuksissa vähäisimmiksi kaikissa muissa ryhmissä paitsi erikoislääkärikäynneissä (18). Voimavarakustannusten lisäksi suoraa vertailua vaikeuttavat työterveyshuoltoyksiköiden saamat tulot, jotka vaihtelevat huomattavasti tuottajittain. Etenkin omilla asemilla on niiden osuus merkittävä ja vaikuttaa työntekijäkohtaisten kustannusten tarkasteluun, joten tässä tutkimuksessa niiden osuus on vähennetty alkuperäisistä luvuista.

Sairaanhoidon osuus kustannuksista pysyi melko samalla tasolla, mutta tuottajien välillä oli eroja. Terveyskeskusten työterveyshuolto näyttää kustannusten ja toimintojen suhteen muuttuvan samaan suuntaan muun työterveyshuollon kanssa. Sairaanhoito on siirtynyt enemmän lääkäreille. Tämän tutkimuksen perusteella ei voi päätellä, onko kehitys tarkoituksenmukaista. Alueellisiakin eroja voi olla.

Sairaanhoidon laajeneminen useampiin yrityksiin voi olla suotavaakin, koska niillä työpaikoilla, joilla sairaanhoitoa oli työterveyshuollon kautta, todettiin olevan myös enemmän ennaltaehkäisevää toimintaa (19). Työterveyshuollossa toteutettava sairaanhoito mahdollistaa myös tiedon saamista työstä ja työolosuhteista ja työhön liittyvät interventiot, joita tutkimuksen mukaan oli 8,8 %:ssa työterveyslääkäreiden vastaanottokäynneistä (20). Sairaanhoidolla on merkittävä osuus työterveyshuollon toiminnassa. Siksi on tärkeää, että se on hyvän työterveyshuoltokäytännön mukaista. Siinä otetaan huomioon ennaltaehkäisevä näkökulma ja työkyvyn ylläpito.

Kymmenen viime vuoden aikana työterveyshuollon toiminta on laajentunut ja sairaanhoidossa lääkärin osuus korostunut. Työnjaon tarkoituksenmukaisuutta tulee tarkastella erikseen. Kustannuskehitys on kohtuullista, kun sitä verrataan muuhun terveydenhuoltoon.

English summary

Illness-related care in occupational health services in Finland: activities and expenses 1996-2005

Background
In Finland, illness-related care in occupational health services (OHS) plays an important role in the field of primary care. This study analysed the changes in illness-related care in the Finnish OHS from 1996 to 2005.
Methods
The study analysed the annual statistics of OHS of the Finnish Social Insurance Institute based on employers' reimbursement applications. The information analysed was the number of visits to occupational health care personnel, and diagnostic tests, and expenses for both in regard to various types of OHS providers.
Results
For employees with employer-arranged occupational health, the coverage of illness-related care in OHS increased to 91%, and the number of visits for illness-related care increased by 26%. Visits per employee decreased by 5%, but visits to physicians increased by 18%. The expense for illness-related care remained between 60.5% and 61.8% of total expense. The expense for OHS increased by 61%, and the overall increase in health care was 57%.
Conclusions
Despite the increase in total number of visits for illness-related care during 1996-2005, the proportion of the total expense for OHS remained at the same level, and the increase in total expense of OHS was similar to the overall increase in health care expense.

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II

Ikonen A, Räsänen K, Manninen P, Rautio M, Husman P, Ojajärvi A, Alha P, Husman K. Use of health services by Finnish employees with impaired health or health risks. The population-based Health 2000 study. Submitted in the International Archives of Occupational and Environmental Health.

Use of health services by Finnish employees with impaired health or health risks: the population-based Health 2000 study

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Abstract

Objectives The aims of this study were to describe the use of occupational health services and other primary health care of Finnish employees, and to examine associations between health problems and risks, and primary care visits to occupational health nurses and physicians and municipal health centre physicians.

Methods A nationally representative sample of 3126 employees aged 30-64 participated in the Health 2000 study, which consisted of a health interview, questionnaires, a clinical health examination, and the Composite International Diagnostic Interview. The use of health services was measured by self-reported visits.

Results During the previous 12 months, 70% of the employees visited occupational health services or municipal health centres, 51% visited only occupational health services. From a third to a half of employees with lifestyle risks, depressive disorders, or other health problems visited occupational health professionals. Obesity, burnout, insomnia, depressive mood, chronic impairing illnesses, and poor work ability were associated with visits to occupational health nurses. Among women, musculoskeletal diseases, chronic impairing illnesses, and poor work ability were associated with visits to occupational health physicians. Lower educational level, smoking, musculoskeletal diseases, chronic impairing illnesses, and poor work ability were associated with visits to health centre physicians.

Conclusions This study showed the importance of occupational health services in the primary health care of Finnish employees. However, a considerable proportion of employees with lifestyle risks, depressive mood, and other health problems did not use health services. Occupational health professionals are in an advantageous position to detect health risks in primary care visits.

Keywords: occupational health services; occupational health physician, occupational health nurse, cross-sectional survey; health care use

Introduction

Musculoskeletal and mental disorders, and hazardous alcohol use are today's major health problems causing disability. Earlier studies provide evidence that a considerable proportion of employees do not consult health services, despite their health problems. Thus, it is a challenge to occupational health services (OHS) to contact employees with risks to work ability.

In two Dutch studies, from one third to 44% of the working population with low back pain sought care (Molano et al 2001, IJzelenberg et al 2004). The study of scaffolders with low back pain showed that 20% of them sought care from OH physicians (Molano et al 2001). In Finnish studies, the proportion of subjects suffering from major depressive disorder (MDD) who used health services for mental problems varied from 28% to 36% (Laukkala et al 2001, Hämäläinen et al 2008). In the Netherlands, of those who reported having psychiatric disorders, 33.9% sought professional care (Bijl et al 2000). Mental problems such as burnout and insomnia have also been shown to predict permanent disability and increase the number of physician visits (Manocchia et al 2001, Sivertsen et al 2006, Ahola et al 2007, Ahola et al 2009).

Seeking treatment for alcohol problems is not frequent. The proportion of those who contacted health care providers has varied from 12% to 17.5% (Bijl et al 2000, Honkonen et al 2007). Lifestyle risk factors such as smoking, obesity, and physical inactivity has been shown to be associated with higher use of health care services (Wetzler et al 1985, Pronk et al 1999, McDowell et al 2006).

In Finland, employees can seek help for their health problems in municipal health centres (HC), in private clinics, or they can consult OHS, if their employers offer them primary care through OHS which is voluntary in addition to mandatory OHS. In 2000, the proportion of employees who were also offered primary care through OHS was over 80%, in 2009 it was over 90% (Piirainen et al 2000, Kauppinen et al 2010). In 2003, 55% of employed people had consulted OH physicians, and

45% HC physicians during the previous year (Virtanen et al 2006). In another study among employed people who had access to employer-arranged primary care, the proportion of all physician visits to OH physicians was 56% among men and 45% among women (Kimanen et al 2010). Employees can also contact OH nurses for primary care. OH nurses may either treat some health problems independently, or they can consult OH physicians. Among employees with access to employer-arranged primary care, the proportion of men who had visited OH nurses during the preceding six months was 44%, and of women 39% (Kimanen et al 2011).

More knowledge is needed regarding how employees with mental disorders, musculoskeletal diseases, and other chronic impairing illnesses or lifestyle risk factors threatening work ability seek primary care, as this would enable early interventions. The aims of this study were to describe the use of OHS and other primary health care services by working Finnish employees, and to examine associations between health problems impairing work ability and health-related risk factors, and primary care visits to OH nurses, OH physicians, and HC physicians.

Methods

Study design

This study is based on a Finnish multidisciplinary epidemiological study, the Health 2000 study, carried out in 2000-2001. The two-stage stratified cluster sample was representative of the Finnish population and comprised 8028 people aged 30 and over. Details and the methodology of the Health 2000 study are published elsewhere (Aromaa and Koskinen 2004, Heistaro 2008). Of the original sample, participation in some stage of data collection was 93%, participation in the interview was 89%, and in the health examination, 80%. Of the total sample, 5871 were of working age (30 to 64

years). Of this base population, 5152 (88%) people were interviewed, 4911 (84%) returned a questionnaire, and 4886 (83%) participated in a comprehensive health examination including a structured mental health interview, which was reliably performed on 4706 subjects. This study focused on working employees aged 30-64 years. Of those, 3126 were currently working part- or full-time (during the last 12 months) and were included in this study.

Measures

Mental and alcohol-use disorders were assessed by a Finnish translation of the German computerized version of the Composite International Diagnostic Interview (CIDI) (Wittchen et al 1998, Heistaro 2008). Trained interviewers conducted interviews to determine 12-month prevalences of mental disorders according to DSM-IV criteria (American Psychiatric Association 1994). In this study, a depressive disorder means having a diagnosis for MDD or dysthymia within the preceding 12 months.

Alcohol-use disorders included a 12-month prevalence of alcohol dependence and alcohol abuse. The participants reported the weekly amount of alcohol consumed by frequency and amount of beer, wine, and spirits. This information was transformed into grams of pure alcohol. In this study the limit for hazardous drinking was 280 g of alcohol weekly for men and 140 g for women, which is based on the Finnish guideline in which the limits for health risks and recommendation to brief intervention are set to 40 g daily for men and 20 g for women (Salaspuro et al 2005). We considered it hazardous health behaviour for alcohol consumption, if the individual had an alcohol-use disorder or hazardous drinking which exceeded the limits.

Other health behaviour and risks were measured by regular smoking, body mass index (BMI, kg/m^2), and reported physical activity. Smoking was considered to be regular if the respondent reported smoking daily. Participants with a body mass index of 30 kg/m^2 or over were classified as

obese. Health-promoting physical activity was considered sufficient if the respondent reported exercising at least four times a week, for at least half an hour at a time.

Burnout was measured using the Maslach Burnout Inventory - General Survey (MBI-GS) (Maslach and Jackson 1981, Maslach et al 1996). To assess the level of burnout, we used a weighted sum score of the three dimensions of burnout: exhaustion, cynicism, and lack of professional efficacy (Kalimo and Toppinen 1997). Burnout and the dimensional scores were categorized into two groups: no burnout (scores 0 to 1.49), and burnout (over 1.50). Burnout meant having monthly or more frequent symptoms.

Sleep problems were elicited by the question “Have you suffered from insomnia?”; response options were yes or no.

The original Beck Depression Inventory (BDI) consisting of 21 items was used to assess depressive symptoms (Beck et al 1961, Beck et al 1988). Their severity was assessed by the sum score so that scores 0-9 were considered to indicate no depression, 10-18 moderate depressive symptoms, and 19-63 severe depressive symptoms. Missing values (seven items at the most) were replaced by the mean of the existing values of the subject, and a sum score was calculated.

Diagnoses of musculoskeletal diseases were based on the trained field physicians' clinical examination which was a standardized GP’s examination. The included diseases were arthritic conditions; chronic neck, low back, and shoulder syndromes; chronic diseases of upper extremities; and sequelae of injuries to the knee and ankle ligaments. The information on chronic impairing illnesses was based on replies to the interview question “Do you have a chronic or long-standing disability, disease, or injury which impairs your work ability or functional capacity?”. All diseases that participants reported as physician-diagnosed and lasting over three months were included.

Information on work ability was collected in the health interview and in questionnaires, including the items of the work ability index (WAI) developed at the Finnish Institute of Occupational Health (Tuomi et al 1997, Tuomi et al 1998). A score of 7-27 was classified as poor, 28-36 as moderate,

37-43 as good, and 44-49 as excellent work ability. We categorized the scores into two classes: poor and moderate as poor, and good and excellent as good work ability.

Health care utilization was measured by numbers of self-reported visits, due to illnesses or symptoms, to OH nurses, OH physicians, and HC physicians during the past 12 months. The utilization was divided into two categories: yes/no. Health check-ups were excluded. Participants were also asked which physician and nurse they primarily contacted when they needed medical help or advice in health-related matters.

Statistical analysis

Weighting adjustment and sampling parameters were used in all of the analyses to take into account the survey design complexities, including clustering in a stratified sample (Aromaa and Koskinen 2004, Heistaro 2008). We used procedures of SAS-callable SUDAAN software version 10.0 for the statistical analyses.

Associations of cross-tabulations were tested using a modified chi square. The relationship with visits to OH nurses, OH physicians, and HC physicians, and explanatory variables were tested by logistic regression models adjusted for age. Calculations were made separately for women and men.

Results

During the previous 12 months, 78% of the whole study population (those whose information was missing were regarded as non-users) had consulted a nurse or a physician in OHS, municipal health centres, or hospital outpatient clinics, 70% had consulted OHS or municipal health centres, and 51% had consulted only OHS. The main contacts for primary care for employees were OH nurses, OH physicians, and HC physicians. An employee could have visited one or more of these health

professionals. Men contacted only OH nurses as often as women, women consulted other health care services significantly more often. Over 40% of the participants preferred to consult primarily OH professionals for their health problems. (Table 1)

Table 2 shows the distribution of characteristics among the study population. Men had significantly more lifestyle health risks than women. Women reported chronic illnesses impairing work ability, depressive symptoms, and depressive disorders more often than men but men considered their work ability to be good more often than women.

Table 3 shows the proportion of employees who visited OH nurses, OH physicians, or HC physicians. Among men, those with a lower level of education and who were smokers visited HC physicians most often. Those who had been diagnosed with a depressive disorder contacted OH nurses the most. Among the men who had other risk factors or illnesses, consulting OH physicians was the most common.

Among women, the proportion of those who visited OH physicians was highest in relation to all other factors except for younger age, lower level of education, and physical inactivity, which related to the highest proportion of employees who consulted HC physicians.

Among men, smokers consulted OH nurses and OH physicians less and HC physicians more than non-smokers. Over half of the women with hazardous alcohol consumption had visited OH physicians during the previous year.

Employees with insomnia or burnout consulted OH nurses, and women consulted OH physicians significantly more often than those without these health problems. Depressive symptoms were related with a higher proportion of men (40%) consulting OH nurses. Among women, those with depressive mood consulted OH nurses significantly more often (about 40%) than those without (31-33%). Almost half of the depressive women, and over 40% of depressive men, had visited OH physicians.

Among both genders, employees with musculoskeletal and chronic illnesses impairing work ability visited OH nurses more than those without these illnesses. Approximately half of the employees with these illnesses consulted OH physicians.

The proportion of employees with a poor WAI who visited OH nurses and OH physicians was significantly higher than that of those with good work ability. Among men, this proportion was also significant regarding visits to HC physicians. Over 50% of those with a poor WAI had visited OH physicians.

Table 4 shows associations between factors and visits to OH nurses, OH physicians, and HC physicians in age-adjusted logistic regression analysis. A lower level of education predicted HC physician consultations. Among men, smoking was associated positively with visits to HC physicians, and inversely with visits to OH nurses and physicians. The associations remained after adjusting for education (data not shown). Obesity and insomnia were associated with visits to OH nurses, among men also burnout, and among women depressive mood. Among men, musculoskeletal diseases, chronic illnesses, and poor WAI were associated with visits to OH nurses and HC physicians. After adjusting for education (data not shown), associations with visits to HC physicians were not significant. Among women, musculoskeletal disorders were associated with visits to OH physicians. Chronic illnesses and poor WAI were associated with visits to both OH nurses and OH physicians.

Discussion

In this study, we found that a half of the study population consulted only OHS for primary care. However, only one third to a half of the employees with studied health problems or health risks had used health care services during the previous twelve months. Associations of insomnia, burnout, depressive disorders, and other chronic impairing illnesses with visits to OH nurses and OH

physicians suggest that the proactive manner is important in detecting and screening health problems and risk factors in primary care consultations.

The finding that 51% of employees had consulted only OHS for primary care during the previous twelve months is in accordance with earlier studies showing that approximately half of employed people visited OH physicians (Virtanen et al 2006, Kimanen et al 2010). The proportion of the employees who visited OH nurses was lower in our study than in the earlier study, which was limited to employees who had access to employer-arranged primary care (Kimanen et al 2011). In the present study, OHS arrangements were not elicited. Furthermore, the age range was different, and the participation rate was higher, which may also explain differences to earlier studies. Important reasons for the high use of OHS in Finland are that employees have rated access and quality of OHS as good (Halonen et al 2006). In addition, OHS is free for employees.

In this study, we did not ask about the reasons for visiting health services. Thus, the results indicate the opportunity to detect possible harmful lifestyle risk factors and illnesses impairing work ability that need health intervention.

Of the lifestyle health risks, obesity predicted visits to OH nurses. Obesity has also earlier been shown to associate with more frequent health care consultations (McDowell et al 2006). In this study, this was shown only in visits to OH nurses. Smoking predicted visits to HC physicians among men but did not associate in other groups and lower education did not explain it. However, smoking has been found to be more frequent among men with lower vocational education. Those men work more often in such industries as construction and small enterprises, which has lower coverage in arranging OHS and primary care through OHS which may partly explain visiting HC physicians in municipal health centres (Piirainen et al 2000).

Physical inactivity did not associate with visits in crude associations; on the contrary, the proportion of physically active employees who visited OHS was higher than those of physically inactive

employees. This may reflect general activity in taking care of one's health. In earlier studies, smoking and physical inactivity associated with more frequent doctor visits (Wetzler et al 1985). For alcohol problems, seeking treatment from primary care (including OHS) has been found to be low (Honkonen et al 2007). In this study, half of the women with hazardous alcohol consumption or alcohol disorders had consulted OH physicians, whereas among men the proportion was one third. Alcohol disorders and hazardous alcohol consumption did not seem to have an effect on the consultation of OH professionals compared with those who did not drink excessively. Thus, hazardous alcohol consumption could be detected in primary care visits to OHS for other reasons. In this study, the limits for hazardous drinking were lower than in earlier Finnish studies, and thus the prevalence of hazardous drinking was higher (Halme et al 2008). We used the limits of the national guidelines as limits for health risks and recommendations for brief intervention, which is also feasible in OHS.

Burnout and insomnia may relate to depressive disorders and disability (Ahola et al 2005, Sivertsen et al 2006, Ahola et al 2009). This study shows that employees suffering from burnout or insomnia visit OH professionals more frequently than those without which presents the opportunity for interventions. The prevalence of burnout among men was as high as among women, implying that screening it might reveal work-related mental ill-being also among men.

Several studies have found seeking treatment for depressive disorders to be insufficient (Bijl et al 2000, Laukkala et al 2001, Honkonen et al 2007, Hämäläinen et al 2008). In this study, we found that over 40% of employees with depressive symptoms or disorders visited OH professionals for some reason. This proportion is higher than that of people who seek treatment for their mental problems (Laukkala et al 2001, Hämäläinen et al 2008). In another Finnish study comprising individuals aged 15-75 years, about 65% of those not using any health services for their major depressive episodes had contacted a doctor for some reason during the past six months (Hämäläinen et al 2004). In a community survey in Canada, 21% of subjects with a psychiatric diagnosis reported

use of mental health services, and 83% of these same subjects used primary care physicians for
ıeral health problems (Parikh et al 1997). In addition, we found that depressive employees visited
I nurses significantly more frequently than those with no depressive symptoms or disorders.
cause disability and retirement due to depressive disorders in Finland is increasing, the coverage
health care contacts should be higher. However, employees with depressive symptoms do not
:essarily feel the need for treatment, or it is possible that the threshold of help-seeking is still
;h. A health survey of a Finnish company revealed that during the six-month follow-up, 57% of
ployees with depressive symptoms measured by the Depression Scale attended a consultation
:h an OH physician even after the invitation. Over 90% of them had visited OHS for some reason
ıimela et al 2007).

the men with physician-diagnosed musculoskeletal diseases, 46% had visited OH physicians,
l of women, 51%. The lower numbers in seeking care from OH physicians in the Netherlands
›bably depends on the differences in health care systems (Molano et al 2001). Chronic illnesses
pairing work ability strongly predicted visiting OH physicians, HC physicians, and private
ysicians in an earlier study, which only included employees who had access to OHS in primary
'e (Kimanen et al 2010). In the present study, all employees were included, and the association
s found with visits to OH nurses and HC physicians among men, and OH nurses and OH
ysicians among women. Among men, none of the symptom, disorder, or disease factors
ociated with visiting OH physicians in crude associations. This may indicate that some other
tors may play a more important role in contacting OH physicians. The employer's requirement
a sickness certificate has been shown to be a significant factor (Kimanen et al 2010).
›rk ability measured by WAI associated strongly with visits to OH professionals and HC
ysicians. In an earlier study WAI predicted disability (Alavinia et al 2009). Therefore work
lity should be considered in primary care visits.

In this study we used data from the Finnish Health 2000 study, which has several strengths. It represents the entire Finnish 30- to 64-year old population and the participation rate was high (80% to 88%). Thus the results can be generalized in these age groups. The questionnaires, the CIDI interviews, and the examination protocols were standardly applied, based on generally accepted recommendations and nationally established practices. The CIDI interview has been found to be a valid method in the assessment of mental disorders (Heistaro 2008). Musculoskeletal diseases were assessed during the physicians' clinical examinations. WAI has been used in several studies and has proved to be a valid measurement in predicting work disability (Ilmarinen et al 1997).

The study did have some limitations however. It was cross-sectional, thus causal relations cannot be assessed. We used self-reports of health care service use, which are vulnerable to recall bias, and may cause some under-reporting of visits (Siemiatycki 1979). Several other factors were self-reported, causing possible inaccuracy. Chronic illnesses impairing work ability and insomnia were assessed by single questions. However, subjective conceptions in these conditions are often considerable.

In conclusion, OHS is the only contact with health care services for half of the employees, emphasizing its role in health interventions for improving employees' work ability. However, a considerable proportion of employees had not contacted health care services during the previous twelve months, although they had harmful lifestyle health risks, symptoms, disorders, or diseases. Thus, other measures such as health check-ups and surveys are needed in OHS to find these employees. This study also shows that OH nurses and OH physicians are in an advantageous position to detect mental problems and other chronic conditions of employees. They should proactively search for health risks during primary care visits, in order to improve employees' work ability.

Conflict of interest The authors declare that they have no conflict of interest.

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Table 1. Proportions of employees who visited health professionals during the previous twelve months and which physicians and nurses they would primarily contact (weighted %)

	Men (*n* = 1480)		Women (*n* = 1646)		p-values[a]
	n	%	*n*	%	
Occupational health physician					
yes	559	38	697	42	<0.001
no	403	27	628	38	
missing	518	35	321	19	
Occupational health nurse					
yes	483	33	541	33	0.36
no	997	67	1103	67	
missing	0	0	2	0.1	
Health centre physician					
yes	416	28	694	42	<0.001
no	544	37	631	39	
missing	520	35	321	19	
Health centre nurse					
yes	138	9	254	15	<0.001
no	1341	91	1390	84	
missing	1	0.1	2	0.1	
Private physician					
yes	227	15	564	35	<0.001
no	735	50	761	46	
missing	518	35	321	19	

Hospital outpatient clinics physician					
yes	237	16	388	23	<0.001
no	725	49	937	57	
missing	518	35	321	19	
Primary physician[b]					
occupational health physician	665	45	707	43	<0.001
health centre physician	296	20	479	29	
private physician	72	5	79	5	
hospital physician	15	1	12	1	
friend/relative physician	31	2	26	2	
no primary physician	391	26	332	20	
Primary nurse[c]					
occupational health nurse	616	42	706	43	<0.001
health centre nurse	38	3	112	7	
private nurse	6	0.4	5	0.3	
hospital nurse	7	0.5	7	0.4	
friend/relative nurse	31	2	32	2	
no primary nurse	770	52	765	46	

[a] p-values for differences between genders

[b] Physician that employees primarily would contact when they needed medical help or advice in health related matters

[c] Nurse that employees primarily would contact when they needed help or advice in health-related matters

Table 2. Distribution of characteristics (weighted %) and information drawn from interviews, questionnaires and clinical examinations in study population

	Men (*n* = 1480) *n* (weighted %)	Women (*n* = 1646) *n* (weighted %)	p-values for difference between genders
Age			
30-44	780 (52)	826 (48)	0.031
45-54	540 (37)	622 (39)	
55-64	358 (11)	198 (13)	
Education			
basic	321 (22)	352 (22)	<0.001
secondary	664 (45)	523 (32)	
higher	495 (33)	771 (47)	
Smoking			
yes	450 (31)	358 (22)	<0.001
no	1030 (69)	1288 (78)	
Physical activity			
yes	391 (27)	592 (36)	<0.001
no	1061 (73)	1036 (63)	
Body mass index (kg/m^2)			
over 30	258 (18)	300 (19)	0.548
under 30	1205 (82)	1337 (81)	
Hazardous alcohol consumption			
yes	237 (18)	132 (9)	<0.001

no	1114 (82)	1400 (91)	
Burnout			
yes	381 (27)	437 (28)	0.530
no	1015 (73)	1117 (72)	
Insomnia			
yes	306 (24)	365 (24)	0.631
no	1000 (76)	1165 (76)	
Depressive symptoms			
no	1222 (86)	1217 (76)	<0.001
moderate	151 (11)	282 (18)	
severe	41 (3)	93 (6)	
Depressive disorder			
yes	55 (4)	130 (8)	<0.001
no	1319 (96)	1409 (92)	
Musculoskeletal disease			
yes	419 (30)	475 (31)	0.759
no	985 (70)	1106 (69)	
Chronic impairing illness			
yes	475 (32)	620 (38)	0.001
no	1004 (67)	1025 (62)	
Work ability index			
poor	236 (17)	314 (20)	0.023
good	1161 (83)	1257 (80)	

Table3. Proportions of employees (Weighted percentages and standard errors [SE]) who visited occupational health (OH) nurses, OH physicians, and health centre (HC) physicians during previous twelve months (an employee could have visited one or more health professionals)

	Men *(n* = 1480)			Women *(n* = 1646)		
Factor	OH nurse	OH physician	HC physician	OH nurse	OH physician	HC physician
	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)
Total	32.71	37.82	28.05	33.01	42.44	41.92
	(1.34)	(1.55)	(1.29)	(1.31)	(1.40)	(1.26)
Age						
30-44	30.20	35.27	28.40	30.95	41.08 (	46.22
	(1.63)	(1.84)	(1.59)	(1.62)	8(1.72)	(1.78)
45-54	36.46	39.36	26. 59	34.09	41.62	39.59
	(2.09)**	(2.18)	(2.10)	(32.17)	(2.26)	(2.05) **
55-64	32.14	45.02	31.37	37.47	50.09	32.84
	(3.85)	(4.18)	(3.61)	(3.66)	(3.56) **	(3.37) ***
Education						
basic	30.38	31.01	36.12	34.35	40.68	43.20
	(2.45)	(2.01)***	(2.93)***	(2.78)	(2.91)	(2.71)
secondary	33.19	39.38	28.63	34.33	41.96	46.43
	(2.03)	(2.38)	(1.74) *	(2.05)	(2.39)	(2.28) *
higher	33.60	40.17	22.01	31.48	43.60	38.27
	(2.17)	(2.33)	(1.95)	(1.81)	(1.84)	(1.87)
Smoking						
yes	28.03	31.03	35.48	30.46	43.61	42.13

	(2.11)*	(2.38)***	(2.29)***	(2.68)	(2.75)	(2.69)
no	34.77	40.81	24.79	33.71	42.12	41.87
	(1.64)	(1.86)	(1.40)	(1.41)	(1.61)	(1.41)
Physical activity						
no	31.63	37.54	28.42	31.48	42.35	43.76
	(1.53)	(1.73)*	(1.51)	(1.50)*	(1.75)	(1.60)
yes	35.22	39.48	26.99	35.99	42.89	38.99
	(2.54)	(2.54)	(2.41)	(2.00)	(2.08)	(1.99)
Body mass index (kg/m^2)						
over 30	43.39	45.06	34.57	40.02	45.45	45.45
	(3.30) ***	(3.42)	(2.92)	(3.01)*	(3.07)	(2.65)
under 30	30.21	36.37	26.70	31.63	41.82	41.11
	(1.37)	(1.70)	(1.40)	(1.42)	(1.49)	(1.38)
Hazardous alcohol consumption						
yes	31.43	39.12	29.41	33.18	51.59	34.16
	(3.00)	(3.16)	(3.10)	(4.12)	(4.24)	(3.90)*
no	33.36	39.52	27.10	33.75	42.35	42.70
	(1.59)	(1.74)	(1.34)	(1.45)	(1.43)	(1.39)
Burnout						
yes	38.30	42.72	30.36	37.42	48.87	43.73
	(2.57)**	(2.73)	(2.32)	(2.27) *	(2.45)*	(2.48)

no	30.75	37.16(1.68)	26.75	31.75	40.87	41.17
	(1.52)		(1.51)	(1.60)	(1.62)	(1.45)
Insomnia						
yes	40.07	42.44	31.35	39.57	49.41	43.56
	(2.88)**	(2.95)	(2.77)	(2.50)**	(2.83)*	(2.84)
no	30.63	37.65	26.99	31.85	40.70	42.00
	(1.47)	(1.74)	(1.38)	(1.47)	(1.54)	(1.43)
Depressive symptoms						
yes	39.65	41.49	33.32	40.16	49.44	46.44
	(3.54)*	(3.81)	(3.54)	(2.45)**	(2.74)	(2.66)
no	31.26	37.98	27.09	31.34	40.93	40.57
	(1.43)	(1.65)	(1.33)	(1.51)	(1.44)	(1.40)
Depressive disorder						
yes	45.33	43.49	36.72	42.37	49.31	45.22(4.09)
	(7.24)	(6.64)	(6.14)	(4.21)*	(4.49)	
no	32.39	38.97	27.49	32.81	42.58	41.74
	(1.39)	(1.61)	(1.35)	(1.46)	(1.43)	(1.39)
Musculoskeletal disease						
yes	38.56	46.27	35.87	37.40	51.23	44.59
	(2.19)*	(2.48)	(2.23)*	(2.21)*	(2.38)**	(2.40)
no	29.68	35.41	24.81	31.57	39.21	40.76
	(1.67)	(1.71)	(1.42)	(1.56)	(1.57)	(1.51)

Chronic impairing illness						
yes	43.73 (2.22)***	48.28 (2.40)	36.60 (2.28)	39.08 (2.01)***	52.88 (2.20)***	47.62 (2.11)
no	27.42 (1.43)	32.90 (1.65)	24.03 (1.37)	29.32 (1.46)	36.09 (1.63)	38.37 (1.48)
Work ability index						
poor	49.89 (3.89)***	56.48 (3.36)*	42.78 (3.16)*	44.39 (2.75)***	57.69 (3.23)**	49.28 (2.95)
good	28.79 (1.41)	35.18 (1.55)	25.24 (1.33)	30.70 (1.50)	39.31 (1.54)	40.56 (1.36)

*p<0.05 **p<0.01 ***p<0.001 between the groups within the factor in each column

Table 4. Odds ratios (ORs) and their 95% confidence intervals (CIs) of visits to occupational health (OH) nurses, OH physicians, and health centre (HC) physicians (an employee could have visited one or all health professionals) in logistic regression analysis adjusted for age.

	Men (*n* = 1480)			Women (*n* = 1646)		
	OH nurse OR (95% CI)	OH physician OR (95% CI)	HC physician OR (95% CI)	OH nurse OR (95% CI)	OH physician OR (95% CI)	HC physician OR (95% CI)
Education						
basic	0.78 (0.57-1.07)	0.41 (0.29-0.60)	2.36 (1.65-3.37)	1.04 (0.75-1.43)	0.76 (0.55-1.03)	1.58 (1.17-2.14)
secondary	0.99 (0.77-1.28)	0.83 (0.61-1.15)	1.37 (1.02-1.83)	1.12 (0.89-1.41)	0.85 (0.66-1.08)	1.46 (1.12-1.91)
higher	1.00	1.00	1.00	1.00	1.00	1.00
Smoking						
yes	0.74 (0.58-0.94)	0.52 (0.39-0.70)	1.85 (1.41-2.43)	0.87 (0.67-1.14)	1.11 (0.83-1.48)	1.00 (0.75-1.32)
no	1.00	1.00	1.00	1.00	1.00	1.00
Physical activity						
no	0.86 (0.67-1.11)	0.75 (0.56-1.01)	0.97 (0.71-1.32)	0.83 (0.69-1.01)	0.95 (0.75-1.19)	1.17 (0.93-1.48)

yes	1.00	1.00	1.00	1.00	1.00	1.00
BMI						
over 30	1.72 (1.30-2.28)	1.27 (0.89-1.82)	1.37 (0.97-1.93)	1.39 (1.05-1.84)	1.05 (0.78-1.40)	1.24 (0.96-1.60)
under 30	1.00	1.00	1.00	1.00	1.00	1.00
Hazardous alcohol consumption						
yes	0.92 (0.68-1.26)	0.91 (0.65-1.29)	1.08 (0.76-1.54)	0.98 (0.67-1.44)	1.44 (0.97-2.13)	0.58 (0.39-0.87)
no	1.00	1.00	1.00	1.00	1.00	1.00
Burnout						
yes	1.38 (1.08-1.75)	1.09 (0.81-1.46)	1.07 (0.81-1.41)	1.25 (0.99-1.58)	1.24 (0.98-1.56)	1.07 (0.84-1.36)
no	1.00	1.00	1.00	1.00	1.00	1.00
Insomnia						
yes	1.45 (1.13-1.87)	1.00 (0.72-1.39)	1.12 (0.84-1.51)	1.36 (1.08-1.71)	1.26 (0.96-1.66)	1.06 (0.79-1.41)
no	1.00	1.00	1.00	1.00	1.00	1.00
Depressive symptoms						

severe	1.39 (0.76-2.55)	0.82 (0.40-1.65)	1.26 (0.64-2.45)	1.88 (1.24-2.86)	1.40 (0.90-2.19)	1.03 (0.65-1.65)
moderate	1.41 (0.99-2.02)	0.89 (0.56-1.42)	1.14 (0.74-1.76)	1.31 (1.00-1.71)	1.08 (0.83-1.40)	1.13 (0.86-1.49)
no	1.00	1.00	1.00	1.00	1.00	1.00
Depressive disorder						
yes	1.75 (0.99-3.08)	0.88 (0.45-1.71)	1.25 (0.69-2.27)	1.51 (1.05-2.19)	1.21 (0.83-1.76)	1.02 (0.68-1.52)
no	1.00	1.00	1.00	1.00	1.00	1.00
Musculoskeletal disease						
yes	1.45 (1.16-1.83)	1.11 (0.86-1.44)	1.36 (1.03-1.78)	1.25 (0.99-1.57)	1.37 (1.08-1.74)	1.06 (0.82-1.37)
no	1.00	1.00	1.00	1.00	1.00	1.00
Chronic impairing illness						
yes	2.00 (1.61-2.49)	1.19 (0.92-1.53)	1.29 (1.01-1.64)	1.50 (1.23-1.82)	1.49 (1.19-1.87)	1.16 (0.93-1.44)
no	1.00	1.00	1.00	1.00	1.00	1.00

Work ability index						
poor	2.40 (1.80-3.20)	1.29 (0.93-1.78)	1.48 (1.07-2.04)	1.72 (1.33-2.23)	1.65 (1.22-2.22)	1.27 (0.96-1.68)
good	1.00	1.00	1.00	1.00	1.00	1.00

III

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Factors associated with visits to occupational health physicians in Finland

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Background	In Finland, employers can offer primary care to employees in addition to obligatory occupational health services (OHS).
Aims	To analyse factors associated with visits to seek primary care from occupational health physicians (OH physicians) and compared with visits to physicians in municipal health centres, private clinics and hospital outpatient clinics.
Methods	The subjects of this population-based cross-sectional survey comprised 1753 randomly selected employed Finns aged 25–64 years covered by OHS including primary care. The associations between visits to physicians during the past 6 months and factors related to work and perceived health were tested using Poisson regression analysis.
Results	Provision of primary care in OHS increased visits to OH physicians but decreased visits to municipal health centre physicians. Among both genders, long-standing illnesses impairing work ability had the strongest associations with visits to all physicians. Among men, the factors associated with visits to OH physicians were long-standing illnesses without effect on work ability, requirement of sickness certificate from the first day of sickness, OHS arranged in private clinics and moderate stress symptoms. Among women, lower vocational level, OHS arranged in private clinics or joint-model OHS units, moderate stress symptoms and workplace harassment were associated with visits to OH physicians.
Conclusions	Primary care in OHS enables OH physicians to reach workers with work-related health problems, thus enabling interventions on working conditions and work ability. Moreover, OHS seem to be a very important health care provider in Finland.
Key words	Cross-sectional survey; occupational health physicians; occupational health services; office visits; work-related factors.

Introduction

Occupational health services (OHS) in Finland are an essential part of health care for working people. Based on the Occupational Health Care Act of 1978, employers are obliged to offer preventive occupational health care to all employees. In addition, employers can arrange primary care and other health care services for employees.

Employers may arrange OHS in a variety of ways. They can have an employer-owned OHS unit, a joint OHS unit with other employers, or they can buy services from another employer with its own OHS unit, from OHS units in municipal health centres or from private OHS clinics. In recent years, the trend has moved towards less employer-owned OHS units, with employers more often purchasing services from other providers, mainly from private OHS clinics [1].

Based on 1963 legislation, employers are partly reimbursed for the costs of organizing OHS by the Social Insurance Institution. By law, visits to occupational health physicians (OH physicians), occupational health nurses (OH nurses) or other OHS experts are free of charge for employees. In public municipal health centres and in public hospital outpatient clinics, physicians' clients are required to pay a moderate fee for treatment (11–15 and 22 euros, respectively, July 2008). In Finland, when employed people have health problems, they can choose whether to consult physicians in municipal health centres, private physicians or OH physicians. Hospital outpatient clinics require a referral, except in cases of emergencies. Therefore, OHS form an important part

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of primary care for the employed population of Finland [2]. In recent studies, approximately half of working-aged people reported having consulted an OH physician for primary care advice during the previous year [3]. In 2005, of all physician visits in OHS, 92% were for primary care advice and 8% for health check-ups [4].

Studies on work-related factors and their associations with health service use, especially OHS use, are scarce. In Finnish studies of physician utilization, factors such as age, female gender, provision of OHS, size of workplace, perceived harmful factors at work, work-related symptoms, chronic illnesses restricting work and need of sickness certificate from the first day of sick leave were associated with visits to OH physicians more often than those to other physicians [2,5]. A Dutch study on visiting OH physicians or GPs showed associations between health problems, physical work demands, mental health problems, chronic conditions and visits to OH physicians [6]. Demographic variables, health problems and psychosocial work environment as predictors of sickness absence have been found to be similar among those who have visited either an OH physician or a GP [7].

The aim of this study was to examine the factors associated with visits to OH physicians to seek primary care advice among employed people in Finland. These associations were then compared to visits to physicians in municipal health centres, private clinics and outpatient hospital clinics.

Methods

We used the data of the Work and Health Survey 2006 conducted by the Finnish Institute of Occupational Health [8]. The sample comprised Finnish-speaking persons aged 25–64 years, randomly selected from the Population Information System maintained by the Finnish Population Register Centre who consented to a computer-assisted telephone interview carried out between January and May 2006. The study population was representative of the Finnish working-age population in terms of age and gender [8].

Within this group, we identified working subjects who had access to primary care services through their OHS. In the analysis of all physician visits, we included all respondents in order to gain an overview of the distribution of physician visits, also among working-aged people not at work (unemployed, retired, students, housewives, etc.) and working people for whom OHS did not cover primary care.

Our study was a cross-sectional survey comprising a variety of questions related to the subjects' perceived health, work ability, health behaviour, sickness absenteeism, working conditions, life situation outside work and OHS. The content and the questions in the survey were planned by a multidisciplinary expert group of the Finnish Institute of Occupational Health and had already been applied in three earlier surveys. More detailed information about the design of the survey and the baseline characteristics has been published earlier [8,9]. The Ethics Committee of the Finnish Institute of Occupational Health has approved the Work and Health Survey.

The demographic and socio-economic variables were age, vocational education, income and job contingency.

Variables concerning subjects' health were the presence of a long-standing illness affecting current work and stress symptoms. Variables concerning OHS were OHS provider, access to OH nurses and access to OH physicians.

We included such work-related variables as size of organization (measured by the number of employees) and the requirement of sickness certificate from the first day of sick leave to test earlier findings [6]. Psychosocial work-related variables were the ability to influence matters concerning one's work and workplace harassment.

As an outcome variable measuring the use of health care services, we used the numbers of visits due to illnesses and maternity care to physicians in different health care units over the previous 6 months. Periodical health check-ups were excluded. We analysed relations between explanatory variables and visits to OH physicians, municipal health centre physicians, private physicians and hospital outpatient clinic physicians. In the analysis of the total number of physician visits, we also included visits to any other physicians not mentioned above.

The statistical analyses were performed separately for men and women. Because of the scarcity of evidence of factors related to OHS use, we first tested crude associations with several variables and visits to health care by Pearson correlations and cross-tabulations. For further analyses, we included significant variables in chi-square tests ($P < 0.05$). We used Poisson regression analysis because of the skewed distribution of visits and the large proportion of subjects with no visits. First, we calculated univariate Poisson regression analysis with odds ratios (ORs) and their 95% confidence intervals (95% CI). Then, we chose the most significant variables from the univariate to the multivariate Poisson regression analysis. All the analyses were carried out using the statistical package SAS version 9.1.3.

Results

Of the 4971 selected subjects, 13% refused to participate, 8% were unobtainable and 16% had an unknown telephone number, leaving 3122 persons (63%) who completed a computer-assisted telephone interview. Demographic data are shown in Table 1. Within the study group, there were 1753 working subjects (865 men and 888 women) who had access to primary care services through their OHS. In this group, the numbers

Table 1. Measures of variables, classification for statistical analysis and descriptive characteristics of study population by gender

Variable	Categories for the statistical analysis	Men (n = 865), n (%)	Women (n = 888), n (%)	P values for difference between groups
Age (years)	25–34	177 (20)	150 (17)	
	35–44	237 (27)	255 (29)	
	45–54	278 (32)	310 (35)	
	55–64	172 (20)	174 (19)	
Occupational education	No education/ vocational course	172 (20)	175 (20)	***<0.001
	Vocational school	318 (37)	223 (25)	
	Vocational institute	164 (19)	255 (29)	
	University	211 (24)	235 (26)	
Income (euros/month)	1–1999	172 (23)	424 (51)	***<0.001
	2000–2999	329 (44)	295 (36)	
	>3000	253 (34)	112 (13)	
Job contingency	Permanent	711 (92)	731 (85)	***<0.001
	Contingent	65 (8)	128 (15)	
Long-standing illness[a]	Yes, affects work	124 (14)	121 (14)	
	No effect on work	216 (25)	230 (26)	
	No long-standing illness	523 (61)	536 (60)	
Stress symptoms[b]	Much	76 (9)	91 (10)	
	To some extent	223 (26)	257 (29)	
	Only a little	254 (29)	271 (31)	
	Not at all	310 (36)	269 (30)	
Provision of OHS	Joint model	60 (7)	36 (4)	***<0.001
	Private OHS clinics	375 (44)	297 (34)	
	Employer owned	165 (19)	168 (19)	
	Municipal health centre	251 (29)	374 (42)	
Access to occupational health nurse	Poor	116 (15)	153 (20)	*<0.05
	Good	354 (46)	333 (44)	
	Very good	298 (39)	277 (36)	
Access to occupational health physician	Poor	211 (27)	255 (33)	
	Good	330 (43)	312 (40)	
	Very good	227 (30)	211 (27)	
Size of organization by number of employees	>250	475 (55)	581 (67)	***<0.001
	50–249	146 (17)	141 (16)	
	10–49	118 (14)	90 (10)	
	1–9	121 (14)	53 (6)	
Sickness certificate needed from the first day	Yes	263 (39)	197 (25)	***<0.001
	No	416 (61)	604 (75)	
Influence on work[c]	Bad	125 (14)	146 (16)	***<0.001
	Moderate	280 (32)	356 (40)	
	Good	460 (53)	386 (44)	
Workplace harassment[d]	Yes	61 (7)	127 (14)	***<0.001
	No	771 (92)	752 (86)	

Questions in the survey:

[a]Do you have a diagnosed long-standing illness of at least 3 month duration? Does this/these long-standing illness(es) affects your current work?

[b]Stress means the situation when a person feels tense, restless, nervous or anxious or is unable to sleep at night because his mind is troubled all the time. Do you feel that kind of stress these days?

[c]At work, can you influence matters concerning you?

[d]Harassment at work is constant or repeated teasing, bullying or insulting behaviour. Have you in the past or are you now experiencing this kind of harassment at work?

of employees and entrepreneurs were 1636 and 117, respectively.

Table 2 shows means and standard deviations of visits to physicians in health care, including OH physicians, municipal health centre physicians, private physicians and hospital outpatient clinic physicians. Both genders visited OH physicians more often than other physicians. Men and women made an equal number of visits to OH physicians, but women more often to other physicians. There was no difference by gender in the proportion of those having visited OH physicians as opposed to health centre physicians, private physicians and hospital outpatient clinic physicians. The proportion of visits to OH physicians was 56% among men and 45% among women.

Table 3 shows the numbers of visits to non-OH physicians according to OHS arrangements. Working people not covered by OHS had the smallest number of visits to physicians. People not working had the largest number of visits to non-OH physicians. Respondents covered by OHS providing primary care visited OH physicians more often but visited other physicians less often than the other groups.

Table 4 shows associations between factors included in the multivariate Poisson regression analysis and visits to OH physicians, health centre physicians and private physicians. Age and income were not associated with visits to OH physicians. Younger women visited health centre and private physicians more frequently than older women. Lower income was associated with visits to health centre physicians among women and inversely associated with visits to private physicians among men. A lower vocational education level was associated with visits to health centre physicians among men and OH physicians among women. Long-standing illness affecting work ability was the variable with the strongest association with visits to all physicians. It was the only variable that was associated with visits to hospital outpatient clinic physicians (data not shown). Among men, long-standing illnesses that did not affect work ability were associated with visits to OH physicians: among women, this was to private physicians. Among men, moderate psychological stress was associated with visits only to OH physicians, but severe stress was not associated with visits to any physicians. For women, stress was associated with visits to OH physicians, health centre physicians and private physicians. We did not ask about the work relatedness of stress, but 76% of women and 77% of men reported that their working conditions affected their mental symptoms (depressive mood, irritability, tension, fatigue, sleeplessness and lack of concentration) significantly or to some extent.

OHS arranged in joint-model OHS units and private OHS clinics was associated with more visits to OH physicians. Inadequate access to OH physicians was associated with visits to health centre physicians and private physicians only among women. Access to OH nurses or size of organization was not associated with visits to physicians. The need for a sickness certificate from the first day of sick leave was associated with increased visits to OH physicians (36%) among men but not among women.

Table 2. Visits to physicians (mean, SD) excluding health checks in previous 6 months among subjects (employees and entrepreneurs)

	Men (n = 865)		Women (n = 888)	
	Number of visits, mean (SD)	Men who made visits, 864 (%)	Number of visits, mean (SD)	Women who made visits, 886 (%)
OH physician	0.9 (1.43)	373 (43)	0.9 (1.46)	409 (46)
Health centre physician	0.3 (0.80)	149 (17)	0.4 (0.99)	218 (25)
Private physician	0.2 (0.89)	102 (12)	0.4 (1.00)	245 (28)
Hospital outpatient clinic physician	0.2 (0.87)	99 (11)	0.3 (0.76)	138 (16)

SD, standard deviation.

Table 3. Visits to physicians (mean, SD) excluding health checks among all study subjects according to OHS arrangements

	OH physician, mean (SD)	Health centre physician, mean (SD)	Private physician, mean (SD)	Hospital outpatient clinic physician, mean (SD)	Other physician, mean (SD)	All visits, mean (SD)
People not working (n = 893)	0.2 (0.71)	1.1 (1.71)	0.4 (1.04)	0.5 (1.33)	0.2 (0.81)	2.3 (3.06)
OHS arrangement						
Not covered by OHS (n = 335)	0.04 (0.25)	0.8 (1.68)	0.4 (1.05)	0.2 (0.66)	0.03 (0.18)	1.4 (2.42)
Covered by OHS, no primary care (n = 141)	0.4 (2.03)	0.7 (1.37)	0.5 (1.17)	0.3 (0.75)	0.1 (0.80)	2.0 (3.19)
Covered by OHS with primary care (n = 1753)	0.9 (1.44)	0.4 (0.90)	0.3 (0.95)	0.2 (0.82)	0.06 (0.33)	1.9 (2.48)

SD, standard deviation.

Table 4. Adjusted relative risk (OR) and their 95% CI of visits to health care in Poisson regression multivariate analysis adjusted for age, income, size of organization, access to OH nurses and influence on work

	OH physician		Health centre physician		Private physician	
	Men, OR (95% CI)	Women, OR (95% CI)	Men, OR (95% CI)	Women, OR (95% CI)	Men, OR (95% CI)	Women, OR (95% CI)
Occupational education						
No education/ vocational course	0.87 (0.59–1.29)	1.52 (1.09–2.12)	3.09 (1.34–7.13)	1.17 (0.67–1.96)	0.87 (0.40–1.85)	0.83 (0.49–1.40)
Vocational school	1.22 (0.88–1.68)	1.45 (1.05–2.01)	2.96 (1.40–6.28)	1.21 (0.75–2.12)	0.80 (0.41–1.56)	0.96 (0.61–1.52)
Vocational institute	0.91 (0.64–1.30)	1.27 (0.94–1.72)	1.79 (0.78–4.09)	0.83 (0.51–1.67)	0.36 (0.16–0.80)	0.75 (0.49–1.14)
University	1.0	1.0	1.0	1.0	1.0	1.0
Long-standing illness						
Yes, affects work	2.13 (1.61–2.82)	2.29 (1.80–2.92)	2.46 (1.43–4.23)	1.74 (1.14–3.13)	2.43 (1.35–4.40)	1.48 (0.97–2.26)
No effect on work	1.37 (1.06–1.79)	1.24 (0.98–1.57)	1.58 (0.95–2.61)	1.29 (0.89–2.43)	1.04 (0.59–1.84)	1.48 (1.05–2.09)
No long-standing illness	1.0	1.0	1.0	1.0	1.0	1.0
Stress symptoms						
Rather much, much	1.04 (0.67–1.63)	1.22 (0.88–1.69)	1.55 (0.72–3.32)	2.25 (1.26–3.51)	1.23 (0.53–2.82)	1.63 (0.93–2.87)
To some extent	1.54 (1.16–2.04)	1.37 (1.07–1.77)	0.95 (0.53–1.68)	1.94 (1.22–3.37)	1.12 (0.61–2.07)	1.88 (1.20–2.93)
Only a little	1.19 (0.89–1.74)	0.96 (0.73–1.26)	1.00 (0.59–1.70)	2.22 (1.41–4.11)	0.99 (0.54–1.79)	1.66 (1.06–2.60)
Not at all	1.0	1.0	1.0	1.0	1.0	1.0
Provision of OHS						
Joint model	1.14 (0.71–1.84)	1.83 (1.24–2.71)	0.70 (0.28–1.77)	0.61 (0.27–1.31)	0.73 (0.25–2.12)	0.39 (0.12–1.24)
Private OHS clinics	1.64 (1.19–2.27)	1.34 (1.05–1.70)	0.89 (0.52–1.54)	0.67 (0.45–1.57)	0.87 (0.47–1.60)	1.01 (0.69–1.47)
Employer owned	1.20 (0.81–1.77)	1.09 (0.82–1.45)	1.00 (0.53–1.89)	0.67 (0.43–1.54)	1.58 (0.78–3.20)	0.90 (0.60–1.36)
Municipal health centre	1.0	1.0	1.0	1.0	1.0	1.0
Access to OH physician						
Poor	0.77 (0.51–1.16)	0.71 (0.51–0.99)	1.25 (0.59–2.65)	1.78 (1.02–2.76)	0.77 (0.31–1.92)	1.98 (1.14–3.42)
Good	1.00 (0.70–1.44)	0.79 (0.60–1.05)	1.15 (0.57–2.34)	1.23 (0.72–2.05)	1.27 (0.58–2.80)	1.43 (0.86–2.37)
Very good	1.0	1.0	1.0	1.0	1.0	1.0
Sickness certificate needed from the first day						
Yes	1.36 (1.06–1.74)	1.00 (0.80–1.24)	0.91 (0.57–1.48)	1.31 (0.92–2.51)	0.75 (0.42–1.34)	0.99 (0.68–1.43)
No	1.0	1.0	1.0	1.0	1.0	1.0
Workplace harassment						
Yes, now or in the past	1.32 (0.90–1.93)	1.34 (1.05–1.71)	0.56 (0.22–1.44)	1.19 (0.79–2.20)	0.93 (0.36–2.40)	1.51 (1.04–2.19)
Never	1.0	1.0	1.0	1.0	1.0	1.0

In the crude Poisson procedure (data not shown), workplace harassment was associated with visits to OH physicians among men in the univariate analysis (OR 1.50, 95% CI 1.04–2.15), but the association disappeared in the multivariate analysis. Among women, it was associated with visits to OH physicians and private physicians also in the multivariate analysis. Influence on one's own work did not associate with visits to physicians.

Discussion

In this study, individuals visited OH physicians more frequently for primary care issues than other physicians. As expected, individuals with long-standing illnesses impairing work ability had the strongest association with the use of health care. Stress symptoms among women showed a positive association with visits to physicians, but among men only with visits to OH physicians. To our knowledge, this is a new finding. We also found that workplace harassment showed a positive association with visits to OH physicians.

The strength of this study is that it is population based and representative of Finnish working people. Thus, the results can be generalized to the Finnish working population covered by OHS offering primary care in the age range of 25–64 years. Subjects from Southern Finland are slightly under-represented [8], which may have an effect on the results, as OHS are even more important health care providers in Southern Finland than elsewhere [3]. A weakness is that the study is cross-sectional and that causal relations cannot be assessed. The number of visits was elicited retrospectively and not verified from registers, which may cause some under-reporting of visits [10]. However, as the study

concentrated on a 6 month period, recall bias is not likely to be considerable. Psychosocial factors were investigated by single questions and no standardized methods were used, which may reduce validity to some extent. However, the questions concerning psychosocial factors were simple; thus, we can assume that potential misunderstandings are scarce.

OHS as a part of primary care is a very important means of health care provision for working people in Finland, as shown previously [3,5,11]. In this study, visits to OH physicians during the previous 6 months were similar in men and women, but women made more visits to all other physicians. Working people not covered by OHS made fewer visits to physicians. The majority of this group was entrepreneurs and farmers [8], who have reported long-standing illnesses affecting work ability and health risks considerably [9], and this finding suggests that these groups of workers underuse health care facilities.

Age and gender were associated with the use of OHS in earlier studies [2,5], but this finding was not present in our study. Women of fertile age made more visits to health centre physicians, which may partly be due to the number of visits for maternity care, mainly provided by municipal health centres in Finland [12]. About one-third of women's visits to private physicians are due to visits to gynaecologists [13].

Among women, a lower vocational educational level was associated with visits to OH physicians. This may reflect true need as lower vocational educational level is associated with poorer perceived health [9,14]. Among men, a lower vocational educational level was associated with visits to health centre physicians, which may reflect OHS arrangements with limited primary care offered by employers. In addition, it may reflect the use of out-of-hours services for primary care provided mainly by municipal health centres.

Long-standing illnesses impairing work ability were associated most with visits to health care among both men and women, but men seemed to also use OHS for other long-standing illnesses.

Moderate psychological stress was related to visits to OH physicians in both genders. In the original survey, managers and specialist professionals most often reported severe stress but made fewer visits to health care services than average [8]. Among women, stress was associated with increased visits to all physicians.

Good accessibility has previously been associated with the use of employer-owned OHS [15]. In our study, visits to OH physicians were associated with OHS arranged in private OHS clinics or joint-model OHS units. This may result from better resources and better access [1]. The association of visits and OHS in private OHS clinics has been shown earlier [5]. In previous studies, employees considered access to OH physicians easier than to municipal health centre physicians and have rated the quality of services of OH physicians as being high [16]. In addition, the use of OHS is free for employees. Thus, the threshold for using OHS may be lower than other health care services, especially for men. Poor access to OH physicians seemed to increase the use of other health care among women, but similar compensation was not detected among men.

Employers requiring sickness certificates from the first day of sickness are usually in the private sector. In this study, a larger share of men had employers in the private sector [8], which may partly explain their increased use of OHS. This association between requirement for certifying sickness and visiting OH physicians was also shown in an earlier study [5].

Workplace harassment was associated with visits to OH physicians and private physicians among women. This is in accordance with an earlier finding that women are more likely to seek overall health services in relation to workplace harassment [17]. Crude associations would indicate that men, too, may consult an OH physician in the case of workplace harassment. Workplace harassment and work stress have been found to be associated with sickness absence [18,19] and depressive symptoms [20–23]. Thus, recognizing them in OHS is important.

Primary care in occupational health care differs from that of other primary care as it is better able to take into account the relation of work and the work environment to the present illness [24]. Although in Finland, today, primary care in OHS may at times be overemphasized and may consume resources from preventive tasks; it fulfils the important function of recognizing work-related health problems. In other countries, primary care in OHS might require additional education for OH physicians.

Overall, in Finland, OHS have a key role for working people in primary care, and the use of OHS reduces the use of public health centres. Men, especially, are inclined to visit OH physicians for health concerns.

Key points

- Occupational health services are an important provider of primary health care in Finland.
- Men and women made an equal number of visits to occupational health physicians, but women visited other physicians more often.
- Visits for primary care advice in occupational health services was associated with reduced use of other primary health care facilities.

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Conflict of interest

None declared.

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IV

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ORIGINAL ARTICLE

Primary care visits to occupational health physicians and nurses in Finland

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Abstract

Aims: In Finland, 91% of employer-arranged occupational health services (OHS) include primary care for employees. Occupational health (OH) physicians and OH nurses carry the main responsibility for primary care in OHS. This study analyses work- and health-related factors associated with primary care visits to OH physicians and OH nurses. *Methods:* This population-based cross-sectional survey encompassed 1636 randomly selected working employees aged 25–64 covered by OHS which included primary care. The associations between factors and visits during the previous 6 months were tested by Poisson regression analysis. *Results:* The proportion of employees who visited OH physicians or OH nurses was 57%. Men visited OH nurses more often than women, but the number of visits to OH physicians was similar. Long-standing illnesses impairing work ability, work-related symptoms, and type of OHS provision were associated with visits to both OH physicians and nurses. Moderate psychological stress was associated with visits to OH physicians. Among men, the requirement of obtaining a sick-leave certificate on the first day of absence was associated with visits. Less possibilities to influence one's work was associated with visits to OH nurses, and among women also to OH physicians. Poor support from supervisors and co-workers had non-significant or inverse associations. ***Conclusions:*** **The wide use of OHS and both the type and similarities between factors associated with visits may signify that both OH physicians and OH nurses are likely to encounter work-related health problems through primary care in OHS.**

Key Words: *Occupational health nursing, occupational health physicians, occupational health services, office visits*

Background

The tasks of occupational health services (OHS) and the division of work between OHS personnel vary among European Union countries. For example, primary care, in addition to preventive measures, is common in Finland and Italy. In some countries supplementary provision of primary care can be agreed upon with client enterprises [1]. The difference between primary care in OHS and other primary health care is the possibility of OHS to have an influence in workplaces in terms of supporting work ability and improving working conditions on the basis of information received through primary care [2]. Studies on the health- and work-related factors which are associated with visiting occupational health (OH) nurses and OH physicians for primary care are rare. Therefore knowledge regarding how OHS reach employees with health risk factors through primary care and how OHS arrangements affect this is very limited.

In Finnish studies on physician utilisation, factors which are associated with visiting OH physicians have been found to include work-related symptoms, chronic illnesses, workplace hazards, older age, female gender, OHS provided through employer-owned OHS units, working in a large organisation, proving one's sickness, commuting, moderate stress symptoms, and workplace harassment [3–5]. Dutch studies have shown that health problems and physical work demands are associated with visiting OH physicians, and that fatigue-related visits to OH physicians are more common than those to general

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practitioners (GP) [6,7]. In a Norwegian study, subjective health complaints and sick leave during the previous year were associated with contacting OH practitioners [8]. In addition, mental and musculoskeletal diseases are most often regarded as being possibly related to work by employees visiting OH physicians [9].

In Finland, employers may have an OHS unit in their facilities or a joint OHS unit with other employers, or they can purchase services from OHS units in municipal health centres or private clinics. In 2006, 92% of employees were covered by OHS, of which 91% were covered by primary care [10]. In 2006, employed people reported that 44% of all visits to physicians were to OH physicians [11]. Finnish OH physicians partly act as GPs for employees and also offer preventive aid. OH nurse's work in primary care in OHS may include primary prevention, emergency care, treatment services, and planning [12–14]. In Finland, the education of a public health nurse (including a nursing degree) before specialising as an OH nurse provides the basis for administering primary care. OH nurses consider primary care skills important, and, in turn, information from workplaces received through primary care enables more comprehensive care [15].

In Finnish OHS, OH nurses and OH physicians bear the main responsibility for treatment in addition to their preventive work such as health check-ups and workplace visits. The division of labour between OH physicians and OH nurses is such that OH nurses may take care of simple acute diseases, certify short sick leaves, and provide guidance for chronic illnesses. Other OH personnel (physiotherapists, psychologists) play a minor role in primary care. The health problems that can be treated in OHS are not circumscribed, but presenting work-related health problems is emphasised [16]. OH nurses, as the largest single group of OH personnel, are at the front line in helping to protect and promote the health of working populations [12]. In 2005, 69% of office visits to OH nurses and 92% to OH physicians were for primary care advice [17]. In 1989, the most common reasons for visits to OH nurses for primary care were fever, elevated blood pressure, cough, back problems, and throat symptoms. OH nurses referred 25–35% of their patients to physicians, mainly OH physicians [18]. In practice, it is not usually required to see an OH nurse before getting an appointment to an OH physician, but OH nurses can affect the patient flow to OH physicians significantly, also by telephone contact. Access to OH nurses is usually easier, as most work full-time and there is a shortage of OH physicians, particularly in the OHS units of municipal health centres. OH nurses have almost twice as many resources as OH physicians [19]. Musculoskeletal, respiratory, and cardiovascular problems have been the most common reasons for visits to OH physicians [9,18]. Work-related interventions have been considered by patients beneficial in one-third of all cases [9].

The aims of this study were to describe how Finnish employees use different types of OHS for primary care, as well as to examine the associations between health- and work-related factors and visits to OH physicians and OH nurses for primary care. The role of OH nurses is examined separately from that of OH physicians in order to clarify their respective roles in primary care. Another objective was to gain further knowledge regarding how OHS reach employees with impaired health or work-related health risks.

Methods

The study's data are based on the Work and Health Survey 2006 conducted by the Finnish Institute of Occupational Health [11]. A random sample was drawn from the Population Information System maintained by the Finnish Population Register Centre. The sample consisted of 4791 Finnish-speaking people aged 25–64. Of the sample, 63% (3122 subjects) participated in a computer-assisted telephone interview carried out by trained interviewers, 16% had an unknown telephone number, 13% refused to participate, and 8% were unreachable. The study population was representative of the Finnish working-age population, except that respondents from southern Finland were slightly underrepresented compared to the general population. Participants were categorised as working if currently employed full- or part-time, were on sick leave for under 6 months, or were working over 15 hours a week while studying. The proportion of working participants was 71% ($n = 2229$), which is slightly more than in the whole population aged 15–64 years (68%) [11]. We included working employees with employer-arranged OHS and those having the option of primary care through their OHS ($n = 1636$, 777 men and 859 women). The study population corresponded to the general distribution of employees in Finnish workplaces, except that the proportion of agricultural workers was smaller. The number of employees from the municipal sector was slightly higher and from the private sector lower than in the general working population. Thirty-one per cent of the participants were labourers, 36% were lower-level white-collar employees, and 31% were higher-level white-collar employees.

The content and questions in this cross-sectional survey were planned by a multidisciplinary expert group at the Finnish Institute of Occupational Health. Similar surveys have been carried out earlier, in 1997, 2000, and 2003. The questions (over 200) dealt with perceived health, work ability, health behaviour, sickness absenteeism, working conditions, life situation, OHS, and the use of health care. Detailed information from the survey design and the baseline characteristics has been published earlier [10,11]. The Work and Health Survey has been approved by the Ethics Committee of the Finnish Institute of Occupational Health.

We chose several explanatory variables which we assumed would associate with visits to OHS. To test the earlier findings, we chose such variables as OHS provision (joint-model, private OHS clinics, employer-owned, OHS units of municipal health centres) and the subject's need to obtain a sick-leave certificate on the first day of absence (yes/no) [4].

Health variables included the presence of a long-standing illness (of at least 3 months' duration) having a detrimental effect on current work, perceived psychological stress, perceived work-related symptoms, and perceived health compared to people of the same age. Stress symptoms were elicited by responding to the following statement: "Stress means a situation in which a person feels tense, restless, nervous, anxious, or is unable to sleep at night because his mind is troubled all the time. Have you felt this kind of stress recently?" (severe/moderate/good) [20]. Work-related symptoms were elicited by responding to the following question: "During the last 6 months have you suffered from physical or mental symptoms either for a long period of time or repeatedly, that you think are caused or worsened by work?" (yes/no).

Work-related psychosocial variables included possibilities to have an influence on one's own work and workload, and support of supervisors and co-workers. The former were examined using the questions "At work, can you influence matters which concern you?" [20] and "Can you influence your workload?" Support at work was investigated by asking "Do you get support and help from your supervisor?" [20] and "Do you get support from your co-workers, if you need it?" These were categorised as poorly, moderately, and very much.

The outcome variable used was the number of visits due to illnesses and maternal care to OH nurses and OH physicians during the 6 months previous to the study. The reasons for visits were not inquired about. All illness-related visits were included. In Finland, maternal care is mainly provided in municipal health centres by GPs and maternal care nurses, rarely in OHS. Periodical health check-ups were excluded.

We performed statistical analyses for men and women separately. Cross-tabulations were tested by a chi squared test. We included potential explanatory variables in a univariate Poisson regression analysis. Due to the missing data on the variables concerning support from supervisors and co-workers, we excluded self-employed subjects and entrepreneurs from the multivariate analysis and from the study in general. Rate ratios and 95% confidence intervals for each explanatory variable were estimated by multivariate Poisson regression models adjusted for age and all other variables in the model. Poisson regression multivariate analysis was used because of the skewed distribution of visits and large proportion of non-visiting subjects. The outcome variables were Poisson distributed. The averages and standard deviations of the numbers of visits were calculated by standard statistical procedures, and the differences between averages of OH nurse and OH physician visits were tested by one sample's Student's *t*-test. The analyses were carried out using the SAS statistical package, version 9.1.3.

Results

Table I shows the characteristics of the study population. Some differences can be seen between genders. Among men, private OHS clinics were the main OHS provider, and among women, municipal health centres. Men needed a sick-leave certificate on the first day of absence more often than women. Women reported more stress and work-related symptoms than men.

Overall, 57% of employees visited either OH nurses or OH physicians during the 6-month period. The proportion of women who visited OH physicians was higher than of those who visited OH nurses (Table II). The proportion of men and women who visited OH physicians was higher than that of those who visited OH nurses in the OHS units of private clinics. According to the OHS provider, the proportion of men (54%) and women (57%) who visited OH physicians was highest in private OHS clinics. The proportion of men and women who visited OH nurses and OH physicians was lowest in municipal health centres. No significant difference was found between men and women in the proportions of employees who visited OH nurses or physicians in different OHS units.

The total number of men's visits to OH nurses and OH physicians over the 6-month period was higher (average 1.98), but did not differ significantly

Table I. Characteristics of the study population and classification of the variables for statistical analysis by gender.

Variable	Categories for statistical analysis	Men ($n=777$)	Women ($n=859$)	Chi squared	df	p-value
Age				4.95	3	0.18
	25–34	168 (22)	149 (17)			
	35–44	213 (27)	249 (29)			
	45–54	247 (32)	294 (34)			
	55–64	149 (19)	167 (19)			
Provision of occupational health services				54.29	3	<0.001
	Joint-model	56 (7)	36 (4)			
	Private OHS clinics	350 (46)	287 (34)			
	Employer-owned	164 (21)	167 (20)			
	Municipal health centre	194 (25)	356 (42)			
Sick-leave certificate needed on the first day				34.3	1	<0.001
	Yes	263 (39)	197 (25)			
	No	416 (61)	604 (75)			
Possibilities to influence work				8.73	2	0.01
	Poor	124 (16)	146 (17)			
	Moderate	274 (35)	355 (41)			
	Good	379 (49)	358 (42)			
Possibilities to influence workload				34.33	2	<0.001
	Poor	269 (35)	405 (47)			
	Moderate	290 (37)	297 (35)			
	Good	218 (28)	155 (18)			
Support from co-workers				1.9	2	0.39
	Poor	43 (6)	61 (7)			
	Moderate	158 (20)	164 (19)			
	Good	571 (74)	628 (74)			
Support from supervisors				0.39	2	0.82
	Poor	112 (15)	124 (15)			
	Moderate	215 (28)	253 (30)			
	Good	434 (57)	476 (56)			
Long-standing illness				0.13	2	0.94
	Yes, harmful to work	102 (13)	118 (14)			
	No harm on work	204 (26)	225 (26)			
	No long-standing illness	470 (61)	515 (60)			
Perceived health compared to those of same age				5.94	2	0.05
	Poor	249 (32)	237 (28)			
	Fairly good	384 (50)	437 (51)			
	Good	135 (18)	182 (21)			
Psychological stress				6.79	2	0.03
	Much	63 (8)	88 (10)			
	To some extent	198 (26)	254 (30)			
	Very little	514 (66)	517 (60)			
Work-related symptoms				10.16	1	0.001
	Yes	190 (25)	272 (32)			
	No	583 (75)	586 (68)			

Values are n (%).

($t=1.16$, df 1634, $p=0.25$) from that of women (average 1.81). Table III shows the other numbers of visits to OHS providers. Altogether, women visited OH physicians more often than OH nurses, and in private OHS clinics in particular. The number of men's visits to OH nurses was higher than that of women ($t=2.06$, df 1634, $p=0.04$), but the number of visits to OH physicians did not differ ($t=0.56$, df, 1634, $p=0.6$). Men visited OH nurses more often than women in all other types of OHS except municipal health centres, where women made more visits to OH nurses ($t=3.78$, dg 1634, $p=<0.001$) and OH physicians ($t=3.89$, df 1634, $p=<0.001$) than men.

Table IV shows the associations between factors and visits to OH nurses and OH physicians in the multivariate Poisson regression analysis. Employees whose OHS were arranged by municipal health centres made fewer visits to both OH nurses and OH physicians than those whose OHS were arranged by other providers. Among men, the employer's requirement of employees obtaining a sick-leave

Table II. Proportion of employees (men = 777, women = 859) who made primary care visits (1 or more, yes/no) to OH nurses and OH physicians excluding health check-ups in previous 6 months according to OHS provision.

		Visits to OH nurse		Visits to OH physician	
OHS provision	Response	Men	Women	Men	Women
Joint-model	Visited	28 (50)	16 (44)	23 (41)	16 (44)
	Not visited	28 (50)	20 (56)	33 (59)	20 (56)
Private OHS clinics	Visited	159 (46)	111 (39)	188 (54)	165 (57)
	Not visited	190 (54)	176 (61)	162 (46)	122 (43)
Employer-owned	Visited	92 (56)	77 (46)	74 (45)	77 (46)
	Not visited	72 (44)	89 (54)	90 (55)	89 (54)
Municipal health centre	Visited	58 (30)	128 (36)	65 (34)	137 (38)
	Not visited	136 (70)	227 (64)	129 (66)	219 (62)
Total	Visited	337 (44)	332 (39)	350 (46)	395 (47)
	Not visited	426 (56)	512 (61)	414 (54)	450 (53)
Missing		14	15	13	14

Values are *n* (%).
OH, occupational health; OHS, occupational health services.

Table III. Primary care visits to OH nurses and OH physicians (averages within 6 months) excluding health check-ups among employees (men = 777, women = 859) according to OHS provision.

	Visits to OH nurse		Visits to OH physician	
OHS provision[a]	Men	Women	Men	Women
Joint-model	1.36	1.17	0.86	1.44
Private OHS clinics	1.11	0.78	1.17	1.16[a]
Employer-owned	1.49	1.13	0.93[a]	0.90
Municipal health centre	0.50	0.73	0.54	0.78
All	1.05	0.84	0.93	0.97[b]

[a]For number of employees by OHS provision and gender, see Table I.
p-values for differences between numbers of visits to OH nurses and physicians among men and women.
[a]$p < 0.001$; [b]$p < 0.05$.
OH, occupational health; OHS, occupational health services.

certificate on the first day of absence was associated with visits to both OH nurses and OH physicians.

Of work-related psychosocial factors, a lack of influence on one's own work was associated with visits to OH nurses, but to OH physicians only among women. Poor support from co-workers was associated with fewer visits to OH nurses and among men also to OH physicians. Poor support from supervisors also had inverse associations with visits to OH physicians among women.

Variables concerning health, long-standing illnesses impairing work ability, and work-related symptoms in both genders were associated with visits to both OH nurses and OH physicians. Altogether, 73% of women and 65% of men who reported work-related symptoms had visited either an OH nurse or physician. Of women who reported long-standing illnesses impairing work ability, 84% had visited one or another OH professional, and of men 67% (data not shown). Among both genders, moderate psychological stress, but not severe stress, increased visits to OH physicians.

The subjects also assessed access to OHS (data not shown): a total of 79% rated access to OH nurses and 76% to OH physicians as either excellent or good in private clinics. Municipal health centres had the lowest proportions at 64% and 50%, respectively.

Discussion

Men and women made a similar number of visits to OH physicians, but women visited OH physicians more than OH nurses for primary care advice. The type of OHS provision, long-standing illnesses impairing work ability, and work-related symptoms were most strongly associated with visiting OH nurses and OH physicians. Stress was only associated

Table IV. Adjusted rate ratios and their 95% confidence intervals of primary care visits to OH nurse and OH physician by gender in multivariate Poisson regression analysis adjusted for age and all other variables in the model.

	Visits to OH nurse		Visits to OH physician	
	Men ($n=777$)	Women ($n=859$)	Men ($n=777$)	Women ($n=859$)
Provision of occupational health services				
Joint-model	2.42 (1.75–3.35)	1.67 (1.17–2.37)	1.26 (0.87–1.83)	2.03 (1.48–2.79)
Private OHS clinics	1.90 (1.50–2.41)	1.15 (0.95–1.39)	1.81 (1.43–2.28)	1.68 (1.41–1.99)
Employer-owned	1.96 (1.51–2.54)	1.44 (1.18–1.76)	1.26 (0.95–1.65)	1.21 (0.98–1.50)
Municipal health centre	1.0	1.0	1.0	1.0
Sickness certificate needed from first day				
Yes	1.59 (1.36–1.87)	1.14 (0.96–1.36)	1.32 (1.11–1.57)	0.98 (0.83–1.16)
No	1.0	1.0	1.0	1.0
Possibilities to influence work				
Poor	1.33 (1.04–1.70)	1.55 (1.22–1.97)	1.14 (0.88–1.48)	1.31 (1.04–1.64)
Moderate	1.48 (1.23–1.78)	1.17 (0.97–1.42)	1.18 (0.97–1.43)	1.13 (0.95–1.36)
Good	1.0	1.0	1.0	1.0
Possibilities to influence workload				
Poor	0.95 (0.75–1.20)	0.82 (0.64–1.04)	1.03 (0.81–1.30)	0.95 (0.76–1.20)
Moderate	1.06 (0.86– 1.31)	0.85 (0.67–1.08)	1.01 (0.82–1.26)	1.06 (0.84–1.34)
Good	1.0	1.0	1.0	1.0
Support from co-workers				
Poor	0.59 (0.40–0.85)	0.65 (0.45–0.95)	0.57 (0.38–0.86)	0.89 (0.66–1.19)
Moderate	0.77 (0.63–0.95)	1.00 (0.83–1.22)	0.92 (0.74–1.14)	0.86 (0.71–1.05)
Good	1.0	1.0	1.0	1.0
Support from supervisors				
Poor	1.21 (0.96–1.52)	0.77 (0.59–1.00)	1.15 (0.90–1.46)	0.78 (0.61–0.98)
Moderate	1.03 (0.85–1.25)	1.15 (0.95–1.38)	0.75 (0.60–0.92)	0.72 (0.60–0.87)
Good	1.0	1.0	1.0	1.0
Long-standing illness				
Yes, harmful to work	2.44 (1.99–2.99)	1.37 (1.09–1.72)	2.03 (1.63–2.53)	2.12 (1.74–2.58)
No harm on work	1.66 (1.38–1.99)	1.12 (0.92–1.35)	1.38 (1.14–1.68)	1.32 (1.10–1.59)
No long-standing illness	1.0	1.0	1.0	1.0
Perceived health				
Poor	0.92 (0.73–1.16)	1.87 (1.42–2.45)	1.21 (0.93–1.58)	1.92 (1.47–2.49)
Quite good	0.78 (0.62–0.97)	1.40 (1.09–1.79)	1.14 (0.88–1.46)	1.36 (1.07–1.74)
Very good	1.0	1.0	1.0	1.0
Psychological stress				
Severe	1.02 (0.77–1.34)	1.13 (0.87–1.47)	0.91 (0.67–1.24)	1.21 (0.96–1.54)
Moderate	1.00 (0.84–1.20)	1.01 (0.84–1.20)	1.33 (1.10–1.59)	1.33 (1.13–1.57)
No	1.0	1.0	1.0	1.0
Work-related symptoms				
Yes	1.33 (1.12–1.58)	1.21 (1.02–1.44)	1.40 (1.17–1.68)	1.48 (1.26–1.74)
No	1.0	1.0	1.0	1.0

OH, occupational health; OHS, occupational health services.

with visits to OH physicians. Of work-related psychosocial factors, a lack of influence on one's work was associated with visiting OH nurses, but poor support from co-workers and supervisors had inverse associations with visits to OHS.

The study showed that 57% of Finnish employees covered by primary care in OHS visited either OH physicians or OH nurses due to illnesses in one 6-month period, and that Finnish men visited OH physicians similarly to women but made more visits than women to OH nurses. Maternal care had no significant impact on women's numbers of visits, because this is arranged mostly through municipal maternal care. The results of the Health 2000 study showed that women aged 30–64 made significantly more visits to OH physicians [21]. However, that study was of a general working-age population whereas ours was limited to employees receiving primary care in OHS.

The type of OHS provision was associated with visiting OHS, which is in accordance with previous studies. [3,4]. An earlier study has shown numbers of visits being highest in OHS models other than employer-owned or municipal OHS [4]. This study revealed the same trend, as private clinics were included in the other OHS models of the same earlier study. This may be due to the accessibility of these types of OHS, as they have better resources and are

more accessible compared to the OHS units of municipal health centres [19]. Thus the frequency of visits and proportion of employees using OHS are higher in types of OHS other than OHS units in municipal health centres. Differences in the efficiency of various OHS providers were not examined. Good accessibility was a factor associated with using OHS also in an earlier study [22].

Among men, the requirement of obtaining a sick-leave certificate on the first day of absence was associated with visits to both OH nurses and OH physicians; the latter association was also found in earlier studies [4], which implies that practices have remained similar.

Long-standing illnesses impairing work ability and work-related symptoms were strongly associated with visits to OH nurses and OH physicians. In addition, the proportions of employees suffering from work-related symptoms or long-standing illnesses who visited OHS were high. This implies that in primary care visits, OH nurses and physicians may acquire information regarding working conditions and the work ability of employees that would enable them to intervene, provided that they are appropriately notified. An earlier study had shown an association between work-related symptoms and visits to OH physicians [4]. In our study, psychological stress symptoms were not associated with visits to OH nurses. Our finding that only moderate stress symptoms were associated with visits to OH physicians and severe symptoms were not is surprising. Attitudes may prevent employees from seeking help for these problems from OHS. In a study of the Norwegian Police Force, GPs were contacted more than OH practitioners, and this was assumed to be due to availability, mistrust, and concern about anonymity [8]. However in Finland, patient satisfaction with OH physician services has been good and contacting OH physicians is more common than contacting GPs [5,23].

It appears that work-related psychosocial factors such as low social support at work are related to psychiatric morbidity [24,25] and sickness absence [26]. Reduced social support from supervisor was associated with increased use of health care [27]. We hypothesised that poor support from supervisors and co-workers would increase visits to OH nurses and OH physicians. Our results showed the opposite: poor support at work had inverse associations with visits. A possible explanation is that this factor in itself does not cause enough symptoms to prompt one to seek help. Having a weak influence on one's work was associated with visits to OH nurses, and among women, to OH physicians. In this study, less possibilities to influence one's work seemed to be a more relevant factor in visits to OHS than the poor support from supervisors and co-workers.

The study has certain limitations. It was cross-sectional and causal relations could not be assessed. It was also based on telephone interviews and recall bias was possible regarding the numbers of visits in particular. Still, as the period of time concerned was only the recent 6 months, the bias is likely to be small. In addition, psychosocial factors were elicited by single questions and not by standardised methods, which may weaken the value of the results and interpretations. However, the questions were simple and clear, so risks of misunderstandings are unlikely.

Conclusions

Primary care visits to Finnish OHS seem to be common. The proportion of employees who visited OH physicians was highest in the OHS units of private clinics. The factors associated with visits to OH physicians and OH nurses were quite similar in OHS primary care. The explanation for this may be that during treatment, the OH nurse may be the first contact. As well, the nurse may either treat some health problems independently or consult OH physicians, and after the patient had visited an OH physician, the OH nurses might take care of any follow-up. Psychological stress should receive more attention in OHS, so that unrecognised needs could be detected. Long-standing illnesses impairing work ability and work-related symptoms were the factors most strongly associated with visits to both OH nurses and OH physicians. Thus in health systems such as Finland's, OHS have a good opportunity to gain knowledge about employees' work ability and working conditions through primary care, which complements information from general check-ups and workplace surveys.

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Conflicts of interest

None.

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Work-Related Primary Care in Occupational Health Physician's Practice

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Abstract *Introduction* Primary care is frequently integrated in Finnish occupational health services (OHS). This study examines the frequency of work-related health problems in occupational health (OH) physicians' consultations for primary care and associations between health problems and interventions carried out by OH physicians. *Methods* OH physicians assessed the health problems of 651 consecutive visits in a private OHS unit. The health problem was regarded as work-related if it was caused or aggravated by work, or involved impaired work ability. Interventions carried out by OH physicians were analysed by logistic regression analysis. *Results* The main health problem was caused either partially or mainly by work or symptoms were worsened by work (27%), or symptoms impaired work ability (52%). Musculoskeletal and mental disorders were the main work-related reasons for visits. In two-thirds of the cases of mental health problems, work caused or worsened symptoms, and the majority of long sickness absences were issued due to these problems. OH physicians carried out interventions concerning work or workplace in 21% of visits. Mental disorders were associated most strongly (OR 7.23, 95% CI 3.93–13.32) with interventions. The strongest association (OR 16.09, 95% CI 9.29–27.87) with work-related visits was, when the health problem was both work-induced and impaired work ability. *Conclusions* Work-related health problems comprise a considerable part of Finnish OH physicians' work. OH physicians play an important role in early treatment, in the prevention of disability, and in interventions aimed at workplaces based on the knowledge they get through primary care in OHS.

Keywords Occupational health services · Office visits · Intervention · Counselling · Work ability · Occupational health physician

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Introduction

Preventing work-related health problems and the work disability of employees are the main tasks of occupational health services (OHS). Work-related illnesses can be caused, aggravated, or accelerated by work, or they can impair work ability according to the definition of the WHO expert committee [1]. In the European Union, 8.6% of workers had experienced work-related health problems in the past 12 months in 2007 [2]. There is little knowledge of the amount of work-related health problems of employees

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n the occupational health (OH) physicians' consultations or primary care, or of the interventions focusing on individuals or workplaces based on consultations. This study aims to examine OH physicians' practices in Finland.

The proportion of work-related consultations in primary care varies according to health systems and health problems. Work-related health problems are treated by general practitioners (GP), OH physicians, and clinical specialists [3–8]. In Finland, OH physicians act partly as GPs for employees, and they also treat health problems other than work-related conditions in OHS [9]. Another role of OH physicians is to improve working conditions in collaboration with workplaces. Primary care in OHS is not common in other countries. In some countries supplementary provision of primary care can be agreed upon with client enterprises [10]. In the US, mainly large companies have had interest in integrating primary care with existing OHS [11, 12].

Finnish employees visit OH physicians more frequently than other physicians for primary care [13]. The proportions of reasons for primary care visits to OH physicians in two Finnish studies vary: musculoskeletal disorders in 33–39% of cases, respiratory disorders 17%, cardiovascular disorders from 8 to 11%, dermatological disorders from 4 to 9%, and mental disorders in 2–7% of cases [14, 15]. OH physicians assessed the reason for consultations as being work-related in 13% of consultations and possibly work-related in 21% [15]. They assessed mental disorders as work-related and possibly work-related in 26 and 32% of cases respectively, and musculoskeletal disorders in 22 and 34% of cases, respectively.

In other countries, musculoskeletal disorders, mental ill health, skin problems, and acute injuries are most frequently reported as work-related [3–6]. In the UK in 1996–2001, musculoskeletal disorders and mental illnesses were illnesses which were most reported by occupational physicians as work-related [16]. In France musculoskeletal disorders represented 65% and mental disorders 24% of notified work-related diseases by OH physicians in a surveillance program of compulsory medical consultations [17]. In the US, those OH physicians whose most work is in the area of treatment see mainly patients with musculoskeletal disorders [18]. In the analysis of activities of Japanese OH physicians, 9.5% of working hours are allocated for mental health care [19]. Dutch OH physicians use almost the half of their working hours for guidance of workers on sick leave [19].

Impaired work ability and sickness absence predict future disability [20–22]. Musculoskeletal and mental disorders are both major health problems causing sickness absence and disability [23, 24]. The proportion of work-related disability is not indicated in the statistics of disability pensions. In the UK, according to GP reporting mental ill health was responsible for most work-related sickness absence [3]. Of Dutch employees on sick leave, 34% reported that their work-related health problem resulted in sickness absence exceeding 1 month [25]. In a Finnish study of OHS visits for primary care, 34% of patients were issued a sickness certificate [26]. Work-related interventions were considered beneficial by patients in one-third of the cases at the OH physician's practice [15]. Of those suffering from mental disorders, 56% assessed interventions as beneficial. In another study, 60% of patients considered changes at the workplace beneficial for improving functional capacity [27]. Work-related interventions were carried out by Finnish OH physicians in 9% of visits for primary care [26]. All the main categories of diseases were represented in the visits that needed an intervention. Most interventions (15%) were needed for musculoskeletal disorders, followed by mental (12.8%), endocrine (12.7%), circulatory (10.8%), and skin disorders (10.9%). Another Finnish study showed that 19–37% of work-related visits led to recommendations or actions taken by OH physicians to improve working conditions [28].

The aim of this study was to examine the frequency of health problems which were work-related by definition of the WHO expert committee at the OH physicians' consultations for primary care. Another objective was to study associations between work-related health problems and OH physicians' interventions and recommendations.

Methods

Four OH physicians (including the author AI) out of twenty OH physicians of the private OHS unit of Lääkärikeskus—yhtymä (Doctor Centre Group) in Helsinki volunteered to participate in the study which was carried out over 5 weeks between May 2007 and February 2008 (2 weeks in the spring, 2 weeks in the autumn, and 1 week in the winter). The 5 weeks represented different seasons as in Finland the seasons may be very different because of the climate and this may result in different incidence of health problems [29]. In advance, it was calculated that the sample would be large enough during these 5 weeks. The weeks were not randomized, they were chosen so that all the participating doctors were working.

The OH physicians were aware of the purposes of the study. They had experience in OHS ranging from nine to over 20 years, and three were specialists in occupational health care (6 years specialist education). A pilot study was carried out to test the form which doctors filled after a consultation. The group of participating doctors discussed the methods of the study several times. The study was approved by the Ethical Committee of the Finnish Institute of Occupational Health.

Patients made the appointment mainly beforehand by telephone or via the internet, or were referred to the doctors by nurses. Some of the patients, mainly acute cases, were treated by GPs in the same medical centre. Consecutive patients were given a study information sheet in the waiting room and signed their consent before consultation with the OH physician. The consultation was conducted in the same manner as a usual consultation in an ordinary practice. After the consultation, OH physicians completed a form that included the main reasons (one or up to four) for the visit according to the ICD10 diagnoses. The electronic patient record system required one diagnosis to close the documentation of the consultation. The OH physicians assessed the work-relatedness and the effect on work ability of each reason. In this assessment of work-relatedness we used the concept of 'work-induced' in the same way as in the assessment of 'occupational disease' for the insurance companies. Work-induced health problems were mainly and highly likely (over 50% probability) to be induced by work. Partially work-induced was under 50% probable. The OH physicians assessed their prior knowledge of the employee's work, workplace, and health. They also assessed the interventions (carried out or intended) for work and health promoting activities of the consultation. Interventions could be advice and counselling regarding work-related issues during the visit, recommendations to speak with supervisors about matters concerning work, recommendations to arrange a meeting between the patient, supervisors, and OHS, a workplace visit, adaptations of work, or replacements.

The sample consisted of a total of 651 consultations of employees made for primary care. Health check-ups were excluded from the study. Thirty patients refused, and 93 (calculated from the patient lists) consultations were missing due to patients not receiving information and consent sheets. This number may include a few private visits. The study was carried out along the ordinary hectic practice of the OHS unit, so some of the patients did not receive the information and consent sheet due to forgetting to give them. Those missing patients were seen in the lists of each doctor as there were no signed consents or study forms for them. Also four entrepreneurs' consultations were excluded. The selection of the study sample is shown in Fig. 1.

Women (59%) were overrepresented in the study population compared to wage-earners in the whole Finnish population the proportion of which was 50% in 2008. The distribution of industries also differed from the national distribution. Employees were mainly in the private sector, and construction and financial intermediation were overrepresented. The proportion of blue-collar workers was 18%, whereas the national proportion is 35% [30].

The results of the visits of each doctor were combined to get an analysis which could be better generalized.

Cross-tabulations were tested using the chi square test. The relationship with interventions and explanatory variables were tested by logistic regression analysis adjusted for age (five categories) and gender. Statistical analyses were carried out by using the statistical package SAS version 9.1 (SAS Institute Inc, Cary, NC, USA).

Results

In the analyses, we used the first diagnosis of the visit due to uncertain documentation of other diagnoses. Musculoskeletal disorders (22%) were the main reason for the consultation, followed by mental (14%), respiratory (13%), and circulatory disorders (11%). Uncategorized symptoms were the main reason in 7% of cases. Disorders of the endocrine, nervous or digestive systems were the main reason in 5% and skin disorders and injuries in 4% of visits. Over half of the

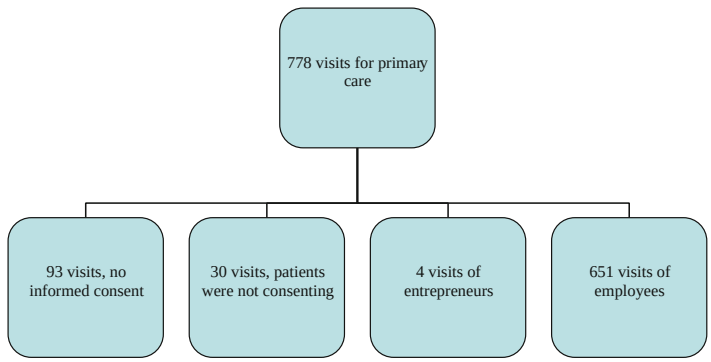

Fig. 1 Selection of the study sample ($n = 651$)

mental reasons for visits were for depressive disorders. Other common reasons were stress, anxiety, and insomnia. A third of musculoskeletal disorders were back problems and tension in the neck was the main diagnosis in disorders of the nervous system. Over two-thirds of respiratory disorders were acute infections. The health problem was new in 44% and symptoms had lasted for under 2 weeks in 24% of cases. OH physicians obtained new information about the work or workplaces of employees in 27% of visits. When the visit was not work-related the proportion was 17%. When the reason for the visit was work-induced and the work ability of the patient was impaired, the proportion increased to 57%. OH physicians reported recommending health promotion in 47% of cases; this proportion was the same regardless of the work-relatedness of the visit. Advice concerned physical exercise in 26%, nutrition in 16%, weight control in 8%, coping with stress in 7%, and coping with other life problems in 6% of the visits.

Of the all visits, 54% were for work-related health problems. Symptoms of these health problems were worsened or induced by work or symptoms caused impaired work ability leading to sickness absence. The main reason for a consultation was work-related significantly more frequently among women, blue-collar employees, and those at risk of permanent disability, or who needed rehabilitation. Visits were work-related more frequently for mental, musculoskeletal, and neurological disorders and injuries (Table 1).

Of the all main reasons for visits, OH physicians assessed 6% as mainly work-induced, and 12% as partly work-induced (Table 2). In 8% of cases, symptoms of the illness worsened at work. The illness caused disability for up to 2 weeks in 14% of cases and over 2 weeks in 7% of cases. In 31% of visits, illnesses impaired work ability, but employees could continue working. The episodes of disability (sickness absence) were caused partly and mainly by work-induced reasons in 20 and 17% of cases, respectively.

Of all the reasons that caused disability, 32% were due to mental and 28% due to musculoskeletal disorders. Mental reasons caused 53% and musculoskeletal reasons 30% of disability lasting over 2 weeks. Work-induced disability was due to mental and musculoskeletal reasons in 33 and 8% of cases, respectively. Sickness absence was needed in 47% of visits made for mental reasons, and in 38% of visits for musculoskeletal reasons (Table 2). Work worsened or induced symptoms for 38% of those suffering from musculoskeletal disorders, and in 68% of those with mental disorders. It seemed that mental health problems were more often work-induced in white-collar workers, and musculoskeletal disorders in blue-collar workers. Due to small sample, statistical significance of this difference could not be calculated.

OH physicians gave recommendations concerning work or workplaces in 21% of visits. In work-related visits this proportion was 54%. These interventions were advice in 17% of all visits, and other recommendations in 10% of visits. Recommendations to speak with one's supervisor about the matters concerning work was given in 4% of visits and a meeting between OHS, the employee and the supervisor was recommended in 3% of visits. A few recommendations concerned workplace visits by OHS, adaptations of work, and replacements.

Table 3 shows the associations between work-related interventions made by OH physicians and explanatory variables adjusted for age (five categories) and gender. Physicians' knowledge of work, employees' risk of permanent disability, and the need for rehabilitation were associated with interventions. The need for intervention increased considerably, if physicians obtained new information regarding work, the workplace, or working conditions from patients during the visit. Of the diseases, mental disorders were associated most strongly (OR 7.23, 95% CI 3.93–13.32) with interventions. When the symptoms of the illness before consultation had occurred over 2 weeks the association with interventions was significant. The strongest association (OR 16.09, 95% CI 9.29–27.87) with work-related visits was when the reason for visit was work-induced and the patient needed sick leave.

Discussion

This study showed that over half of the primary care visits to OH physicians were work-related in an OHS unit of private sector. The main health problem was caused either partially or mainly by work or work worsened symptoms in 27% of cases, or impaired work ability in 52% of cases. Musculoskeletal disorders were the main reason for visits, followed by mental disorders. Mental health problems were significant in OH physicians' practices, as in two-thirds of the cases work either caused or worsened symptoms, and the majority of long sickness absences were issued for mental health problems. Interventions were needed more frequently when the reason for the consultation was for mental or musculoskeletal health problems or disorders of the nervous system. Although OH physicians knew the working conditions of workplaces fairly well, they still gained new information from patients in 27% of visits.

A limitation of the study was the small sample which reduced the statistical power of the study. The industries and the proportion of blue-collar employees were different from that of the national population. The data was gathered in one private medical clinic, so the study cannot be generalized to all OHS units in Finland. However, private OHS clinics mostly function in similar ways, so the results are

Table 1 The distribution of the background variables of the visits ($n = 651$) to occupational health physicians according to work-relatedness of the visit

	n (%)	Work-related visit		*P* value
		No *n* (%)	Yes *n* (%)	
Gender				
Men	268 (41)	139 (52)	129 (48)	0.011
Women	383 (59)	160 (42)	223 (58)	
Age				
−29	51 (8)	20 (39)	31 (61)	0.076
30–39	127 (20)	49 (39)	78 (61)	
40–49	199 (31)	99 (50)	100 (50)	
50–59	192 (29)	85 (44)	107 (56)	
60–	82 (13)	46 (56)	36 (44)	
Occupational group				
White-collar employee	532 (82)	258 (49)	274 (52)	0.006
Blue-collar employee	119 (18)	41 (34)	78 (66)	
Personal doctor				
Yes	584 (80)	268 (46)	316 (54)	0.946
No	66 (10)	30 (45)	36 (55)	
Doctor's knowledge of the patient's medical history				
Yes	504 (77)	222 (44)	282 (56)	0.074
No	147 (23)	77 (52)	70 (48)	
Doctor's knowledge of the patient's work				
Yes	515 (80)	225 (44)	290 (56)	0.017
No	134 (20)	74 (55)	60 (45)	
Long term work ability				
No problem	443 (68)	252 (57)	191 (43)	<0.001
Lowered work ability, no risk to permanent disability	135 (21)	31 (23)	104 (77)	
Risk to permanent disability	46 (7)	6 (13)	40 (87)	
Missing	27 (4)			
Need of rehabilitation				
No need	408 (63)	47 (27)	128 (73)	<0.001
Yes	175 (27)	235 (58)	173 (42)	
Cannot say	68 (10)			
New information of workplaces				
Yes	176 (27)	50 (28)	126 (72)	<0.001
No	474 (73)	249 (53)	225 (47)	
Missing	1			
Recommendations related to work				
Yes	136 (21)	21 (15)	115 (85)	<0.001
No	515 (79)	278 (54)	237 (46)	
Health promotion				
Yes	303 (47)	140 (46)	163 (54)	0.895
No	348 (53)	159 (46)	189 (54)	
Symptoms before consultation				
Under 2 weeks	156 (24)	54 (35)	102 (65)	<0.001
2 weeks to 3 months	203 (31)	82 (40)	121 (60)	
3 months to 6 months	58 (9)	20 (34)	38 (66)	
Over 6 months	233 (36)	142 (61)	91 (39)	
Disease category				
Mental	90 (14)	8 (9)	82 (91)	<0.001
Nervous system	30 (5)	3 (10)	27 (90)	
Circulatory system	74 (11)	57 (77)	17 (23)	
Respiratory system	83 (13)	36 (43)	47 (57)	
Musculoskeletal	144 (22)	34 (24)	110 (76)	
Injury	26 (4)	7 (27)	19 (73)	
Others	204 (31)	154 (75)	50 (25)	
Total	651	299 (46)	352 (54)	

Table 2 Relations between health problems of the visits ($n = 651$) and work and work ability in all disease categories, musculoskeletal disorders, and mental disorders assessed by occupational health physicians

	All disease categories *n* (%, 95% CI)	Musculoskeletal disorders *n* (%, 95% CI)	Mental disorders *n* (%, 95% CI)
		144 (22, 19–26)	90 (14, 11–17)
No work-induced	474 (73, 69–76)	89 (62, 53–70)	29 (32, 23–43)
Work worsens symptoms	54 (8, 6–11)	16 (11, 6–17)	11 (12, 6–21)
Partially work-induced	80 (12, 10–15)	29 (20, 14–28)	31 (34, 25–45)
Mainly work-induced	41 (6, 5–8)	10 (7, 3–12)	18 (21, 12–30)
No effect on work ability	313 (48, 44–52)	36 (25, 18–33)	11 (12, 6–21)
Work impairs work ability, but can work	203 (31, 28–35)	70 (49, 40–57)	36 (40, 30–51)
Disability under 2 weeks	90 (14, 11–17)	24 (17, 11–24)	19 (21, 13–31)
Disability over 2 weeks	43 (7, 5–9)	13 (9, 5–15)	23 (26, 17–36)

Table 3 Odds ratios (OR) and their 95% confidence intervals (CI) of work-related interventions during occupational health physicians' consultations ($n = 651$) in logistic regression analysis adjusted for age and gender

	OR	95% CI
Occupational group		
White-collar employee	1.00	
Blue-collar employee	0.88	0.52–1.51
Personal doctor		
No	1.00	
Yes	1.35	0.68–2.67
Doctor's knowledge of patient's medical history		
No	1.00	
Yes	1.66	1.00–2.76
Doctor's knowledge of patient's work		
No	1.00	
Yes	2.28	1.29–4.02
Long term work ability		
No problem	1.00	
Lowered work ability, no risk to permanent disability	4.57	2.91–7.18
Risk to permanent disability	5.11	2.52–10.33
Need of rehabilitation		
No need	1.00	
Yes	2.71	1.77–4.15
New information of workplaces		
No	1.00	
Yes	12.82	8.15–20.18
Health promotion		
No	1.00	
Yes	2.24	1.51–3.31
Symptoms before consultation		
Under 2 weeks	1.00	
2 weeks to 3 months	1.81	1.02–3.23
3 months to 6 months	2.77	1.32–5.82
Over 6 months	2.10	1.19–3.69
Disease category		
Others	1.00	
Mental	7.23	3.93–13.32
Nervous system	5.64	2.36–13.47
Circulatory system	1.09	0.46–2.59
Respiratory system	0.74	0.30–1.81
Musculoskeletal	3.01	1.69–5.38
Injury	2.41	0.87–6.69
Work-related visit		
No	1.00	
Yes	6.33	3.84–10.44
Work-related visit		
No	1.00	
Lowered work-ability	1.86	0.99–3.51
Work-induced reason	5.65	1.62–19.78
Work-induced reason and lowered work ability	16.09	9.29–27.87

suggestive regarding other private OHS clinics, which nowadays offer OHS to half of all Finnish employees [31]. The study population did not comprise all patients visiting OHS units, as a part of them were treated by GPs. Because this selection, the work-relatedness may be emphasized in this study. Of those patients who did not participate there is not any information, so some selection bias is possible. The participation rate is not exact, but regarding the rate of refusal and drop-out due to patients not receiving the information and consent sheets, it still is about 80%.

In this study, the assessment of the work attribution to each health problem was defined by the similar way as it is done with occupational diseases which doctors have to define for the insurance companies. This is a procedure in which OH physicians are educated. The assessment is subjective to some extent but all participating OH physicians were experienced so the assessment may be quite reliable. In addition, the causality between work and the health problem was assessed during one consultation which may weaken the reliability. In British studies, reliability of diagnoses of work-related mental and musculoskeletal disorders made by OH physicians compared with clinical specialists has been good [32, 33]. Compared with physicians' assessments of work-relatedness of health problems, self-reporting may overestimate attribution to work [34]. In another study, subjects with MSDs assessed their pain as work-related only somewhat more frequently than physicians. However, there were a considerable disagreement as to which cases were work-related [35]. Compared with GP reporting, OH physicians have been shown to report higher levels of mental ill health as work-related than GPs. This suggests differences in case mixes or reporting thresholds [36].

In this study OH physicians were responsible for occupational health care and primary care of the employees of their client companies, so they are obliged to give treatment to all kinds of health problems of the employees of the company. However, patients may favour particular doctors for certain health problems and therefore some selection of patients is possible. Combining the results of the visits of OH physicians reduces this bias.

The study was cross-sectional, thus, interventions and how they were carried out were not followed up. Therefore, effectiveness of the interventions could not be studied.

Compared to other studies, the proportion of mental health problems as reasons for visits to OH physicians has increased to 14% [15, 26]. It is also much higher compared to visits due to mental health problems (2%) to health centre physicians in municipal health centres [37]. The proportion of such work-related health problems that were caused or aggravated by work was not as high as in the earlier Finnish study, but if work disability was comprised the proportion was higher [15]. The proportion of

work-related mental health problems was higher in the present study. This may partly be due to a larger proportion of white-collar workers. In other studies, up to one third of patients in general practice had health problems that were caused by work and up to two-thirds had symptoms that were worsened by work [27, 38].

This study confirms the earlier findings of the Finnish study that musculoskeletal and mental disorders are most frequently related to work in the OH physicians' consultations [15]. Also in British and American studies musculoskeletal and mental disorders have been assessed work-related most frequently [3, 4, 16, 18]. In this study, disorders of the nervous system were also often work-related. This is probably due to the classification of tension in the neck as a nervous disorder. It could also be classified as a musculoskeletal illness. Injuries have also usually been regarded as work-related, as in this study [5]. In this study skin problems were not related to work as frequently as in an Australian study in general practice [6]. One reason may be the disproportion between industries in our study.

Work ability was assessed by OH physicians based on the main reason for the visit. In this study a sickness certificate was issued in 20% of cases, which is less than in an earlier study (34%) [26]. This may be due to more frequent visits for respiratory disorders in the earlier study, which may cause more frequent, short sickness absences. This study showed the importance of mental health problems as they caused the most long sickness absences. Over half of the sickness absences exceeding 2 weeks were for work-related reasons. In a Dutch study, 34% of sickness absences over 1 month were caused by work-related health problems [25]. Moreover, recurrences of sickness absences for musculoskeletal and mental disorders are common after returning to work [39]. This implies that monitoring of these employees by health care providers should be active. This could also be carried out through primary care in OHS. Our study was cross-sectional, so the actual length of sickness absence or recurrence could not be examined.

Work-related interventions were higher (in 21% of visits) in this study than in a study which was carried out in 1989–1991 (8.8.%) [26]. Another Finnish study showed that in the OHS unit of a chemical factory, interventions were carried out in 37% of visits and in the OHS unit of a municipal health centre in 19% of visits that were for work-related health problems [28]. In this study, the proportion was even higher (54%) among the visits for work-related health problems. In Räsänen's study, musculoskeletal disease was a significant estimator for a work-related intervention compared with the diagnosis categories of respiratory diseases, diseases of the nervous system, and injuries [26]. In our study, work-related interventions were associated with musculoskeletal disorders, mental disorders, and disorders of the nervous system. In a Dutch study, OH physicians applied work-related interventions for 17.3% of employees who were sick-listed for 12–20 weeks due to mental health problems, and contacted the employer of 10.6% of employees [40]. In the same study, GPs discussed the working conditions less often (28%) than OH physicians (43%) and contacted seldom the employer (1.9%) and never advised work-related interventions. In reducing work-related musculoskeletal and mental disorders and preventing disability caused by them the most effective interventions have been in combinations of measures and engaging workplace in the process [41, 42]. Measures comprised biomedical treatment, individual support, ergonomic workplace interventions, activity programmes, and work arrangements. Early consultation with the OH physician has been shown to reduce sickness absences [43]. This study suggests that when the employee has suffered symptoms of the illness for 2 weeks, the need for interventions aimed at work increases.

In conclusion, this study showed that a considerable part of Finnish OH physicians' work in primary care consists of treatment of work-related health problems and assessment of work ability. Mental health problems and musculoskeletal disorders are the most important health problems in OHS today, and OH physicians are in a crucial position in early treatment, in the prevention of disability, and in enabling employees to return to work. This study suggests that especially musculoskeletal and mental health problems are often caused by work and they impair work ability, therefore treatment of these health problems should be managed by OH physicians. If primary care is not offered by OHS as in most countries, coordination and case management in these health problems could be in OHS. Interventions aimed at workplaces are often needed in these cases which also can be carried out by OH physicians in contrary to GPs. Primary care in OHS is also a significant way to gain current information of changes of work, workplaces, and work communities. As work-related health problems could be partly preventable, OH physicians could increase the amount of interventions aimed at workplaces, as they have knowledge of work and contacts with the workplaces. This study showed that primary care in OHS is closely related to the preventive role of the OHS.

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