Annukka Ikonen

Primary care visits in the Finnish occupational health services and their connections to prevention and work-related factors
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Abstract


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


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


I Finland erbjuder de flesta arbetsgivare sjukvårdsstjänster för sina anställda utöver förebyggande företagshalsovårdsstjänster (FHVT). Syftet med detta arbete är att utreda rollen av FHVT i yrkesarbetande personers hälsa och att utreda sambandet mellan sjukvårdsbesök hos FHVT och förebyggandet och arbetsrelaterade faktorer. Denna studie visar att över 50 % av anställda endast använder FHVT som serviceproducent för sjukvård och användningen av offentlig hälsostöd minskades.


Nyckelord: företagshalsovård, företagstjänster, företagshalsovårdsstjänster, mottagningsbesök, förebyggande, arbetsrelaterade faktorer, hälsovårdsstjänster – användning
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Espoo, January 2012

Annikka Ikonen
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Annukka Ikonen (formerly Kimanen)
### ABBREVIATIONS

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

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 healthcare 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 (Kauppinnen 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-Krispjin 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, 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.
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(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). Räätänen and co-authors found that occupational class did not associate with physicians’ visits in primary care or intended use of OHS (Räätänen 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 hypothized 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; Jezelenberg 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 (Sinnokki 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 (Kouvonén 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
Primary care visits in the Finnish occupational health services and their connections to prevention...

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.**

<table>
<thead>
<tr>
<th>Target</th>
<th>Level 1, primary</th>
<th>Level 2, secondary</th>
<th>Level 3, tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Workplace, work community, individual</td>
<td>Individuals susceptible to impaired work ability</td>
<td>Individuals with impaired work ability</td>
</tr>
<tr>
<td></td>
<td>Needs of workplaces</td>
<td>Symptoms of diseases, individual’s own initiative, initiative of employer or OHS</td>
<td>Disease, sick leave, impaired work performance, follow-up in OHS</td>
</tr>
<tr>
<td></td>
<td>Prevention, promotion of healthy lifestyle, improvements in workplace and work community, workplace health promotion programmes</td>
<td>Problem solving, treatment, work adaptation, replacement, improvements in workplace and work community</td>
<td>Treatment, rehabilitation, education, replacement, improvements in workplace and work community</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Data source</th>
<th>Type of study</th>
<th>Population</th>
<th>Sample size</th>
<th>Main outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study I</td>
<td>Statistics of Kela (1996–2005)</td>
<td>Analysis of the statistics on the use of occupational health care</td>
<td>Employed population</td>
<td>All employees in the applications for reimbursement</td>
</tr>
<tr>
<td>Study II</td>
<td>Health 2000 Study</td>
<td>Cross-sectional survey (interview, health examination, questionnaires)</td>
<td>30–64-year-old working employees</td>
<td>n = 3126</td>
</tr>
<tr>
<td>Study III</td>
<td>Work and Health Survey 2006</td>
<td>Cross-sectional survey (computer-assisted telephone interview)</td>
<td>25–64-year-old working employees and self-employed</td>
<td>n = 1753</td>
</tr>
<tr>
<td>Study IV</td>
<td>Work and Health Survey 2006</td>
<td>Cross-sectional survey (computer-assisted telephone interview)</td>
<td>25–64-year-old working employees</td>
<td>n = 1636</td>
</tr>
<tr>
<td>Study V</td>
<td>OH physicians’ practice</td>
<td>Cross-sectional, clinical study</td>
<td>Employees in OH physicians’ practice</td>
<td>n = 651</td>
</tr>
</tbody>
</table>

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 (Heistar 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/m² 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 1. Between 1996 and 2005 the proportion of employees who had access to primary care through OHS increased from 84% to 91% (Study 1). 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.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees having OHS</td>
<td>1.43</td>
<td>1.76</td>
<td>+23</td>
<td>1.88</td>
<td>+7</td>
</tr>
<tr>
<td>Employees having access to primary</td>
<td>1.2</td>
<td>1.6</td>
<td>+33</td>
<td>1.73</td>
<td>+8</td>
</tr>
<tr>
<td>care in OHS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visits for primary care</td>
<td>3.8</td>
<td>4.8</td>
<td>+26</td>
<td>5.25</td>
<td>+10</td>
</tr>
<tr>
<td>Visits for health check-ups</td>
<td>0.91</td>
<td>0.96</td>
<td>+5</td>
<td>1.02</td>
<td>+6</td>
</tr>
<tr>
<td>Visits for primary care per employee</td>
<td>3.16</td>
<td>2.99</td>
<td>−5</td>
<td>3.03</td>
<td>+1</td>
</tr>
<tr>
<td>Visits for health check-ups per</td>
<td>0.64</td>
<td>0.55</td>
<td>−14</td>
<td>0.54</td>
<td>0</td>
</tr>
<tr>
<td>employee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory tests for primary care</td>
<td>1.62</td>
<td>2.4</td>
<td>+48</td>
<td>2.2</td>
<td>−9</td>
</tr>
<tr>
<td>per employee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiographic tests for primary care</td>
<td>0.22</td>
<td>0.24</td>
<td>+9</td>
<td>0.23</td>
<td>−3</td>
</tr>
<tr>
<td>per employee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th></th>
<th>Physician</th>
<th>Nurse</th>
<th>Physiotherapist</th>
<th>Psychologist</th>
<th>Specialist clinician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visits for primary care</td>
<td>+14</td>
<td>+5</td>
<td>−11</td>
<td>−42</td>
<td>+29</td>
</tr>
<tr>
<td>Visits for primary care per employee</td>
<td>+5</td>
<td>−3</td>
<td>−18</td>
<td>−38</td>
<td>+20</td>
</tr>
<tr>
<td>Health checkups</td>
<td>+7</td>
<td>+4</td>
<td>+3</td>
<td>+64</td>
<td>+32</td>
</tr>
<tr>
<td>Health check-ups per employee</td>
<td>0</td>
<td>−3</td>
<td>−4</td>
<td>+45</td>
<td>+22</td>
</tr>
</tbody>
</table>

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.

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

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).**

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of visits (S III / S IV)</td>
<td>Men who made visits (S II / S III / S IV), %</td>
</tr>
<tr>
<td>Occupational health physician</td>
<td>0.9 / 0.93</td>
<td>38 / 43 / 46</td>
</tr>
<tr>
<td>Health centre physician</td>
<td>0.3 / –</td>
<td>28 / 17 / –</td>
</tr>
<tr>
<td>Private physician</td>
<td>0.2 / –</td>
<td>15 / 12 / –</td>
</tr>
<tr>
<td>Hospital outpatient clinic physician</td>
<td>0.2 / –</td>
<td>16 / 11 / –</td>
</tr>
<tr>
<td>Occupational health nurse</td>
<td>– / 1.05</td>
<td>44 / – / 44</td>
</tr>
</tbody>
</table>

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.

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

<table>
<thead>
<tr>
<th></th>
<th>Occupational health nurse</th>
<th>Occupational health physician</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td><strong>Study II</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic impairing illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.00 (1.61–2.49)</td>
<td>1.50 (1.23–1.82)</td>
</tr>
<tr>
<td>No</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Work ability index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>2.40 (1.80–3.20)</td>
<td>1.72 (1.33–2.23)</td>
</tr>
<tr>
<td>Good</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Study III</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-standing illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, affects work</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>No effect on work</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>No long-standing illness</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td><strong>Study IV</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-standing illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, harmful to work</td>
<td>2.44 (1.99–2.99)</td>
<td>1.37 (1.09–1.72)</td>
</tr>
<tr>
<td>No harm on work</td>
<td>1.66 (1.38–1.99)</td>
<td>1.12 (0.92–1.35)</td>
</tr>
<tr>
<td>No long-standing illness</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Work-related symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.33 (1.12–1.58)</td>
<td>1.21 (1.02–1.44)</td>
</tr>
<tr>
<td>No</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
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 impaiired 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.
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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