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The Health, Work Ability and Healthcare Needs of
Finnish Female Prisoners



ACADEMIC DISSERTATION

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*As prison sentences have been designed for men
and by men, women are always an exception*
(Kurtén-Vartio, 2007)

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LIST OF ORIGINAL COMMUNICATIONS

The dissertation is based on the following original publications, which are referred to in the text by Roman numerals I–IV.

- I Viitanen P, Vartiainen H, Aarnio J, von Gruenewaldt V, Hakamäki S, Lintonen T, Mattila AK, Wuolijoki T, Joukamaa M (2011): Hepatitis A, B, C and HIV infections among Finnish female prisoners – Young females a risk group. *J Infection* 62:59–66.
- II Viitanen P, Vartiainen H, Aarnio J, von Gruenewaldt V, Lintonen T, Mattila AK, Wuolijoki T, Joukamaa M (2011): Childhood maltreatment and mental disorders among Finnish prisoners. *Int J Prisoner Health* 7(4):17–25.
- III Viitanen P, Vartiainen H, Aarnio J, von Gruenewaldt V, Hakamäki S, Lintonen T, Mattila AK, Wuolijoki T, Joukamaa M (2013): Finnish female prisoners – Heavy consumers of health services. *Scand J Public Health* 41:479–485.
- IV Viitanen P, Vartiainen H, Aarnio J, von Gruenewaldt V, Hakamäki S, Lintonen T, Mattila AK, Wuolijoki T, Joukamaa M (2012): Work ability and treatment needs among Finnish female prisoners. *Int J Prisoner Health* 8(3/4):99–108.

In addition some unpublished data are presented.

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ABBREVIATIONS

CI	Confidence interval
CSA	Childhood sexual abuse
CPA	Childhood physical abuse
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders – 4 th edition
EIA	Enzyme immunoassay
HAV	Hepatitis A virus
HBV	Hepatitis B virus
HBcAb	Hepatitis B core antibodies
HBsAg	Hepatitis B surface antigen
HCV	Hepatitis C virus
HCVAb, anti-HCV	Hepatitis C antibodies
HIV	Human immunodeficiency virus
HIVAb	Human immunodeficiency virus antibodies
ICD-10	The International Statistical Classification of Diseases 10 th revision
IDU	Intravenous drug use
IDUs	Intravenous drug users
OR	Odds ratio
S-ALT	Serum alanine aminotransferase
S-GT	Serum gamma glutamyltransferase
SCID-I	The Structural Clinical Interview for DSM-IV Axis I Disorders
SCID-II	The Structural Clinical Interview for DSM-IV Axis II Disorders
SU	Substance abuse

ABSTRACT

In Finland, the health of female offenders has never before appropriately researched. Prison studies elsewhere show that female prisoners often have more health problems than male prisoners. Especially mental disorders, infectious diseases and illicit drug use are common among female inmates. The majority of prisoners are men and most prison studies have not taken gender differences into account. The aims of the present dissertation were as follows: to find out the prevalence of hepatitis and HIV infections and their risk factors among Finnish female prisoners; to assess the frequency and gender differences in childhood abuse and the connections between maltreatment in childhood and substance abuse and mental health; to study lifetime somatic diseases, the use of health care services and prescription medicines; to assess the work ability and employment history and need for treatment of female prisoners, and compare all the results to those of male prisoners.

This dissertation is part of a national prison health survey 2006. Data collection was between October 2005 and October 2007; the majority of the data was obtained in 2006. The material of the present study consisted of 101 females and 309 male prisoners for purposes of comparison.

The prevalence of hepatitis C virus (HCV) antibodies was 52%, hepatitis B surface antigen (HBsAg) 0%, hepatitis A virus (HAV) antibodies 38% and human immunodeficiency virus (HIV) antibodies 1% among women, 44%, 0.7%, 4% and 0.7% respectively among men. Among women, 71% of age group 16-24 had HCV. Among women, HCV was associated only with intravenous drug use (IDU) and syringe/needle sharing, whereas among men also with tattoos, cumulative years in prison and age. Both forms of childhood abuse studied were significantly more common among females than males (physical abuse 25% vs. 15% and sexual abuse 32% vs. 7%). Associations between childhood abuse and family integrity with substance abuse and mental health were different in males and females. The gender differences did not concur with those reported in studies on general populations. At least half of the women prisoners had self-reported somatic diseases in each of the various disease categories. A high proportion of women having somatic illnesses had been treated by a physician. Four out of five women regularly took some prescription medicine. Over 90% of the females reported lifetime hospital care and 70% lifetime use of psychiatric services. Regarding physical diseases and the use of health care services, the gender difference varied and was not so apparent in all disease groups. The females had used psychiatric and substance abuse

services significantly more commonly than the males. Female recidivists had accidents/injuries significantly more commonly and were treated twice as often in psychiatric departments than first-time offenders. Among women, 78% were unemployed and only six percent were employed, whereas among men, the proportion of those employed was four times greater than for women. Of the women 42% were unable to work, of the men 11%. Substance abuse disorders were the most common reason for impaired work ability (over 70% in both genders). Among the women, other mental disorders were the second most common reason (39%) and somatic diseases caused impairment in 23%. Crimes of violence were significantly more common among prisoners with limited working capacity. Need for treatment was found in 94% of the women and 90% of the men. In both genders, the majority of treatment needs were for mental disorders.

In conclusion, female prisoners have a high prevalence of HCV, which is in accordance with the high prevalence of IDU among Finnish prisoners. The risk factors for infections exhibit gender differences. There were also several gender differences between childhood adversities and substance abuse or lifetime mental disorders. Childhood sexual abuse is well known to be more common among women than men, but among Finnish female prisoners physical abuse has also been a significantly more common experience. The frequent use of health care services by female prisoners is in accordance with their high morbidity related especially to substance abuse, mental health disorders, infections and injuries. Finnish female prisoners have serious problems with alcohol consumption and drugs and frequently other mental disorders, which impairs their work ability, employability and causes their need for treatment.

It is important to ascertain the gender differences, and to take them into account in the planning of prison health services as well as other prison functions. The implementation of efficient prisoner treatment and rehabilitation programmes requires up-to-date information on prisoners' health, need for treatment and ability to work. In future, there will be a need to regularly evaluate the changes in prisoners' health and health-related factors, and account should be taken of the differences among minority groups such as females. Women have been a growing group of offenders and they will serve longer prison sentences.

TIIVISTELMÄ

Suomalaisten naisvankien terveydentilaa ei ole koskaan aiemmin tutkittu asianmukaisesti. Muualla tehdyt tutkimukset osoittavat, että naisvangeilla on miesvankeja enemmän terveysongelmia. Erityisesti mielenterveydenhäiriöt, tartuntataudit ja huumeidenkäyttö on naisvangeilla yleisempää. Vankien enemmistö on miehiä ja useimmissa vankilatutkimuksissa ei naisten tutkimustuloksia eikä sukupuolieroja ole otettu huomioon. Tämän väitöstutkimuksen tarkoituksena oli tutkia seuraavia asioita suomalaisilla naisvangeilla: selvittää virushepatiittien ja HIV -infektioiden esiintyvyydet ja riskitekijät; arvioida lapsuuden kaltoin kohtelun esiintyvyyttä ja sukupuolieroja sekä lapsuuden kaltoin kohtelun yhteyttä päihteiden käyttöön ja mielenterveyteen; tutkia elinaikaisia somaattisia sairauksia ja terveyspalveluiden sekä lääkkeiden käyttöä; arvioida työkykyä ja työhistoriaa sekä hoidontarvetta, ja verrata näitä tuloksia miesvankeihin.

Tämä väitöstutkimus on osa kansallista vankien terveystutkimusta vuodelta 2006. Aineisto kerättiin lokakuun 2005 ja lokakuun 2007 välisenä aikana; pääosa aineistosta kerättiin vuonna 2006. Aineisto koostuu 101 naisvangista ja vertailujoukkona on 309 miesvankia.

C-hepatiitti vasta-aineiden esiintyvyys naisvangeilla oli 52 %, hepatiitti B pinta-antigeenin 0 %, A-hepatiitti vasta-aineiden 38 % ja HIV vasta-aineiden 1 %. Miehillä vastaavat luvut olivat 44 %, 0,7 %, 4 % ja 0,7 %. 16–24-vuotiailla naisilla 71 %:lla oli C-hepatiitti vasta-aineita. Sukupuolen ja C-hepatiitin välillä ei ollut merkitsevää yhteyttä. Naisilla C-hepatiitti oli yhteydessä suonensisäiseen huumeiden käyttöön sekä ruiskujen ja neulojen yhteiskäyttöön. Miehillä se oli yhteydessä myös tatuointeihin, vankilavuosiin ja ikään. Lapsuuden fyysinen ja seksuaalinen hyväksikäyttö oli yleisempää nais- kuin miesvangeilla (fyysinen 25 % vs. 15 %, seksuaalinen 32 % vs. 7 %). Lapsuuden hyväksikäytön sekä perheen kiinteyden yhteydet päihteiden käyttöön ja mielenterveyteen olivat erilaiset nais- ja miesvangeilla sekä verrattuna normaaliväestöön. Vähintään puolet naisista ilmoitti somaattisen sairauden kussakin tutkitussa sairausr ryhmässä. Suurin osa heistä oli ollut kyseisen sairauden vuoksi lääkärin hoidossa. Neljä viidesosaa naisista käytti säännöllisesti jotakin lääkettä. Yli 90 % naisista oli ollut joskus somaattisessa sairaalahoidossa ja 70 % oli joskus käyttänyt mielenterveyspalveluja. Naisvangit olivat käyttäneet merkitsevästi yleisemmin mielen-terveys- ja päihdehoitopalveluja kuin miehet. Vankilatuomion uusineilla naisilla

oli yleisemmin tapaturmia kuin ensikertalaisilla ja heitä oli hoidettu kaksi kertaa yleisemmin psykiatrisella osastolla.

Naisista 78 % oli työttömänä ja kuusi prosenttia työssä. Miehillä työssä olleiden osuus oli nelinkertainen naisiin verrattuna. Naisista 42 % ja miehistä 11 % oli työkyvyttömiä. Yleisin syy työkyvyn heikentymiseen olivat päihdesairaudet (yli 70 %:lla molemmista sukupuolista). Naisilla toiseksi yleisin syy olivat mielenterveyden häiriöt (39 %). Somaattiset sairaudet heikensivät työkykyä 23 %:lla naisista. Väkivaltarikos oli merkittävästi yleisempi vangeilla, joilla oli heikentynyt työkyky. Hoidontarvetta oli yli 90 %:lla vangeista ja suurimmalla osalla syynä olivat mielenterveyden häiriöt.

Naisvangeilla C-hepatiitti on hyvin yleinen ja se liittyy suomalaisten vankien keskuudessa hyvin yleiseen suonensisäisten huumeiden käyttöön. Tutkimus osoitti, että riskikäyttäytymisessä on sukupuolieroja. Sukupuolet erosivat myös lapsuuden kaltoin kohtelun suhteen ja eroja oli myös sen liittymisessä myöhempään päihteen käyttöön ja mielenterveyden häiriöihin. Yleisesti on osoitettu naisilla olevan enemmän lapsuuden seksuaalista hyväksikäyttöä, mutta suomalaisilla naisvangeilla myös lapsuuden fyysinen pahoinpitely oli yleisempää kuin miesvangeilla. Naisvangeilla oli paljon terveysongelmia ja terveyspalveluiden runsas käyttö liittyi etenkin päihteenkäyttöön, mielenterveyden häiriöihin, tartuntatauteihin ja tapaturmiin. Suomalaisilla naisvangeilla on vakavia alkoholi- ja huumeongelmia sekä yleisesti mielenterveyden häiriöitä, jotka heikentävät heidän työkykyään, työllistymistään ja aiheuttavat hoidontarvetta.

Vankiloiden terveyspalveluiden sekä muiden toimintojen suunnittelussa on tärkeitä ottaa huomioon sukupuolten väliset eroavuudet. Vankien vaikuttavien hoito- ja kuntoutusohjelmien järjestäminen edellyttää ajantasaista tietoa vankien terveydentilasta, hoidontarpeista ja työkyvystä. Tarvitaan säännöllistä vankien terveydentilan ja siihen liittyvien tekijöiden seuranta ja vähemmistöryhmien, kuten naisvankien, erilaisten tarpeiden huomioonottamista. Naiset ovat olleet kasvava vankiryhmä ja he viettävät yhä pidempiä aikoja vankilassa.

1 INTRODUCTION

Prisoners are in many ways a marginalized section of the population: their socioeconomic status is poorer than the rest of the population, they have many health problems and high mortality (Fazel & Benning, 2006; Fazel & Baillargeon, 2011; Joukamaa, 1998; Sailas et al., 2005). Prison studies elsewhere show that women often have more health problems than men prisoners (World Health Organization, Regional Office for Europe, 2009). Mental disorders and infectious diseases and illicit drug use are especially common among female inmates, likewise histories of sexual and physical abuse and violence (World Health Organization, Regional Office for Europe, 2009).

Prison policies often overlook the special needs of women and their health. Although women should enjoy the same rights as men, prison systems were primarily designed for men, and many prisons lack adequate facilities to protect women's rights or promote their health. There is also lack of data and research on women's health status while in prison. Results from studies on male prisoners cannot be simply generalized to females. Quite often in prison studies it is not possible to find results for females, because male offenders are the majority. Moreover, comparison with the morbidity of general population is difficult given the different age, social class and other socio-demographic background distribution of prisoners.

A scientific basic study on Finnish prisoners' state of health, need for treatment and capacity for work, was carried out in the Prison Service in 1985 (Joukamaa, 1991). The study revealed that a great part of the prisoners had mental disorders, physical illnesses were common and the prisoners were in need of various medical treatments. In 1992, another cross-sectional study with a smaller sample group (Joukamaa, 1994) was compared to that research. The study of 1992 showed that mental disorders, in particular disorders related to substance abuse, had increased. However, little is known about the health status of Finnish female prisoners because few females had participated in the earlier Finnish studies (33 women in 1985 and 40 in 1992).

In Finland, the Prison Health Care Unit is an independent administrative unit of the Criminal Sanctions Agency in the Ministry of Justice. In every prison there is a clinic with one or more nurses and full-time or part-time physician. Moreover, there are two prison hospitals. One hospital is for psychiatric patients and has two departments, one in the Finnish city of Turku and one in the town of Vantaa. Another prison hospital is located in the town of Hämeenlinna and is mainly for somatic patients, but it has also a small department for the psychiatric treatment of female prisoners. The Finnish

Prison Health Care Unit offers good general health care services and special health care (except psychiatry) is arranged together with public or private special health care services.

In the 1980's the importance of having up-to-date information on prisoners' illnesses was already emphasized (Vankeinhoito-osasto, 1982). The implementation of a long-term and efficient prisoner treatment and rehabilitation programme requires regular evaluation of prisoners' health, need for treatment and work ability. It is also important to know the gender differences, and to take them into account in the planning of prison health services as well other prison functions.

The present study is the first comprehensive scientific investigation on the health, health care needs and work ability of Finnish female prisoners.

2 REVIEW OF THE LITERATURE

2.1 The concept of prison population

The prison population and prisons differ greatly from one country to another, even within Western Europe. For example, the correctional status of offenders, imprisonment policy and drug policy vary between countries. Thresholds for being imprisoned vary in different societies.

The organization of prisons varies across countries. In Europe, most prisons are run by the governments through the respective ministries of justice. In the U.S.A. there are private prisons run by companies as an independent 'factory' or 'concern'. In England, too, there are private correctional institutions (Andersen, 2004).

The results of various prison studies depend not only on the study design but also on the country and the time of the research (Andersen, 2004). Comparing prison studies is therefore difficult. Even in the same country, criminal legislation and its application in practice change over the years as does the profile of crimes committed. These changes influence who will be imprisoned and how long sentences will be served. The liability to penalty of acts such as driving under influence and drug-related crimes has varied. Also, the prison population is at the same moment not homogenous. In Finland, we have remand prisoners, sentenced prisoners, fine defaulters, life sentence prisoners and also offenders sentenced to community service. Remand prisoners are in the pre-trial phase of their possible imprisonment and have not yet been sentenced. Sentenced prisoners serve their time either in closed or open prison units or on supervised parole. Fine default prisoners serve conversion sentences for unpaid fines. Life sentence prisoners serve sentences with no predetermined duration; at present in Finland, a life sentence is usually over 12 years and release from prison is granted on the strength of an application and a court order.

2.2 The number of prisoners

More than 9.8 million people are held in penal institutions throughout the world, mostly as pre-trial detainees (remand prisoners) or as sentenced prisoners (Walmsley, 2009). Almost half of these are in the United States, Russia or China. The United

States has the highest prison population rate in the world, 756 per 100,000 of the national population, followed by Russia (629), Rwanda (604), St Kitts & Nevis (588), Cuba (approximately 531), U.S. Virgin Islands (512), British Virgin Islands (488), Palau (478), Belarus (468), Belize (455), Bahamas (422), Georgia (415), American Samoa (410), Grenada (408) and Anguilla (401). Almost three fifths of countries (59%) have rates below 150 per 100,000. In Finland, the prison population rate was 64 per 100,000 (1st January 2008). Prison population rates vary between different regions of the world, but also between different parts of the same continent. In Africa, the median rate for western African countries is 35 per 100,000 whereas for southern African countries it is 325. In Asia, the median rate for south central Asian countries is 53 whereas for central Asian countries it is 184. In Europe, the median rate for southern and western countries is 95 whereas for countries whose territories span both Europe and Asia (e.g. Russia and Turkey) it is 229. In Oceania (including Australia and New Zealand), the median rate is 103.

Prison populations are growing in many parts of the world (Walmsley, 2009). The eighth edition of the World Prison Population List shows that the number of prisoners has risen in 71% of countries (Walmsley, 2009). Research in the U.S.A. has shown a close relationship between drug use and crime (Lo, 2004). Harsh sentences for drug-related crimes had increased the prison population in the U.S.A. There a high proportion of individuals processing through the criminal justice system were drug users, drug traffickers or the like (Lo, 2004).

The prison population in Finland begun to increase at the beginning of the 21st century and was highest in the middle of the 2000s when there were 36% more prisoners than at the beginning of the 2000s. In 2006 the prison population began to decrease and in 2010 the daily average number of prisoners was 3,291 (Blomster, Linderborg, Muiluvuori, Salo, & Tyni, 2011). The proportion of prisoners serving long sentences has increased in the 21st century. Most of the Finnish prisoners sentenced in 2011 belonged to the age group 30–39 years: 33% of all and 31% of women (Rikosseuraamuslaitos, 2011).

2.3 Special features of prison studies

In prison study design, one must take into account factors related to the prison, the population, the methodology and the purpose of the research.

Most prison populations have a different demographic composition from that of the general population (Andersen, 2004). Males are more frequent in criminal populations; 2–9% of the total prison population are women (Walmsley, 2006). The gender difference may be even greater e.g. in high security prisons and long-term facilities (Andersen, 2004). Studies may be confined to either males or females or involve both genders. The age of prisoners is generally between 18 and 35 years (Andersen, 2004).

However, the population of older prisoners (subjects over 55 or 60 years) is growing (Fazel & Baillargeon, 2011). This trend has been attributed to various factors such as the imposition of longer sentences, more restrictive parole policies and an increasing number of ageing adults committing serious crimes. In Finland the proportion of prisoners over 50 years has increased from 9% to 14% in the 21st century (Blomster et al., 2011). The mean age of Finnish prisoners is 36 years and women are one year older than men. In the prison population, there is an overrepresentation of lower social classes and ethnic minorities (Andersen, 2004; Joukamaa, 1991).

Remand prisoners' samples often have a much higher turnover than samples of sentenced prisoners. This impairs the opportunity to carry out longitudinal studies among prisoners (Andersen, 2004). The drop-out rate due to release from prison may be high. In cross-sectional studies, this is less important. The number of previous sentences is connected to socio-demographic factors, type of offences and substance abuse (Hypén, 2004).

Substance abuse problems are frequent in prison samples and especially in the early phase of imprisonment, symptoms of withdrawal may tend to bias findings of psychiatric symptoms (Andersen, 2004). Psychometric tools have been only rarely validated in prison settings. It is known that questionnaires and interviews have varying psychometric properties in different settings and populations (Goldberg, Oldehinkel, & Ormel, 1998).

One advantage in studying prisoners is the availability of participants. This is seen in the high inclusion rates of many prison studies (Andersen, 2004). One reason for the high inclusion rates may be the opportunity for contact with 'neutral persons' and to report personal problems. Also, for offenders to participate in a study may be a relief from the monotony of prison life.

2.4 Special characteristics of female prisoners

2.4.1 The population of female prisoners

More than a half million women and girls are incarcerated in penal institutions throughout the world, representing 2–9% of the total prison population (Walmsley, 2006). About a third of female prisoners are in the United States (183,400) and similarly large numbers are in China (71,280 plus women and girls in pre-trial detention or 'administrative detention'), the Russian Federation (55,400) and Thailand (28,450). The next highest numbers are in India (13,350), Ukraine (11,830), Brazil (11,000), Vietnam (10,990), Mexico (10,070) and the Philippines (6,860) (Walmsley, 2006). In Europe there are about 100,000 women in prison every day (World Health Organization, Regional Office for Europe, 2009), and the median level of women

within the total prison population in Europe is 4.4% (Walmsley, 2006). In Oceania, the median level is almost same (4.3%). In African countries, women and girls constitute a smaller percentage of the total (the median is 2.7%) whereas in the Americas and Asia the median level is higher (5.3% and 5.4% respectively). In Finland, too, women are a small but growing minority of prisoners (from 3.5% in year 1993 to 7.5% in year 2011) (Rikosseuraamuslaitos, 2011; Rikosseuraamusvirasto, 2008). The daily average number of female prisoners in 2010 was 246 (Blomster et al., 2011).

2.4.2 Socio-demographic and criminological characteristics of female prisoners

Women in prison frequently come from deprived backgrounds, and many have suffered physical and sexual abuse, alcohol and drug addiction and inadequate health care before imprisonment (Langan & Pelissier, 2001; Penal Reform International, 2007; World Health Organization, Regional Office for Europe, 2009). In an earlier Finnish prison study, women had lower social status than men, occupational performance was more frequently poor in women than in men and the proportion of those on sick leave or receiving a disability pension was higher among women than among men. Also, a disadvantaged childhood was found more often among women than among men (Joukamaa, 1991).

Most imprisoned women are of childbearing age and have children (Lo, 2004; World Health Organization, Regional Office for Europe, 2009). They need gender-specific health care with attention to reproductive health, gynaecology and obstetrics. Prison studies elsewhere have shown that compared to similar women in general population, pregnant prisoners are more likely to have many risk factors associated with poor perinatal outcome (Knight & Plugge, 2005). However, the results of this systematic review suggest that the imprisonment of a pregnant woman may have a beneficial effect on pregnancy outcomes such as reducing the risk of stillbirth and low birth weight. It has been estimated that about 10,000 children in Europe younger than two years are affected by their mother's imprisonment (World Health Organization, Regional Office for Europe, 2009). The number of children affected under 18 years is much higher: hundreds of thousands. Many imprisoned mothers are the primary or sole carer for their children (World Health Organization, Regional Office for Europe, 2009). Women bear great responsibility in their families, especially their children. Female prisoners on average have more children than males (Lo, 2004). Children may have a positive effect on crime recidivism among women. In a U.S. study, the number of children and relationships were more important in lengthening the time in the community for women than men (Benda, 2005). A Finnish study of children in prison found that in the period 2000–2006 there were 100 children in prison (Enroos & Pösö, 2008). Both allowing children to live in prison and separating children from their

mothers pose difficult problems and dilemmas (World Health Organization, Regional Office for Europe, 2009).

In Finland, men re-offend more commonly than women (Blomster et al., 2011). In 2010, 49% of female and 32% of all Finnish prisoners were imprisoned for the first time and 33% of female and 54% of all prisoners were imprisoned for the third time or more. The number of foreign female prisoners is low in Finland (in 2006, approx. 4–5%). In 2010, the predicted time in prison among sentenced women was under 12 months in 37% (among all prisoners 34%), 1<2 years in 29% (24%), 2<4 years in 16% (19%), 4<8 years in 14% (14%) and over 8 years in 6% (8%) (Blomster et al., 2011). The proportion of prisoners serving long sentences has increased in the 21st century because of the increase in life sentence prisoners (Blomster et al., 2011).

Finnish female prisoners are most commonly sentenced to imprisonment for crimes of violence (Putkonen, 2003; Rikosseuraamuslaitos, 2011). This is exceptional among the European countries, where drug and property offences are more common among women (Quaker Council for European Affairs, 2007). The proportion of violent crimes has also increased among men in Finland (Blomster et al., 2011). Among Finnish women, the main offence in 2010 was violence in 51% (among all prisoners 43%), property in 24% (24%), drugs in 16% (16%), driving under the influence in 5% (12%) and other in 5% (7%) (Blomster et al., 2011). Putkonen researched homicidal women in Finland (Putkonen, 2003; 2011; Putkonen & Collander, 2006; Putkonen, Collander, Honkasalo, & Lönnqvist, 2001a). Female perpetrated violence was usually directed against close persons and common features among violent Finnish females and males included underprivileged life and substance abuse. The increase of female homicide sentences is apparently most significantly influenced by the increased alcohol consumption among women (Putkonen, 2011).

2.5 Health of prisoners

According to numerous studies prisoners often have multiple chronic health problems (e.g. Australian Institute of Health and Welfare, 2011; Baillargeon, Black, Pulvino, & Dunn, 2002; Butler, Kariminia, Levy, & Murphy, 2004; Fazel & Baillargeon, 2011; Wilper et al., 2009; World Health Organization, Regional Office for Europe, 2009) and chronic conditions seem to be more prevalent among female prisoners (World Health Organization, Regional Office for Europe, 2009). Mental disorders, infectious diseases and illicit drug use are especially common among female inmates and the comorbidity is considerable (Fazel & Baillargeon, 2011; World Health Organization, Regional Office for Europe, 2009). Most of the evidence on the health of the prisoners comes from high-income nations (U.S.A., U.K., Europe, Australia) (Andersen, 2004). Moreover, the race and ethnic differences in offenders between countries, even within Western Europe but especially regarding studies in the U.S.A., affect the results of

health studies. Over 90% of the prison population is men, so there are relatively few prison studies on health related problems focusing on gender.

2.5.1 Health in general

Most chronic disorders are more common among prisoners than in general population (Fazel & Baillargeon, 2011). The terms chronic condition/health problems in the studies may include not only physical and/or infectious diseases but also mental disorders, thus making comparison of the results difficult. The most important international studies and systematic reviews of prisoners' health are collected in Table 1. The studies mostly concern men, but one Irish study is solely on women (Carmody & McEvoy, 1996). Most of them are based on interviews and questionnaires, and two are based on register data.

In an Irish study among 100 women in Dublin, asthma, chest problems and bronchitis were the main ailments named and female prisoners were more likely to abuse drugs and alcohol than the general population (Carmody & McEvoy, 1996). In an later Irish prisoner study, 29% of females and 20% of males reported a long-standing illness or disability that limited their activity (Hannon, Kelleher, & Friel, 2000). Musculoskeletal and respiratory illnesses were the most frequent long-standing conditions. In the same study (please see Table 1.), the four most common medical conditions in the previous 12 months were depression (42% of females and 22% of males), anxiety (11% and 14%), skin diseases (15% and 12%) and asthma (36% and 10%).

In Australia, two health surveys in the New South Wales Correctional System have been carried out (Butler, 1997; Butler et al., 2004). In the earlier study, 39% of women and 30% of men had long-term illness or disability (Butler, 1997). The most commonly reported long-term conditions were musculoskeletal diseases (e.g. back problems, arthritis). In the later study, Butler et al. found that 81% of women and 65% of men had suffered at least one chronic health condition (Butler et al., 2004). The most common conditions were back problems, poor eyesight, arthritis, high blood pressure and asthma. The Australian Institute of Health and Welfare has published two reports of the health of Australian prison entrants in 2009 and 2010 (Australian Institute of Health and Welfare, 2010; 2011). The health indicators presented in these reports were developed to monitor the health of prisoners, and to inform and evaluate the planning, delivery and quality of prisoner health services. In the report 2011, 26% of prisoners had a current chronic medical condition (asthma 12%, arthritis 8%, cardiovascular disease 5%, diabetes 4%, cancer less than 1%). Please see Table 1.

In the U.S. studies, the samples usually consist of thousands to hundreds of thousands of prisoners. Baillargeon et al. (2002) examined the prevalence of major acute and chronic conditions among Texas prison inmates. Infectious diseases (37% of women, 29% of men) were the most prevalent disease category. This was followed by diseases of the musculoskeletal system and connective tissue (15% of women and men),

Table 1. International studies on the health of prisoners.

Study, year of publishing, country	Sample size, gender	Race, age	Prison, character of prisoners	Methods	Overall results	Somatic and infectious diseases	Mental disorders
Carmody and McEvoy, 1996 Ireland	Ireland 100 women	17 years or more, mean age 27.6 years	Remand and sentenced prisoners in Dublin	Interviews by general practitioners	Respiratory illnesses were main health problem (68% of women) Female prisoners more likely abused drugs and alcohol than the general population	24% HIV positive 29% HBV positive 61% HCV positive	Heroin was the commonest drug One in four women had an alcohol problem Almost one in two women had had psychiatric treatment in the past
Butler, 1997 Australia	789 inmates, 657 men 132 women	18 years or more	New South Wales Correctional System	Interviews, questionnaires, laboratory tests, dental assessment	30% of men and 39% of women long-term illness or disability, most commonly musculoskeletal	33% of men and 66% of women HCV positive 2 of men and 2 of women HIV positive	Half of male and female harmful alcohol drinking 64% of males and 73% of females illegal drug use at some time 16% of females and 7% of males depression dg by a doctor 2% of females and 3% of males schizophrenia dg
Hannon et al., 2000 Ireland	777 prisoners, 59 of them women	15 years or more mean age 27 years	Semi open and open prisons	Questionnaires	22 % of men and 29% of women had chronic illness or disability 29% of men and 74% of women had regular prescribed medication	Most common were skin diseases in 15% of females and 12% of males, asthma in 36% of females and 10% of males	22% of men, 42% of women had depression 14% of men, 11% of women had anxiety 72% of men and 83% of women had lifetime drug utilisation 25% of males and 39% of females daily alcohol drinking

Baillargeon et al., 2002 Texas, the USA	170,215 inmates; 155,949 men 14,268 women	Black 44% White 30% Hispanic 26% 18 years or more	Texas Department of Criminal Justice	ICD-10 diagnoses from medical records	37% of women and 29% of men had infectious diseases, 15% of women and men musculoskeletal, 12% of women and 14% of men circulatory, 20% of women and 10% of men mental disorders, 8% of women and 6% of men respiratory diseases	Most prevalent diseases: 20% tuberculosis infection (not active pulmonary disease) 10% hypertension 5% asthma 5% low back pain 5% viral hepatitis HIV/AIDS 2.4% of women and 1.5% of men	10% of women and 3% of men had affective disorders 2.7% of women and 1.9% of men had schizophrenic disease
Butler et al., 2004 Australia	914 inmates 747 men 167 women	aboriginal 30% of men and 17% of women 18 years or more	New South Wales prisons	Interviews	81% of women and 65% of men at least one chronic health condition, most common were back problems, poor eyesight, arthritis, high blood pressure, asthma	Psychiatric medication more commonly among women than men (25% vs. 13%). Methadon maintenance more common among women than men (39% vs. 13%).	
Friestad and Hansen, 2004 Norway	260 225 men 35 women	18 years or more	37 prisons	Interviews	Half had one or more chronic medical condition	1/3 had alcohol problems 6 out of 10 had illicit drug abuse, women more than men	
Wilper et al., 2009 the USA	6,982 jail inmates, 1,4499 state inmates, 3,686 federal inmates 88% – 93% – 93% men respectively	non-hispanic white 26% – 35% – 36% non-hispanic black 43% – 41% – 40% Hispanic 25% – 18% – 18% other 6% – 6% – 6% 13 years or more	Local jail, state and federal inmates	Questionnaires	39% of jail, 43% of state and 39% of federal inmates had a chronic medical condition	25% of jail, 26% of state and 15% of federal inmates had any mental health condition	
Binswanger et al., 2010 the USA	6,982 jail inmates 4,994 men 1,988 women	40% non-hispanic black 36% non-hispanic white 18.5% hispanic mean age of males 31.7, of females 33.4 years	Local jails	Questionnaire of self- reported medical and psychiatric conditions to investigate gender differences	Women had significantly higher prevalence of all medical and psychiatric conditions and drug dependence, but women had lower alcohol dependence	17% of men and 22% of women had hypertension, 14% (24%) asthma, 13% (20%) arthritis, 9% (11%) heart problem, 3% (7%) diabetes, 1% (8%) cancer, 5% (10%) hepatitis, 1% (2%) cirrhosis	22% of men and 44% of women had any psychiatric disorder 53% (59%) drug abuse or dependence, 48% (37%) alcohol abuse or dependence

Harzke et al., 2010 Texas, the USA	234,031 male 210,501 female 23,530	36.7% African American 33.8% non-Hispanic white 29.5% Hispanic	Texas Department of Criminal Justice	Data was extracted from electronic medical records; medical evaluations, medical diagnoses (ICD-9-CM)	24.6% of men and 23.8% of women had at least one of the selected chronic medical conditions Age-standardized estimates did not exceed those of the US general population but a large number of inmates had one or more of conditions	19.2% of men and 15.4% of women had hypertension 5.0% (8.8%) asthma 4.2% (3.6%) diabetes 1.9% (0.83%) ischemic heart disease 0.99% (0.69%) COPD 0.24% (0.11%) cerebrovascular disease	
Australian Institute of Health and Welfare 2011 Australia	610 prison entrants 86% were men	43% Indigenous median age 31 years	Public and private prisons	Interviews	26% had a current chronic condition	asthma 12%, arthritis 8%, cardiovascular disease 5%, diabetes 4%, cancer less than 1% 35% HCVAb positive, 21 % HBVAb positive, less than 1% HIV positive	31% ever had a mental illness 16% currently taking medication for mental related condition 58% harmful alcohol drinking 66% illicit use of drugs

Reviews							
Fazel and Danesh, 2002	62 surveys from 12 countries 22790 prisoners 81% men 26% violent offenders	Mean age 29 years	A systematic review of mental disorders			Men: 3.7% psychotic illnesses, 10% major depression, 65% a personality disorder, incl. 47% with antisocial personality Women: 4.0% psychotic illnesses, 12% major depression, 42% a personality disorder, incl. 21% with antisocial personality	
Fazel et al., 2006	13 studies 7563 prisoners 57% men 43% women 14.5% violent offenders	Average age 30.4 years (from 10 studies)	A systematic review of substance abuse and dependence	The prevalence of substance abuse and dependence is higher in prisoners than the general population, particularly for women with drug problems		Prevalence estimates of alcohol abuse and dependence ranged from 18 to 30% in males and 10 to 24% in females Prevalence estimates of drug abuse and dependence ranged from 10 to 48% of males and 30 to 60% of females	
Vescio et al., 2008	30 studies (24 cross-sectional, 6 longitudinal) 31358 inmates		A meta-analysis of correlates of hepatitis C virus positivity			HCVAb found in 30–40% (range 2–58%). IDU was 24 times more likely than non-IDU to be HCV positive. The OR of being HCV positive was 3 times higher for inmates exposed to tattooing than those not exposed. The OR among women was 1.44 compared with men.	

<p>Fazel and Baillargeon 2011 refers partly to previous reviews; Fazel 2002, Vescio 2008</p>				<p>a review of some major physical and psychiatric diseases and risk factors</p>	<p>Most chronic disorders more common in prisoners than in general population</p>	<p>HIV infection: high-income countries 0–7.5%, the USA 1.5% 2007–08, of low-income/middle-income countries in 20 out of 75 countries the prevalence exceeded 10%. Hepatitis B infection: common with wide variations between countries, estimates of chronic hepatitis B infection in US prisoners are 1.0–3.7%. Hepatitis C: see Vescio et al. 2008. Tuberculosis: in 13 western Europe countries median tbc rate in 2002 was 90 cases/100 000 prisoners, in low-income countries tbc rate ranged from 17808 to 363 cases/100 000.</p>	<p>see Fazel and Danesh 2002</p>
<p>Fazel and Seewald, 2012</p>	<p>109 studies from 24 countries 33588 prisoners</p>			<p>a systematic review and meta-regression analysis of severe mental illness</p>			<p>Psychosis 3.6% in males, 3.9% in females, in low-middle-income countries 5.5% Major depression 10.2% in males, 14.1% in females The prevalence of these disorders did not be increasing over time, apart depression in the USA</p>

diseases of the circulatory system (12% of women, 14% of men) and mental disorders (20% of women, 10% of men). Another survey of U.S. prisoners showed that 39% to 43% of the inmates had a chronic medical condition (Wilper et al., 2009). This study consisted of inmates in local jails and state and federal prisons. The age-standardized prevalences of diabetes, hypertension, myocardial infarction (except in jails) and asthma were higher than for the general population. Binswanger et al. (2010) analysed data from a nationally representative survey of 6,982 US jail inmates. They investigated whether there were gender differences in chronic medical, psychiatric, and substance dependence disorders. Chronic medical disorders included cancer, hypertension, diabetes, arthritis, asthma, hepatitis and liver cirrhosis. Psychiatric disorders included depressive, bipolar, psychotic, posttraumatic stress, anxiety and personality disorders. Women had a significantly higher prevalence of all medical and psychiatric conditions and drug dependence but a lower prevalence of alcohol dependence. Some medical condition was found in 40% of men and 57% of women. Some psychiatric disorder was diagnosed in 22% of men and 44% of women, drug abuse/dependence in 53% of men and 59% of women, alcohol abuse/dependence in 48% of men and 37% of women. The study by Harzke et al. (2010) was based on the medical records of 234,031 inmates in the Texas Department of Criminal Justice. One fourth of inmates had one or more chronic conditions. In contrast to Wilper et al. (2009), it was found that age-standardized estimates of selected chronic medical conditions did not exceed those of the U.S. general population. The conditions studied were hypertension, asthma, diabetes, ischaemic heart disease, chronic obstructive pulmonary disease and cerebrovascular disease.

There is one interview study from Norway with 260 inmates (Friestad & Skog Hansen, 2004). Half of the inmates had one or more chronic medical conditions. To the best of the present author's knowledge in the Scandinavian countries, comprehensive prison health studies have been conducted only in Finland.

2.5.2 Mental health and substance abuse

Worldwide, mental disorders are more common in prisoners than in general population (Fazel & Danesh, 2002). According to a systematic review of 62 surveys and 23,000 prisoners (Fazel & Danesh, 2002), 4% of women and 4% of men had psychotic illnesses, 12% of women and 10% of men major depression and 42% of women and 65% of men a personality disorder, including 21% of women and 47% of men with antisocial personality disorder (please see Table 1.). Recently, Fazel and Seewald (2012) published a new systematic review and metaregression analysis of severe mental illness in 33,588 prisoners worldwide. It included 109 studies from 24 countries. They found a pooled prevalence of psychosis of 4% among female prisoners and 4% among male prisoners. There was high level of heterogeneity, some of which was explained by studies in low-middle-income countries reporting higher prevalences of psychosis (6%). The pooled

prevalence of major depression was 14% among female prisoners and 10% among male prisoners. The prevalence of these disorders did not appear to be increasing over time, apart from depression in the U.S.A.

In other health studies in Table 1., the results were mainly based on self-reported general psychiatric conditions. In the U.S. studies, 15–26% of inmates had some mental health condition (Wilper et al., 2009) and 22% of male and 44% of female jail inmates (Binswanger et al., 2010). In the AIHW 2011 report, 31% of entrants had had a mental illness in their lifetime (Australian Institute of Health and Welfare, 2011). In the other studies in Table 1, the results of specified psychiatric diseases differ somewhat from the results of systematic reviews (Fazel & Danesh, 2002; Fazel & Seewald, 2012).

In a systematic review of 13 studies with a total of 7,563 prisoners (Fazel, Bains, & Doll, 2006), the prevalence of alcohol abuse and dependence in female prisoners ranged from 10 to 24% and in males from 18 to 30%. Drug abuse and dependence varied in females from 30 to 60% and in males 10 to 48%. Among jail inmates in the U.S., the alcohol abuse and dependence figures are higher (Binswanger et al., 2010). In the Australian studies (Australian Institute of Health and Welfare, 2011), the figures of harmful alcohol drinking and illegal drug use are somewhat higher than in the systematic review. Also, in the Irish study by Hannon et al. (2000), the alcohol drinking of females and the lifetime drug taking in both genders were higher than in the systematic review. In the Norwegian study, one third had alcohol problems and six out of ten engaged in illicit drug taking (Friestad & Skog Hansen, 2004).

2.5.3 Hepatitis and HIV infections

Vescio et al. (2008) conducted a meta-analysis of the correlates of hepatitis C virus (HCV) positivity with 30 studies and 31,358 inmates. In most studies the prevalence of HCV seropositivity was approximately 30–40% (range 2–58%). Most of the subjects were men. The most important source of the extreme heterogeneity among studies was the diverse proportion of intravenous drug use (IDU). In different studies, the prevalence of HCV among female inmates has varied from 11% to 67% (Babudieri et al., 2005; Fox et al., 2005; Solomon, Flynn, Muck, & Vertefeuille, 2004).

Female prisoners in the European Union are more likely to inject drugs than are male prisoners (European Monitoring Centre for Drugs and Drug Addiction, 2004). The meta-analysis by Vescio et al. (2008) showed that female gender was associated with HCV positivity (odds ratio 1.43 (95% CI 1.06–1.92) compared with men), which is in contrast to observations made from general population where HCV prevalence is usually higher among men (Vescio et al., 2008).

Epidemiological studies of prison populations in most countries have reported rates of HIV infection that exceed those in general population (Dolan et al., 2007; UNAIDS, 2009). A review of HIV prevalence in prisons in low-income and middle-

income countries reported that, of the 75 countries for which data was available, the prevalence of HIV exceeded 10% in the prisons of 20 countries (Dolan et al., 2007). Female prisoners generally had higher HIV infection rates than males. HIV prevalence in high-income countries also varies greatly. The US Government began collecting data on the number of HIV-infected inmates in prisons and jails in 1991 (Fazel & Baillargeon, 2011). The overall prevalence ranged from 2.5% in 1992 to 1.5% in 2007–08 (Bureau of Justice Statistics. Publications & Products, 2012). In other high-income countries, prevalence of HIV in prisoners ranges from 7.5% in Italy (Babudieri et al., 2005) to 0% in Denmark (Christensen et al., 2000). In Australia, less than 1% of prison entrants were found to be HIV positive (Australian Institute of Health and Welfare, 2011).

Present and past infection with hepatitis B virus is common in prison populations, with wide variations between countries and within countries (Fazel & Baillargeon, 2011; Harzke, Goodman, Mullen, & Baillargeon, 2009; Weinbaum, Sabin, & Santibanez, 2005). Estimates of the prevalence of chronic infection with hepatitis B virus in US prisoners are in the range 1.0–3.7%, compared with about 0.4–0.5% for general population (Weinbaum et al., 2005). The prevalence of hepatitis B virus core antibodies (HBcAb, indicating present or past infection) has varied 10–50% (Allwright et al., 2000; Babudieri et al., 2005; Crofts et al., 1995; Ford et al., 1995; Long et al., 2000; Weild et al., 2000).

Intravenous drug use constitutes a high risk for acquiring viral hepatitis and HIV infections (Allwright et al., 2000; Babudieri et al., 2005; Hutchinson et al., 2006; Weild et al., 2000). According to a meta-analysis by Vescio et al. (2008) in many prisons the proportion of inmates reporting a history of injected drug use exceeds 20%. The risk of testing positive for HCV was three times higher for inmates with tattoos than for those without tattoos. In a survey of 1600 prisoners in Quebec prisons, 45% of women and 26% of men reported having had sex before incarceration with a partner who injected drugs and in most cases the sex was unprotected (Poulin et al., 2007). The use of non-sterile injecting equipment (e.g. syringe and needle sharing) seems to be the most important independent risk factor for transmission within prison of both HIV and viral hepatitis (Jürgens, Bail, & Verster, 2009).

2.5.4 Use of health care services and medication

Few studies have been conducted among offenders concerning their use of health care services before imprisonment. The studies deal mainly with mental health care services and very few with physical diseases.

In Australia in 2010, 76% of prison entrants had consulted a medical professional during the preceding 12 months (Australian Institute of Health and Welfare, 2011). Hiller et al. (2005) studied the use of medical and preventive health care services among

male inmates in Kentucky prisons. They found that the inmates with substance abuse and mental health problems reported significantly greater use of the accident and emergency services and more hospital stays both throughout their lifetime and in the year prior to their incarceration than did those without these problems.

There are some studies of mental health care service use among female prisoners. In an Irish study almost one in two women had had psychiatric treatment (Carmody & McEvoy, 1996). Among women entering a North Carolina prison, 54% had received psychiatric or substance abuse services in their lifetime and the rates of service use were higher than for the women in general population (Jordan et al., 2002). In a U.S. study, 13% of female jail inmates had previous psychiatric hospitalisation, 14% previous outpatient treatment and 30% had been or were waiting for substance abuse treatment (Drapalski, Youman, Stuewig, & Tangney, 2009).

There are some contradictory findings, especially by gender, of receiving mental health treatment prior to imprisonment. In a U.S. study, only few county jail inmates reported mental health treatment prior to incarceration and the only gender difference was that men had received substance abuse treatment more commonly (Drapalski et al., 2009). Among American incarcerated women, urban women reported more preincarceration use of mental health and substance abuse services than did rural prisoners (Staton-Tindall, Duvall, Leukefeld, & Oser, 2007). According to a study in the UK, the receipt of mental health services before imprisonment was demographically most strongly associated with being older, white and female (Farrell et al., 2006). This study concluded that the majority of mental health needs of these prisoners were not attended to prior to imprisonment.

In a study on Finnish prisoner in 1985 (Joukamaa, 1991), 79% of women and 90% of men reported having used some outpatient service because of somatic disease and 73% of women and 52% of men psychiatric outpatient services. For somatic reasons had been hospitalised 65% of women and 74% of men. Psychiatric in-patient hospital care had been provided to 30% of women and 23% of men. In the same study, some need for treatment was found in 85% of female and 76% of male prisoners. The use of psychiatric health care services and need for treatment was more common than in general population.

An Irish study on prisoners reported gender difference in taking prescription medicines and high medication among female prisoners; 74% of the females and 29% of the males reported taking regular prescription medication (Hannon et al., 2000). In this study, the female preponderance was seen in the use of medicines for mental disorders and insomnia. Other studies, mainly among men, have reported lower figures for medication. In a US survey of prisoners more than one in five inmates were taking prescription medication (Wilper et al., 2009). In Australia, 40% of all prisoners were taking prescribed medication and 16% of prison entrants were on psychotropic medication (Australian Institute of Health and Welfare, 2011). An earlier study

from Australia on New South Wales prisons showed that psychiatric medication was more common among women than men (25% vs. 13%), and methadone maintenance treatment was more common among women than men (39% vs. 13%) (Butler et al., 2004).

2.5.5 Abuse in childhood

The assessments of the rates of childhood physical abuse (CPA) and childhood sexual abuse (CSA) are influenced by definitions of childhood abuse, research methods and sample characteristics (Pereda, Guilera, Forns, & Gomez-Benito, 2009). Pereda et al. (2009) recently published a review including 38 studies from 21 countries. The prevalence of CSA ranged from 0 to 53% for women and 0 to 60% for men. Different definitions of what constitutes CSA have been used (age difference between the perpetrator and victim, the age used to define childhood or the type of sexual abuse). The review emphasized that such variability influences the estimates of CSA prevalence in any given sample. Moreover, methodological differences influence the prevalence, especially as regards the methods of data collection (face-to-face interviews, self-administered questionnaires). It has also been noted that the use of broad questions is associated with lower prevalence rates of sexual abuse than more behaviourally specific questions (Fricker, Smith, Davis, & Hanson, 2003).

In a Finnish study among 4,561 men and 8,361 women (twins and their siblings), the prevalence of CSA experiences varied between 0.7 and 4.6% for men and 2.4 and 9.3% for women depending on the item in the Childhood Trauma Questionnaire Short Form (touching, threatening, doing/watching, molested, sexually abused) (Laaksonen et al., 2011). The prevalence of the item "sexually abused" was 1.3% for men and 5.3% for women. The younger cohorts reported less CSA than older cohorts suggesting that there was a real decline in the prevalence of CSA.

Among Finnish 15 to 16 year old adolescents (2,856 girls and 2,906 boys), 2% of girls and 1% of boys had suffered severe physical parental violence and 10% of girls and 4% of boys mild physical violence during the preceding 12 months (Peltonen, Ellonen, Larsen, & Helweg-Larsen, 2010). The severe forms of parental violence were associated with severe psychological problems. Another Finnish study among 1,393 pupils (median age 15 year) reported that 9% had experienced severe parental violence and 55% mild parental violence during their childhood (Lepistö, Luukkaala, & Paavilainen, 2011).

Only few studies of this kind have dealt with prisoners. In prison studies conducted in the U.S.A., the rates of CPA among female offenders have varied from 39% to 70% and the rates of CSA from 34% to 59%, the highest figures being among offenders in maximum security prisons (Clements-Nolle, Wolden, & Bargmann-Losche, 2009; Dembo, Schmeidler, & Childs, 2007; McDaniels-Wilson & Belknap, 2008; Raj et al., 2008; Warren et al., 2002).

Only few studies on prisoners have addressed the connections between childhood maltreatment and substance abuse and mental health problems. Carlson, Shafer, and Duffee (2010) studied male and female inmate parents in Arizona (838 men, 1,441 women). The exposure to childhood and adult traumatic events, especially child abuse, was related to self-reported alcohol and drug problems for both males and females. The mother inmates reported significantly more post-release service needs than fathers. In a study including 107 male and 29 female juveniles in Florida, female homicide offenders had higher rates of reported childhood abuse, more serious substance abuse and mental health problems than males (Roe-Sepowitz, 2009). Messina et al. studied drug-dependent prisoners in California (Messina, Grella, Burdon, & Prendergast, 2007). Women prisoners had suffered greater exposure to childhood adverse events than men. The results also showed that the impact of childhood adverse events on traumatic distress was strong and cumulative in both men and women. Mullings, Hartley, and Marquart (2004) studied newly incarcerated female prisoners within the Texas prison system in the period 1998–1999. Alcohol dependent women were more likely to have grown up in disorganized family situations, including e.g. childhood neglect, CPA and CSA. Another study on Texas prisons revealed childhood maltreatment to be more strongly associated with adult depression and substance dependence among female than among male prisoners (McClellan, Farabee, & Crouch, 1997). In these studies, too, methodological and definitional inconsistencies across studies made it difficult to estimate the rates of CSA and CPA and their connections to later life events.

2.5.6 Mortality of prisoners

In addition to many health problems, mortality among prisoners is higher than in general population (Fazel & Benning, 2006; Joukamaa, 1998; Putkonen, Komulainen, Virkkunen, & Lonnqvist, 2001b; Sailas et al., 2005).

A retrospective cohort study of 85,203 adults imprisoned in New South Wales, Australia was carried out by Kariminia et al. (2007). The median overall follow-up time of the cohort was 7.7 years. The mortality of male and female offenders was far greater than expected for all major causes, especially deaths caused by drug overdose. The vast majority of deaths occurred after release from custody. All-cause standardized mortality ratio (SMR) was 3.7 in men and 7.8 in women. SMRs were substantially raised for deaths due to mental and behavioural disorders and drug-related deaths. The SMR for death by homicide was 10.2 in men and 26.3 in women.

Fazel and Benning (2006) studied natural deaths in male prisoners in English and Welsh prisons over a 20-year period. They found increased mortality ratios for respiratory pneumonia and other infections.

Sailas et al. (2005) found that the mortality rate among young Finnish offenders sentenced to prison was high: for young male prisoners SMR was 7.4 (95% confidence

interval 6.7–8.1). The causes of death were mostly unnatural and often violent. The high mortality in this group was associated with substance abuse and psychiatric disorders. In a follow-up study (Putkonen et al., 2001b), Finnish female homicide offenders have been found to have an over 200-fold risk of unnatural death, rising to over 400-fold for suicide. The SMR for natural deaths was 6.7, for unnatural deaths 225.7 and for suicides 424.8. In a seven-year follow-up study of the WATTU Project, the mortality of released Finnish male prisoners was four times as great as in general population (Joukamaa, 1998). During the follow-up, 13.2% of the sample died: 5.2% due to natural causes, 2.0% due to suicide and 1.1% due to homicide. Cardiovascular diseases were the most common cause of natural deaths and acute intoxication for accidental deaths. The risk for suicide was almost three-fold that of the Finnish male population.

2.6 Earlier studies on Finnish prison health

The first scientific basic study on Finnish prisoners' state of health, need for treatment and capacity for work, was carried out in the Prison Service in 1985 (the WATTU Project) (Joukamaa, 1991). This study consisted of 870 men and 33 women. The sample was representative of the Finnish prison population at that time. A cross-sectional study with a smaller prisoner sample (252 men, 40 women) was subsequently carried out in 1992 (Joukamaa, 1994). In 2002 as a part of the report entitled "Vankien terveydenhuollon kehittäminen", the health of prisoners was assessed on the basis of the medical records (Rikosseuraamusvirasto, 2002). This assessment included one third of male offenders and all female offenders.

In the 1985 study, more than half of prisoners had mental problems. The high number of mental disorders was due to alcoholism (43%) and personality disorders (18%). Neurotic disorders were found significantly more commonly among women than among men. Psychiatric in-patient hospital care had been provided for 30% of women and 23% of men. Diagnoses of narcomania were set for only 6% of participants. Regular prescription medicine was taken by 36% of women and by 22% of men on entering prison. The prevalence of somatic illnesses as a whole was higher among prisoners than among general population. Of the subjects one third was assessed to definitely need at least some kind of treatment and two fifths possibly.

The study in 1992 showed that mental disorders and especially substance abuse problems had increased. According to the record study of 2002, increased drug abuse problems had caused significant health problems together with viral hepatitis and HIV infections. C hepatitis was found in 26% of prisoners, B hepatitis in 4% and HIV in 1%. Of the prisoners 46% had drug abuse problems and 39% alcohol dependence. According to the records, 14% of prisoners had at least some psychiatric diagnosis. Mental problems needing treatment during imprisonment were mentioned in the records of 39% of the subjects. The prevalence of injuries and their sequelae was 13%,

of respiratory diseases 8%, of musculoskeletal diseases 8%, of neurological diseases 6% and of cardiovascular diseases 4%. Medication was prescribed to 58% of inmates. No separate results for women and men were provided and the results were based solely on the entries in the prison medical records. In the report entitled “Vankien terveydenhuollon kehittäminen” it was concluded that serious health problems related to the marginalization of prisoners had mainly remained the responsibility of prison health services (Rikosseuraamusvirasto, 2002).

2.7 Work ability and employment

The concept of work ability is a complex cultural and situational entity, and health is one of the most important determinants of work ability (Gould, Ilmarinen, Järvisalo, & Koskinen, 2008). The more work ability, and its various dimensions has been studied, the more multidimensional and diverse its image has become. According to Gould et al. (2008) among a representative sample of adult Finnish people, well-educated persons, white-collar workers and those living with families were most satisfied with their work ability. In this study, work ability was defined on the basis of the subjects' own experience. In all groups work ability decreased as age increased. Among young adults, the highest risks of limited work ability were unemployment, lack of sufficient basic education and mental problems. Of the diseases investigated, depression and back disorders impaired the work ability of employed people most. In addition to work and health, expertise, skills and attitudes also determined work ability. The work ability of the Finnish population had improved over a period of two decades. The simultaneous change in the population's educational level explained the decrease in work ability limitations among women and for the most part among men. The work ability of the unemployed, and especially the long-term unemployed, was poorer than that of the working population. Economic difficulties and a low level of education were related to problems with work ability. Work ability was also associated with a person's immediate social network and with the family. The work ability of people with families was better than that of others. According to this study, problematic groups from the perspective of work ability included people with a low level of education and the unemployed, men living alone, widows and the oldest group of employed women (Gould et al., 2008).

Prisoners in Finland are young but they have many of the typical characteristics of persons with limited work ability, especially female prisoners. However, there are few studies on the work ability of prisoners and the work ability of Finnish female offenders has not so far been appropriately studied. An Australian study in 2010 found that 19% of female and 12% of male prison entrants were unable to work due to disability, age or health condition. Of females, 7% and of males 31% were working full-time, whereas 59% of females and 41% of males were unemployed (Australian Institute of Health and Welfare, 2011). In an Irish study on prisoners of 1999, 16% of women and 26% of

men were employed, and 60% of women and 51% of men were unemployed or seeking work for the first time (Hannon et al., 2000). Those unable to work due to permanent sickness or disability were 2% of women and 4% of men.

According to the WATTU Project of 1985, less than half of the Finnish prisoners were able to work: 18% of women and 15% of men were unable to work and moreover, 48% of women and 42% of men had impaired work ability (Joukamaa, 1991). Mental disorders were the main reason for disability. Of women, 18% and of men, 8% were disabled because of mental disorders and in addition, almost one half of both genders showed some impairment of work ability due to a mental disorder. In the same study, 33% of females and 34% of males were employed before imprisonment whereas 46% of females and 51% of males had been unemployed. Those on sick leave or disability pension amounted to 21% of women and 11% of men.

2.8 Conclusions based on the literature reviewed

The prison population is a very heterogeneous group across countries and also inside one country. The ethnicity, the correctional status of offenders, imprisonment policy and drug policy vary between countries. In many parts of the world, the number of prisoners is growing and at least in the U.S.A. and other western countries, one important reason has been drug-related crimes. Over 90% of prisoners are men, so most of the studies presented, including health studies, are confined to males. Most of the health studies come from the U.S.A., which has the largest number of offenders. Almost all the research data comes from high-income countries.

The health studies have been conducted on very different prisoner samples using different methods. Most chronic disorders are more common in prisoners than in the general population. This is quite relevant concerning infectious diseases such as HIV and virus hepatitis, which are closely connected to intravenous drug use. Many prisoners also have other chronic medical conditions, although the numbers vary a lot across different studies: from one fourth to four fifths of prisoners. Musculoskeletal and respiratory diseases are common. These are also common in general populations. There have been contradictory findings in U.S. studies concerning some chronic disorders such as hypertension, asthma, diabetes, ischaemic heart disease and chronic obstructive pulmonary disease. One recent study showed that age-standardized estimates did not exceed those of the US general population. However, it seems that prisoners frequently have several chronic medical conditions simultaneously.

Substance abuse problems, including alcohol consumption and illegal drug use, are very common among offenders. Alcohol abuse/dependence is more common among males than females, and drug abuse/dependence among females. High levels of psychiatric morbidity in prisoners have been documented in many countries over four decades. Women seem to have higher rates of most psychiatric disorders than men.

The studies in Finland and other countries have shown consistently that prisoners have higher mortality rates than general population, both in prison and after release.

Very little is known about prisoners' use of health care services. This also concerns work ability and employment of prisoners.

In Finland, there is no reliable information on female prisoners' state of health. The earlier Finnish prison health studies are old and have included only few women. The findings of studies in other countries cannot be generalized to Finnish prisoners because of the wide variations of prison populations.

3 AIMS OF THE STUDY

The aims of the present dissertation were as follows:

- 1) To ascertain the prevalence of viral hepatitis A, B, C and HIV infection and assess the markers of hepatic disease and the risk factors of these infections among female prisoners and compare the results with those of male prisoners (Study I)
- 2) To ascertain the frequency and gender differences in childhood physical and sexual abuse and the connections between childhood maltreatment and substance abuse and mental health problems among prisoners (Study II)
- 3) To assess lifetime somatic diseases, use of health services and the regular use of prescription medicines among female prisoners and to compare them with those of male prisoners (Study III)
- 4) To assess the work ability and employment history of female prisoners and their need for treatment and to compare the results with those of male prisoners (Study IV)

4 MATERIAL AND METHODS

4.1 Study design

The present study is a part of a national prison health survey 2006. Data collection was between October 2005 and October 2007; the majority of the data was obtained in 2006. The prisoner sample consisted of four subgroups: male prisoners (N=309), female prisoners (N=101), fine default prisoners (N=100), life sentence prisoners and prisoners held in preventive detention (N=100). In addition, one group was formed from offenders sentenced to community service. This dissertation deals with the female and male prisoner samples. At the beginning of data collection, participants underwent a routine admission health interview by prison nurses (for all incoming prisoners in Finland). After that, the subjects filled in four questionnaires (somatic health, psychological distress, quality of life, substance abuse). After that, experienced prison nurses interviewed them and took blood tests. The nurses also checked the questionnaires and added possibly missing information. Psychologists trained in the use of the method conducted the Structural Clinical Interview for DSM-IV Disorders (SCID). Physicians working for the Prison Health Services made medical examinations and a personal summary of subjects' diagnoses (The International Statistical Classification of Diseases 10th revision, ICD-10), work ability and treatment needs.

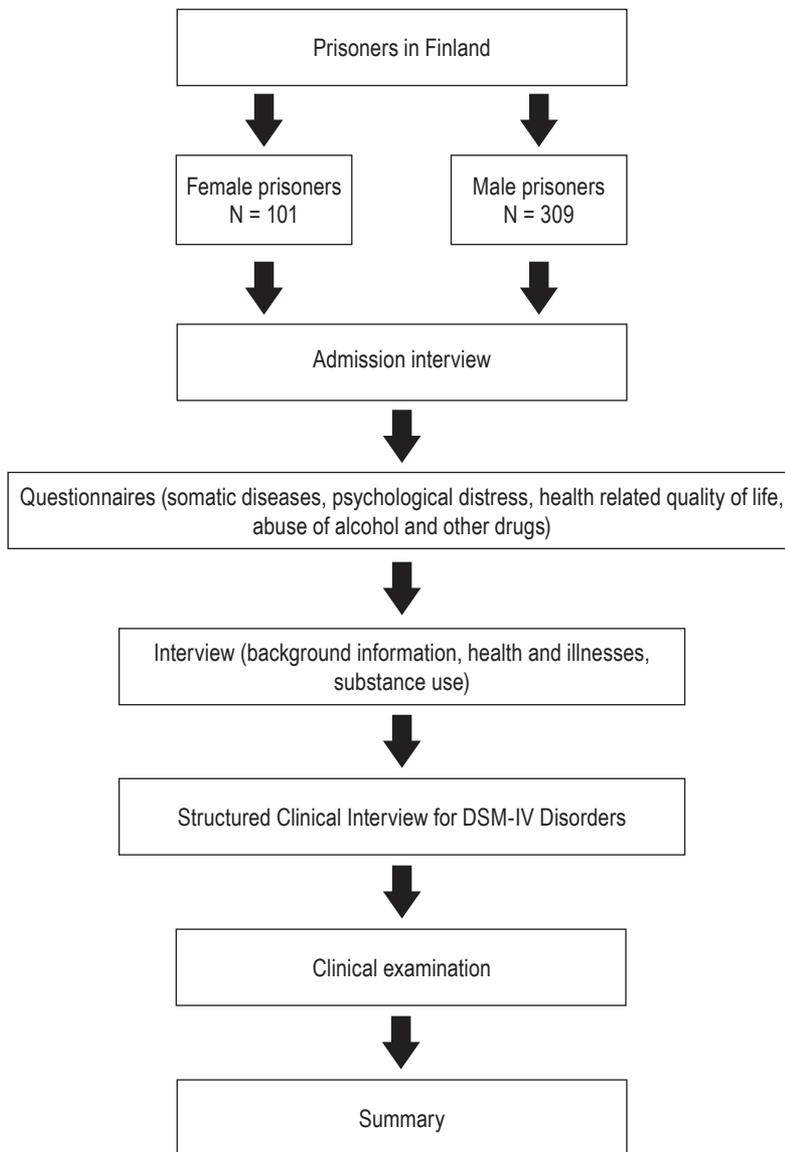


Figure 1. Flow chart

4.2 Subjects

The basic sample for Studies I–IV consisted of 101 Finnish female prisoners participating in the national prison health survey in 2006. It covered 41% of all Finnish female prisoners (Blomster et al., 2011). The share of foreign female prisoners is low in Finland (in 2006, approx. 4–5%) and they were excluded. The Finnish female prisoners

were incarcerated in Hämeenlinna prison and consisted of a sample (N=50) from successively incoming prisoners and a random sample (N=51) of inmates. The results were compared to those of male prisoners participating in the same survey. The male group consisted of a random sample of inmates from Helsinki and Riihimäki prisons plus a random sample of incoming prisoners from Turku prison, altogether 309 male prisoners. The admission policies and coverage areas were the same for women and men. It was confirmed in advance that the samples were representative of Finnish prisoners in general as regards socio-demographic background and criminal histories. In total 22 of the eligible female and 34 of the eligible male prisoners refused to participate. Due to the ethical regulations it was not possible to determine if the socio-demographic backgrounds of the non-responders differed from those of the participants. Moreover, 11 women and 17 men were unable to take part in data collection due to being released or transferred to another institution.

The sample of Study I included the prisoners who participated in the laboratory testing; 88 of the total of 101 women and 295–300 of the 309 men. According to the interviewing prison nurses and diaries, there was no systematic reason for refusing the laboratory testing. The refusers did not differ from the study sample as regards age, marital status or social class. Studies II–IV consisted of the basic sample of 101 women and 309 men.

4.3 Methods

4.3.1 Socio-demographic background and criminal variables

Information on age, marital status, children, social class and education was elicited in the interview conducted by prison nurses. Age was used as a continuous variable and also categorised into a four-class variable: 16–24, 25–34, 35–44, 45–69 (all subjects were under 70 years). In Study IV, age was also used as a two-class variable: 16–34, 35–69.

In Studies I, III and IV marital status was categorised as follows: married or cohabiting and other.

The participants were asked about their last profession or job. Social class was defined on a nine-level Finnish classification based on the social appreciation of professions (Rauhala, 1966) by connecting classes 1–5 (high), 6–7 (middle) and 8–9 (low). In Study IV, vocational education was divided into classes none, maximum two years' and over two years' education (based on the same categories as in the 1985 prison health study).

The information on number of previous prison sentences, cumulative years in prison and the present main offence was elicited from the statistics of Prison Administration of Finland. In Study II, the principal offence was categorised into classes: property,

violence, driving under the influence and other. In Study IV, the main offence was dichotomised into crimes of violence (which carry the longest sentences) and all other crimes.

4.3.2 Laboratory tests (Study I)

The laboratory tests were taken after the nurse interview and included alanine aminotransferase (S-ALT), gamma glutamyltransferase (S-GT), hepatitis B surface antigen (HBsAg) and antibodies to hepatitis A virus (HAV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). The laboratory analyses used enzyme immunoassay (EIA) and immunoblot methods for hepatitis antibodies. Human immunodeficiency virus antibodies (HIVAb) testing used Abbott Determine HIV-1/2 test (immunochromatographic qualitative test for HIV-1 and HIV-2 antibodies). There was no need for a confirming test, because there were no new HIV positive findings. S-ALT and S-GT were determined using quantitative methods. Elevated S-ALT for women is >45 U/l and for men >70 U/l. Elevated S-GT is in age ≤40 for women >45 U/l and for men >80 U/l, and in age >40 for women >75 U/l and for men >115 U/l (the cut-off levels in the Nordic Countries recommended by the Nordic Reference Interval Project) (Huotari & Linko, 2004).

4.3.3 Risk behaviour associated with virus infections (Study I)

In the interview, the participants were asked about intravenous use of drugs, sharing syringes/needles, safe sex habits (e.g. use of condom). In the questionnaire, the participants were asked about sexual abuse (perpetrated by a partner, a close relative or other person). The clinical examination included inspection of tattoos.

4.3.4 Maltreatment in childhood (Study II)

In the questionnaires, the participants were asked about being subjected to violence; if they had suffered physical abuse at home during their childhood (CPA), and if they had had violent sexual contact with an adult when they were under the age of 16 (CSA). In the interview, they were asked about out-of-home placement under the age of 15 and about the childhood household (living whole childhood with both parents or not). For the statistical analyses, a new variable labelled broken family was formed: those who had not lived their whole childhood with both parents and/or had had out-of-home placement under the age of 15 versus other subjects.

4.3.5 Somatic diseases, treatment and medication (Study III)

The somatic health questionnaires included nearly 200 items addressing lifetime somatic diseases and symptoms and their treatment by a physician. Somatic diseases were classified as cardiovascular, respiratory, gastrointestinal, genitourinary, musculoskeletal and skin diseases and accidents/injuries according to the International Statistical Classification of Diseases 10th revision (ICD-10) categories (World Health Organization, 1992). In addition, there was a separate category for viral hepatitis (A, B, C) and HIV infections. All other diseases and symptoms were included in the category “other” disease. In the interview, the respondents were asked about regular use of prescription medicines for various diseases, lifetime hospital care in different somatic/general departments, use of psychiatric out-patient and in-patient services and special services for substance abuse. They were also asked about chronically debilitating somatic diseases and mental disorders.

4.3.6 Work ability, employment and need for treatment (Study IV)

In the interview conducted by prison nurses, the participants were asked about their employment status before imprisonment, classes: employed, unemployed, out of work because of illness, other (housewife/-husband, student, military conscript). They were asked about their working experience (at least one long term of employment, at most short terms of employments). They were asked if they had a temporary or permanent disability pension or if they had been on sick leave before their imprisonment. Based on all data collected, experienced prison physicians conducted the clinical medical examination and made a personal summary of subjects' diagnoses (ICD-10), an assessment of subjects' work ability and reasons for impaired work ability. If the subject had chronic somatic diseases and/or mental disorders impairing the ability to work, the categories 'impaired work ability' or 'not able to work' were used according to the severity of the impairment. The reasons for impairment were categorized into three groups: somatic disease, mental disorder and substance abuse disorder. The physicians made an overall assessment of the need and reasons for treatment according to ICD-10 categories. It was possible to assess the work ability of 100 women and 300 men.

4.3.7 Substance dependence and other psychiatric disorders

Psychologists trained in the use of the method made the Structural Clinical Interview for DSM-IV Axis I and II Disorders (SCID-I, SCID-II) (First, Williams, & Spitzer, 1997; First, Gibbon, Spitzer, Williams, & Benjamin, 1997). The diagnostic information on substance abuse from the medical examinations by the prison physicians was included

in the substance dependence diagnoses. In Study I, the diagnosis of alcohol abuse/dependence was based on the SCID-I interview. In Studies II and IV the substance dependence and other psychiatric diagnoses were based both on the SCID interview and on the medical examination.

4.3.8 Pregnancy, contraception and diseases of the reproductive system

Information on pregnancies, (induced) abortions and contraception was elicited in the interview conducted by prison nurses. Safe contraception system included the use of contraceptive pills, an intrauterine device, a hormonal intrauterine device or a contraceptive implant. The diagnosis of an inflammatory genital disease was taken from the physician's summary of subjects' diagnoses. Sexually transmitted disease included a genital infection of lues / gonorrhoea / chlamydia / trichomonas / herpes / condyloma (ICD-10) but not HIV or hepatitis infections.

4.4 Statistical methods

For the comparison of categorical values Pearson's Chi-square and Fisher's exact tests were used when appropriate in the bivariate comparisons between men and women. In order to eliminate the possible effect of confounders, logistic regression method was used for multivariate analysis.

In Study I, in order to ascertain the effect of risk factors on HCV, two logistic regression models were carried out: in the first model (Model 1), age, cumulative years in prison, unsafe sex and sexual abuse were used as explanatory variables, and in the second one (Model 2) intravenous drug use (IDU), syringe/needle sharing and tattoo. Those explanatory variables were included in the final analysis which were significant predictors in the previous two analyses. This procedure was used because of the small number of events per variable in the female group.

In Study II, all the bivariate logistic regression analyses were also run using age as a possible confounder.

In Study III, a multivariate logistic regression model was used adjusted for age and social class if the number of events per variable allowed it.

In Study IV, a logistic regression model was used adjusted for marital status, social class, previous sentences and vocational education. In addition, a logistic regression model adjusted for dichotomised age (16–34/35–69), social class (high or middle/low) and vocational education (yes/no) was used to eliminate the possible effects of these background factors to the work ability among both women and men.

The statistical package of SPSS (version 16.0 for Windows) was used for the analyses. The significance level was $p < 0.05$ in all analyses.

4.5 Ethical approval

The study received approval from the Pirkanmaa Hospital District ethics committee and from the Finnish Ministry of Justice. Participation was voluntary and written informed consent was obtained from all participants.

5 RESULTS

5.1 Socio-demographic and criminal backgrounds

The mean age was 34.6 ± 10.0 SD (standard deviation) years among female, and 34.1 ± 10.4 SD years among male offenders ($p = \text{n.s.}$). Other background factors are presented in Table 2. Most of the prisoners belonged to the age group 25–44 years.

There was no significant difference in out-of-home placement < age 15 between females and males. A fourth of both genders had been placed out of home under the age of 15. Childhood without both parents was common in both groups (two thirds of subjects). Following this, “broken family” experience was equally common in both genders.

It was significantly more common for women to be married or cohabiting, to have children, to come from a lower social class and to have less vocational education. Two thirds of females and two fifths of males were married or cohabiting. Two thirds of women and half of men had children. Half of women and a third of men belonged to a low social class. Over half of females and a third of males had no vocational education. Men had previous sentences significantly more commonly than women. A third of women and a fifth of men were in prison for the first time. There was no significant difference in principal offence between genders. Crimes of violence was the commonest offence in both genders.

Table 2. Socio-demographic and criminal backgrounds of female and male prisoners

Variable	Women (N=101*)		Men (N=309*)		p
	n	%	n	%	
Age, years					0.204
16–24	19	18.8	54	17.5	
25–34	32	31.7	131	42.4	
35–44	32	31.7	71	23.0	
45–69	18	17.8	53	17.2	
Out-of-home placement < age 15					0.799
no	75	74.3	224	73.0	
yes	26	25.7	83	27.0	
Childhood with both parents					0.791
yes	37	36.6	117	38.1	
no	64	63.4	190	61.9	
Broken family**					0.975
no	37	36.6	113	36.8	
yes	64	63.4	194	63.2	
Marital status					0.008
Married or cohabiting	59	58.4	133	43.3	
Other	42	41.6	174	56.7	
Children					0.017
No	34	33.7	145	47.2	
Yes	67	66.3	162	52.8	
Social class					<0.001
High	11	11.6	45	15.3	
Middle	31	32.6	157	53.2	
Low	53	55.8	93	31.5	
Vocational education					0.003
Over two years	15	14.8	58	18.9	
Max. two years	31	30.7	140	45.6	
None	55	54.5	109	35.5	
Previous sentences					0.018
No	31	30.7	60	19.4	
One or more	70	69.3	249	80.6	
Principal offence***					0.068
Property	20	22.2	77	24.9	
Violence	36	40.0	125	40.5	
Driving under the influence	14	15.6	21	6.8	
Other	20	22.2	86	27.8	
Chronic impairing illness					0.247
No	52	51.5	176	58.1	
Yes	49	48.5	127	41.9	

*due to the missing values, the figure for women vary 90–101 and for men 295–309

**broken family: childhood at home without either parents and/or out-of-home placement < 15 y

***90 women

5.2 Viral hepatitis and HIV infections (Study I)

The prevalence of hepatitis C virus antibodies was 52%, hepatitis B surface antigen 0%, hepatitis A virus antibodies 38% and HIV antibodies 1% among women, 44%, 0.7%, 4% and 0.7% respectively among men. Among women, 71% of the age group 16–24 had HCV. There was no significant association between gender and HCV. Out of all HCV positive women, 96% already knew of their infection, among men the figure was 92%. The few HIV positive prisoners (one female and two males) knew of their infection. Considering liver function markers, a significant association was found with elevated S-ALT and HCV ($p < 0.001$) and also with elevated S-GT and HCV ($p < 0.001$) among men. Among women there was significant association only with elevated S-GT and HCV ($p = 0.003$).

In bivariate analyses, hepatitis C was more common among young women, while among men it was more common in the middle age groups. Women had syringe/needle sharing and unsafe sexual habits significantly more frequently. According to the multivariate analyses, after adjusting for age, cumulative years in prison, unsafe sex, sexual abuse, IDU, syringe/needle sharing and tattoo, among women, HCV was associated only with intravenous drug use and syringe/needle sharing whereas among men also with tattoos, cumulative years in prison and age. The HCV-positive women had more commonly experienced sexual abuse than the HCV-negative ones. Alcohol consumption and smoking were analysed as risk factors for liver diseases. Of the HCV-positive women 78% and 72% of the HCV-positive men had diagnoses of alcohol abuse/dependence in the SCID-I interview. Of the female prisoners 90% smoked regularly. Of the IDU women 63% and of the IDU men 60% had been vaccinated against hepatitis B (one or more vaccine doses). Vaccination against hepatitis A had been obtained by 31% of IDU women and men.

5.3 Childhood physical and sexual abuse (Study II)

It was more common for female prisoners to have suffered childhood physical and sexual abuse than for men (CPA in women 25% and in men 15%, $p < 0.026$, CSA in women 32% and in men 7%, $p < 0.001$).

Alcohol and drug dependence were equally common among female and male prisoners (55% in females and 63% in males, $p = ns$). Borderline personality (24% v. 10%, $p < 0.001$), mood (42% v. 27%, $p = 0.006$) and anxiety disorders (47% v. 25%, $p < 0.001$) were significantly more common among female prisoners. There was no significant difference in the prevalence of antisocial personality disorder between genders (58% in females, 65% in males, $p = ns$). (Study II, Table 2.)

Among women, both CPA and CSA were statistically significantly associated with alcohol dependence and borderline personality disorder and CSA with antisocial

personality disorder in the bivariate logistic regression analysis. Among men, CPA was statistically significantly associated with drug dependence, borderline personality disorder, mood- and anxiety disorders, but CSA only with mood disorder. The male prisoners also showed a connection between broken family and drug dependence and antisocial personality disorder. In both genders, age was negatively associated with drug dependence and antisocial personality disorder. Adjusting for age did not change the results of the logistic regression analyses.

5.4 Lifetime morbidity and use of health care services (Study III)

Almost half of the prisoners had at least one chronic illness that impaired their condition and there was no significant gender difference. Please see Table. 2. Most of these chronic illnesses were somatic (75% in women and 79% in men).

At least half of the women had a self-reported somatic disease in each disease group. The highest figures were seen in the category of accidents and injuries and genitourinary diseases. In the multivariate analyses (adjusted for age and social class), female prisoners reported viral hepatitis/HIV infections, genitourinary, musculoskeletal and “other” diseases significantly more commonly than men. Women had been more commonly treated by a physician due to cardiovascular, gastrointestinal, musculoskeletal, genitourinary and “other” diseases.

Four out of five women and half of men took some prescription medicine regularly. Odds ratio for regular use of medicines among women was 3.05 (95% CI 1.75–5.33) compared to men. The regular use of medicines because of respiratory, musculoskeletal diseases, mental disorders and insomnia was significantly more common among female inmates. The difference remained significant in multivariate analyses after adjusting for sex, marital status, social class and previous sentences. Over 90% of females reported lifetime hospital care, which was more common than among men (OR 3.10 (95% CI 1.38–7.00)). The difference between genders was seen in “other” department hospital care which in 96% of women was obstetric.

Female prisoners had used all psychiatric services more commonly than males. The multivariate analyses (adjusted for sex, marital status, social class and previous sentences) did not change these results. Of women, 70% and of men, 53% had used some psychiatric service during their lifetime. Of females, 66% had used out-patient services and 43% has been in psychiatric hospital care (in men respectively 46% and 31%). In the multivariate analysis, women were more frequent users of services for substance abuse (OR 1.70 (95 % CI 1.02–2.84)).

In the bivariate comparisons among women between diseases, service use, medications and socio-demographic variables (age, marital status, social class, previous sentences), no essential differences were found concerning marital status and social class. Age was associated with cardiovascular and respiratory diseases (older), infections (younger)

and the use of gastrointestinal medicines (older). Furthermore, age was associated with substance abuse treatment (younger). Among women, previous sentences were associated with accidents/injuries, hospital care in internal medicine and in psychiatric departments. The recidivists had been treated in a psychiatric department more than twice as frequently (51% v. 23%). However, among men, social class and marital status were associated with the use of psychiatric services, and previous sentences with infections, treatment in a surgical department and the use of substance abuse services.

5.5 Work ability and need for treatment (Study IV)

Among women, 78% were unemployed and only six percent were employed whereas among men, 63% were unemployed and 23% employed. Females were more commonly on a temporary disability pension or on sick leave than were males. Permanent disability pension had been granted to 5% of both genders. The working history was similar for women and men; half of them had had at least one long term of employment. According to the physician's assessment, the working capacity of women was significantly poorer than that of men. Of women, 42% and of men, 11% were unable to work ($p < 0.001$). The gender difference in work ability remained significant in a multivariate analysis adjusted for marital status, social class, previous sentences and vocational education ($p < 0.001$, OR 2.61 (95% CI 1.55–4.41)). Substance abuse disorders were the most common reason for impaired work ability (over 70% in both genders). Among women, other mental disorders were the second commonest reason (39%) and somatic diseases caused impairment in 23% of the females. Among men, the corresponding figures were respectively 26% and 29%.

The associations of work ability with socio-demographic factors differed between genders. Age, marital status, social class, vocational education and previous sentences were not associated with impaired work ability among women. Crimes of violence were significantly more common among both genders with limited working capacity. Among men, age (old), previous sentences and marital status (other than married or cohabiting) were associated with impaired/disabled work ability.

Of women, 94% and of men, 90% were in need of treatment. The need for treatment was assessed by a physician according to the categories of ICD-10. In both genders, most of the need for treatment was due to mental disorders. Among men, most of the mental disorder diagnoses were substance (alcohol or drug) abuse disorders (74%) but among women, about half of the diagnoses (52%) were other mental disorders. Of women 27% needed treatment for respiratory diseases, which included lung diseases such as asthma and chronic obstructive pulmonary disease. In men, the corresponding figure was only 7%. Women needed treatment more commonly for musculoskeletal diseases (most of them were various back problems) and for genitourinary diseases than did men. Men needed treatment more commonly for infectious diseases such as skin fungal diseases

and hepatitis C. The genitourinary diseases among females were mainly non-infectious genital diseases. The gender difference remained significant in a multivariate analysis adjusted for marital status, social class, previous sentences and vocational education.

5.6 Children, contraception and diseases of the reproductive system

Female prisoners had more commonly children than males (66% v. 53%). Please see Table 2. Of the women, 25% had three or more children, of the men 10%. Three mothers had a child with them in prison and none of the fathers.

Of the women, 35% had had one (induced) abortion, 17% two and 4% three abortions. Of the female subjects, 28% reported using safe contraceptive system. Inflammatory genital disease had had 55% of females and a sexually transmitted disease 42%. Safe sex habits (e.g. use of condom) had never been used by 61% of women. Experiences of sexual abuse (childhood and/or adult sexual abuse) had occurred in 48% of women.

Both sexually abused and IDU women had abortions, sexually transmitted diseases and inflammatory genital diseases significantly more commonly than other women. Please see Table 3.

Table 3. Associations of pregnancies, contraception and genital diseases with sexual abuse and intravenous drug use (IDU) among female prisoners (N=101)

Variable	Sexual abuse (%)			IDU (%)		
	no	yes	p	no	yes	p
Children	60	73	ns	63	68	ns
Abortion	43	69	0.010	37	65	0.007
Safe contraception ¹	26	29	ns	26	29	ns
Safe sex (never) ²	64	58	ns	66	59	ns
Sexually transmitted disease ³	28	56	0.004	26	50	0.018
Inflammatory diseases of the female reproductive system ⁴	38	75	<0.001	31	68	<0.001

¹ the use of contraceptive pill, intrauterine device, hormonal intrauterine device or contraceptive implant

² e.g. use of condom

³ lues, gonorrhoea, chlamydia, trichomonas, genital herpes, condyloma

⁴ N7 (ICD-10)

6 DISCUSSION

6.1 Viral hepatitis and HIV infections

6.1.1 Hepatitis C infection

The Finnish prisoners had a high prevalence of hepatitis C infection. Female prisoners had higher prevalence than males but the difference was not significant.

The high HCV prevalence was in accordance with the high prevalence of IDU among Finnish prisoners. In Finland, there have been some 1,100–1,200 new HCV infections annually (Hulkko et al., 2011). In the last decade the trend has been declining but in 2010 it increased slightly (in 2009 1,050 cases and in 2010 1,132 cases). Of Finnish IDUs 55% are HCV positive (Hulkko et al., 2011). Among prisoners the figure is higher: 80% in females and 73% in males.

Among general Finnish population in young age groups (15–19, 20–24 year olds), the annual number of new HCV infections has been stable or even declining, but in the age groups over 25 years, it has been slightly increasing (Hulkko et al., 2011). The present results for Finnish prisoners showed that among females, the highest prevalence of HCV was in the youngest age group (16–24 year) whereas among males it was found in the older group (25–34 year). Because HCV was especially common among young females, it may cause extensive problems in the future. Among Finnish drug users they might be a special subgroup which takes more risk associated with IDU. The preventive measures which have confined HIV infections among IDUs in Finland, seem not to have been successful in reducing HCV infections among young female prisoners.

In the prison studies conducted in the United States, an association with HCV was found for older prisoners, whereas in studies conducted in Italy, Greece and Australia the connection with age has been U-shaped as in the male group in the present study (Babudieri et al., 2005; Fox et al., 2005; Miller, Bi, & Ryan, 2006; Ruiz et al., 1999; Santana Rodriguez, Male Gil, Hernandez Santana, Liminana Canal, & Martin Sanchez, 1998; Solomon et al., 2004).

The meta-analysis by Vescio et al. (2008) showed that HCV prevalence tends to be higher among female than male prisoners. This differs from that in general population. In Finland in 2010, 66% of infections were in men and 34% in women (Hulkko et al.,

2011). Finnish female prisoners had a higher prevalence of HCV than males – however, the difference was not significant.

In the present study, both genders showed a significant association between HCV and IDU and syringe/needle sharing. It has been also reported that the use of non-sterile injecting equipment is the most important independent risk factor for transmission within prison for both HIV and viral hepatitis (Jürgens et al., 2009).

Finnish female prisoners showed no associations between prevalence of hepatitis C and previous sentences and cumulative years in prison, whereas these associations were found among male offenders and in previous studies in other countries (Allwright et al., 2000; Babudieri et al., 2005; Fox et al., 2005; Long et al., 2000; Weild et al., 2000). The explanation may be that it was more common for the females to be first-time prisoners, and they had shorter cumulative time in prison than the males.

Tattoos were equally common in both groups, but an association between tattoos and HCV was found only among men. This may have a connection with male inmates' longer time in prison, although the place where the tattoo was created (in or outside prison) was not elicited. In the study by Hellard, Hocking and Crofts (2004), tattooing in prison was a risk factor for HCV. A recent meta-analysis (Vescio et al., 2008) also showed an association between tattoos and HCV in prison inmates, even after having taking IDU status into account. In prison there is a higher likelihood of sharing tattooing equipment and sterilisation equipment is more difficult to obtain, even though in Finnish prisons disinfectant substances can be found in communal shower rooms, and every prisoner receives a hygiene kit containing disinfectant on entering prison.

Finnish female prisoners seemed to exhibit more risky behaviour concerning IDU and other drug related life styles than males. Syringe/needle sharing and non-safe sex practices were more common among women. Considering that among both genders nearly everyone already knew about their HCV infection on entering prison, this risky behaviour was alarmingly widespread.

In 75% of chronic HCV infections, the level of S-ALT is changing or is steadily increasing (Färkkilä, 2010). Of HCV positive female prisoners many had elevated S-ALT. However, it is noteworthy that 21% of HCV-negative women also had elevated S-ALT, whereas men showed a significant association between high S-ALT and HCV. One possible explanation is that 70% of the female subjects in this study were diagnosed with alcohol abuse/dependence (Lintonen et al., 2011) and that women are more susceptible to liver damages caused by alcohol than men. An even higher proportion (78%) of HCV-positive females had diagnoses of alcohol abuse/dependence and the combination of alcohol abuse and HCV increases the risk of cirrhosis and hepatocellular carcinoma. Smoking and especially cannabis use may increase the risk of liver fibrosis in hepatitis C (Pessione et al., 2001; Seeff, 2002). Of the female subjects in this study, 90% smoked regularly and 70% had used cannabinoids at some point in their lives (Lintonen et al., 2011). Although the Finnish female prisoners with HCV

are young, and young females seem to develop chronic hepatitis C infection less often/more slowly, HCV infection associated with heavy alcohol use and regular smoking makes them high risk patients (Freeman et al., 2001; Seeff, 2002).

Hepatitis C is one of the leading causes of chronic liver diseases (end-stage cirrhosis and liver cancer) in Western countries (Lauer & Walker, 2001). The most common complication of cirrhosis caused by HCV, is cancer of the liver (Benvegnú, Gios, Boccato, & Alberti, 2004). Viral hepatitis with cirrhosis of the liver is the most important cause of liver transplantations in Europe (38%). The proportion of hepatitis C among liver transplantations is 62% (Färkkilä, 2010). The high rate of HCV infections, especially among young female prisoners, can cause extensive problems in the future. Female IDU prisoners are a highly marginalized group with high risk behaviour concerning drug-related lifestyle. Also, mental disorders complicate and undermine their abilities to cope in life.

6.1.2 HIV infection

The prevalence of HIV among female and male prisoners was on the same level as that estimated among Finnish IDUs (1.4%) (Salminen, 2008). These three prisoners (one woman and two men) were already aware of their infection. One feature of the Finnish HIV epidemic is that hardly any IDU-associated HIV cases were recorded during the 1980s and at the beginning of the 1990s. In 1998, the situation changed, and an outbreak was recorded among IDUs mainly in the Helsinki area. After prevention efforts (Low Threshold Health Service Centers for IDUs, rapid testing, injection equipment exchange etc.) were initiated, the outbreak subsided and the prevalence never rose above 5% among Finnish IDUs (Salminen, 2008). In 2010, the National Infectious Diseases Register received notifications of 118 new infections (Hulkko et al., 2011). Of those, only six cases were among IDUs (one Finnish citizen and five foreigners). In contrast to HCV infections, the level of HIV infections among prisoners has stayed as low as among other IDUs. One reason may be that medication for HIV is readily available for all groups in Finland. Also, drug abusers commonly do not regard HCV infections to be as harmful to health as HIV infections might be.

6.1.3 Hepatitis B infection

The prevalence of chronic B hepatitis carriers among male prisoners was higher than in general among Finnish-born citizens (0.22%) (Leino, 2006). Female prisoners may not have a much higher prevalence than male prisoners because there were no HBsAg positive females. The number of acute hepatitis B infections has declined substantially since the late 1990s and has decreased most rapidly among IDUs (Hulkko et al., 2011).

In Finland, there has been a targeted hepatitis B vaccination programme for risk groups since 1993, and the programme was expanded in 1998. One target group is intravenous drug users, their permanent sex partners and members of the same household. According to an evaluation of the programme, over half of IDUs had been vaccinated and new infections among risk groups were clearly limited, which was also partly due to the extended needle exchange programme in Finland (Leino, 2006). The vaccination figures among Finnish prisoners were at the same level. In a study on Danish prisoners (Christensen et al., 2000) from 1996–97, only 2% of IDUs had been vaccinated against HBV, whereas in the study on Irish prisoners, 62.5% of IDUs had received one or more doses of hepatitis B vaccine (Allwright, Barry, Bradley, Long, & Thornton, 1999). In a British study, 45% of IDU females had received three doses of vaccine (Plugge, Yudkin, & Douglas, 2007). The figure was the same among Finnish IDU female prisoners.

6.1.4 Hepatitis A infection

Of the Finnish female offenders 38% had HAV antibodies (HAVAb). This may be a result of vaccination (hepatitis A vaccination was taken into the targeted vaccination programme in 2005). However, in Finland there were two hepatitis A epidemics among IDUs in 1994–95 and 2002–03, mainly outside prison, but there were also some cases in prison (Hulkko, Lyytikäinen, Kuusi, Seppälä, & Ruutu, 2010). The male prisoners had a lower prevalence of HAVAb (4%). In the reception interview conducted by prison nurses, 30% of IDU men reported having received hepatitis A vaccination, but the information about this interview was only available for 243/300 (80%) of male prisoners. It can be speculated that men may have confused the vaccinations for different types of hepatitis, i.e. A and B. Also, women may be more active in health-related issues; getting vaccinated against a known risk. Furthermore, health care personal may be more active in offering vaccinations to women.

In Finland, hepatitis A infections have been rare since 2002–2003 (Hulkko et al., 2011). This is probably a result of good vaccination protection among travellers and risk groups. In 2010 there were 14 new cases and only two of these were contracted in Finland.

6.2 Maltreatment in childhood, substance abuse and mental health problems

The reported levels of CPA and CSA among women were quite low compared to those reported in other prison studies (Browne, Miller, & Maguin, 1999; Carlson & Shafer, 2010; Clements-Nolle et al., 2009; Dembo et al., 2007; McDaniels-Wilson & Belknap,

2008; McNamara & Fields, 2002; Raj et al., 2008; Warren et al., 2002). However, methodological inconsistencies make it difficult to compare the results and moreover, the criminological differences between countries affect the results of prison studies. The figures for both genders are high compared to the results of Finnish studies among general population (Laaksonen et al., 2011; Lepistö et al., 2011; Peltonen et al., 2010).

CPA was more common among women than men whereas in studies elsewhere among general and prison populations the difference between genders has not been so marked (Bierer et al., 2003; Dembo et al., 2007). This gender difference was also seen in CSA among Finnish prisoners, which is consistent with earlier studies among general populations (Bierer et al., 2003; Hebert, Tourigny, Cyr, McDuff, & Joly, 2009; Pereda et al., 2009) and prisoners (Dembo et al., 2007). In Finnish general population studies, the prevalence of both CPA and CSA was more common in women/girls than in men/boys (Laaksonen et al., 2011; Peltonen et al., 2010).

Alcohol dependency especially but also drug dependency was high among Finnish prisoners both compared to prison studies (Fazel et al., 2006) and Finnish studies among general population (Partanen et al., 2007; Pirkola et al., 2005a). The prevalence of antisocial personality disorder was high especially in Finnish female prisoners and there was no gender difference. In a systematic review of prison studies, 21% of women and 47% of men had antisocial personality disorder (Fazel & Danesh, 2002).

In the present study, female and male prisoners had several differences in the associations of CPA and CSA with mental disorders and substance abuse (SU). CPA was associated with alcohol dependence and borderline personality disorder among women and with drug dependence, borderline personality and mood and anxiety disorders among men. CSA was associated with mood disorders in men only, but in women with alcohol dependence, borderline and antisocial personality disorders. Other studies among general population and prisoners have reported connections between childhood maltreatment and SU (Arellano, 1996; Danielson et al., 2009; Douglas et al., 2010; Simpson & Miller, 2002; Thornberry, Henry, Ireland, & Smith, 2010; Tucci, Kerr-Corrêa, & Souza-Formigoni, 2010), personality disorders, especially antisocial personality disorder (Carlson, Egeland, & Sroufe, 2009; Coid, 1999; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Pakiz, Reinherz, & Giaconia, 1997; Roberts, Yang, Zhang, & Coid, 2008), and depression and anxiety problems (Chartier, Walker, & Naimark, 2009; Douglas et al., 2010; Tucci et al., 2010; Wilsnack, Vogeltanz, Klassen, & Harris, 1997; Wilson & Widom, 2009). These connections have varied according to gender difference and the form of abuse. There are several factors which may lead to the inconsistent results: the definitions of childhood abuse, measurements of mental disorders and SU, research methods and sample characteristics. Prisoners are a highly selected part of the population. They have experienced many other adversities in their lifetime and come from a lower social class. These characteristics are especially common in female prisoners (World Health Organization, Regional Office for Europe, 2009).

All these may contribute to the development of mental disorders and SU problems in adulthood.

According to a review, research findings found a link between child maltreatment and SU (Arellano, 1996). In a large, nationally representative sample of 1,099 U.S. women, subjects with histories of CSA significantly more commonly reported recent alcohol use, intoxication, drinking-related problems and alcohol dependence symptoms, lifetime use of illicit drugs, depression and anxiety than women without CSA (Wilsnack et al., 1997). In an Australian twin study (6,050 twins), CSA was associated with illicit drug abuse/dependence (Nelson et al., 2006). Among a cohort of high-risk young Canadian (560 participants), only CPA was associated with injection drug use, not CSA (Kerr et al., 2009). Childhood abuse was positively related to lifetime substance dependence and mood and anxiety disorders in a U.S. study among 2,061 individuals (Douglas et al., 2010). In a study among U.S. young adults, trauma-related risk factors for alcohol and drug abuse differed for men and women (Danielson et al., 2009). In that study, sexual abuse was a common predictor for alcohol and drug abuse in young women, while physical abuse and posttraumatic stress disorder were common predictors for alcohol and drug abuse in young men.

Childhood maltreatment has been shown to increase the risk for personality disorders (Carlson et al., 2009; Johnson et al., 1999). In a study on male prisoners in England and Wales, prisoners with personality disorders reported adverse childhood experiences and victimization more commonly than those with no personality disorder (Roberts et al., 2008). In another study on early risk factors for serious antisocial behaviour among young adults in the U.S., negative family environment was identified as a risk factor and different patterns were found for males and females (Pakiz et al., 1997). For females, the predictors were parental divorce and a history of family sexual abuse, whereas for males the predictor was a history of physical abuse.

Earlier non-prison studies have reported connections between childhood abuse and depression or anxiety problems, but few studies have used standardized diagnostic instruments for measuring mental disorders (Chartier et al., 2009; Douglas et al., 2010; Tucci et al., 2010; Wilsnack et al., 1997; Wilson & Widom, 2009). Among Finnish female prisoners there was no connection between childhood abuse and mood or anxiety disorders. Among male prisoners there was a significant association between CPA and CSA and mood disorder, and also between CPA and anxiety disorder.

The present results regarding family integrity and SU and mental disorders were quite different from the results for general population. Among female prisoners there was no association between broken family and SU and mental disorders. Among men, poor family integrity was associated with drug dependence and antisocial personality disorder. In studies among general population, parental divorce was found to be associated with depression, anxiety and alcohol abuse disorders among females but not among males (Pirkola et al., 2005b). Also, other researchers have shown that women

are more vulnerable to the after-effects of several stressful or traumatic events (Veijola et al., 1998) and that they are more sensitive than men to the influence of childhood separation (Rodgers, 1994). Female prisoners have faced other and severe adversities in childhood (like CPA and CSA) which may affect the development of mental disorders and substance abuse problems in adulthood more than family integrity. Also, their hard substance use problems starting in young age may affect the development or progression of later mental health problems.

6.3 Lifetime somatic diseases, use of health care services and medication

Earlier studies have shown that prisoners often have multiple chronic health problems (Australian Institute of Health and Welfare, 2011; Baillargeon et al., 2002; Binswanger et al., 2010; Butler et al., 2004; Fazel & Baillargeon, 2011; Friestad & Skog Hansen, 2004; Hannon et al., 2000; Harzke et al., 2010; Wilper et al., 2009; World Health Organization, Regional Office for Europe, 2009) and chronic conditions seem to be more prevalent among female prisoners (Baillargeon et al., 2002; Binswanger et al., 2010; Butler et al., 2004; World Health Organization, Regional Office for Europe, 2009). The numbers of chronic medical conditions reported vary in different studies: from one fourth to four fifths of prisoners. The term chronic conditions may include not only physical diseases but also mental disorders, thus making comparison of the results difficult. In the present study, nearly half of the subjects had a chronic disorder which moreover impaired their health. There was no significant difference between genders. Among Australian prisoners, 26% of prison entrants had a current chronic condition (Australian Institute of Health and Welfare, 2011). In another Australian prison study 81% of women and 65% of men had suffered from at least one chronic health condition (Butler et al., 2004). The survey of US prisoners showed that 39% to 4% of the inmates had a chronic medical condition (Wilper et al., 2009).

In the nationally representative Finnish Health Survey 2000, out of the population aged 30–44 years, 33% of women and 30% of men, and of the population aged 18–29 years, 25% of women and 24% of men had at least one chronic illness (Aromaa & Koskinen, 2004; Koskinen, Kestilä, Martelin, & Aromaa, 2005). The sample of the present study was young; when comparing the results of chronic diseases, it is evident that Finnish prisoners have more health problems than general population.

The most prevalent diseases among both genders were accidents/injuries (over 80%), musculoskeletal and respiratory diseases and among females, also genitourinary and gastrointestinal diseases. Genitourinary diseases were more common among women, which has a natural explanation: urinary tract infections. The extremely high figures for accidents/injuries also show what complicated lives prisoners lead outside prison. The

category “other diseases” was more common among women. It included e.g. diabetes, epilepsy, migraine, headache and anaemia.

Many women suffering from somatic illnesses had been treated by a physician. Women were more commonly treated for cardiovascular and gastrointestinal diseases than men. In other disease groups no gender difference in treatment was detected or the disease was also more common among females. Exceptionally, despite the frequency of hepatitis infections among women, they had not been more frequently treated. There are few studies on prisoners’ use of health care services and they concern mainly mental services. In Australia, 76% of prison entrants had consulted a medical professional during the preceding 12 months (Australian Institute of Health and Welfare, 2011). Among male inmates in Kentucky prisons, the inmates with substance abuse and mental health problems reported significantly greater use of emergency services and more hospital stays both throughout their lives and during the year prior to their incarceration than those without these problems (Hiller et al., 2005). In an earlier Finnish study on prisoners in 1985 (Joukamaa, 1991), 79% of women and 90% of men reported having used some outpatient service because of somatic disease.

Among Finnish prisoners, the regular use of medicines doubled in twenty years (Joukamaa, 1991). Taking prescription medicines is common and has also increased among Finnish population (Aromaa & Koskinen, 2004). Female prisoners used medicines significantly more commonly than men. The same gender difference is seen in adult general population. In the Finnish Health Survey 2000, 69% of females and 46% of males were taking prescription medicines at the time (Häkkinen & Alha, 2006). An Irish study on prisoners also reported a similar gender difference and heavy use of medicines among female prisoners (Hannon et al., 2000). Other studies on prisoners, mainly men, have reported lower figures (Australian Institute of Health and Welfare, 2011; Wilper et al., 2009). Among Finnish prisoners, a gender difference was found in medications for respiratory, musculoskeletal and mental diseases, insomnia and the group other diseases. Except for respiratory diseases, this concurs with the frequency of these diseases. The heavy use of respiratory medicines could be partly connected to the fact that 90% of female prisoners smoked regularly and 70% had used cannabinoids in their lifetime (Lintonen et al., 2011).

The use of medication for mental disorders was especially heavy among female prisoners. Of adult Finnish population, 4% of women take medication for mental health problems (Häkkinen & Alha, 2006). Among general population, too, the use of psychotropic medication has increased in Finland: e.g. the use of antidepressants has increased almost tenfold during the last 20 years (Lääkealan turvallisuus- ja kehittämiskeskus Fimea ja Kansaneläkelaitos, 2011). In an Irish study on prisoners, the female preponderance was also seen in the use of medications for mental disorders and insomnia, but, on the other hand, not in the use of respiratory medication or analgesics (Hannon et al., 2000). Substance abuse is very common among Finnish prisoners

(Lintonen et al., 2011) and part of medication can be linked to the misuse of medicines, such as analgesics and benzodiazepines.

Lifetime hospital care has increased among prisoners and more among females. In the study of 1985, 65% of women and 74% of men had been in hospital care for somatic reasons (Joukamaa, 1991). The gender difference found in hospital care was connected to the care in some “other” department. Among women, this was mainly obstetric. Over 60% of prisoners had been treated in a surgical department; this is not surprising because of the large number of accidents or injuries. Among Finnish adult population, 40% of women and 34% of men had been in hospital care during the past five years (Häkkinen & Alha, 2006). There are very few studies on hospital care for physical diseases among prisoners. In a U.S. study among male prisoners, those who suffered from substance abuse and mental health problems had more lifetime hospital stays than others (86% v. 60%) (Hiller et al., 2005). The first figure is close to the results for Finnish prisoners. Among another marginalized group, it was found in Sweden that homeless people had twice the risk of being hospitalised for physical diseases compared to general population (Beijer & Andreasson, 2009).

The majority of female and half of male prisoners had used psychiatric services during their lifetime. In a Finnish study on prisoners in 1985 (Joukamaa, 1991), 73% of women and 52% of men had used some psychiatric outpatient service (including special services for alcohol and substance abuse) while 30% of women and 23% of men had received psychiatric in-patient treatment. The figures for the use of psychiatric outpatient services have increased during two decades apart from the services for alcohol and substance abuse. The use of psychiatric in-patient hospital care has increased even more, regardless of the intensive reduction of hospital beds in Finland after the first study on prisoners (Pirkola & Sohlman, 2005). The use of all psychiatric services was significantly more common among female prisoners. The gender difference in the use of services can also be seen in general population, although the figures differ substantially. Among Finnish adults, 7% of women and 4% of men had used some mental health service during the preceding 12 months (Häkkinen & Alha, 2006). Of Finnish young people aged 18–29, 17% of females and 7% of males had used mental health services (Häkkinen & Alha, 2006).

Mental disorders are more common worldwide in prisoners than in general population (Fazel & Baillargeon, 2011). In a U.S. study, 13% of female jail inmates had previous psychiatric hospitalisation, 14% had previous out-patient treatment and 30% had received or were waiting for substance abuse treatment (Drapalski et al., 2009). Among women entering a North Carolina prison, 54% had received psychiatric or substance abuse treatment in their lifetime (Jordan et al., 2002). Some studies have reported gender differences. Females had reportedly received help more commonly for mental problems in a British study (Farrell et al., 2006), whereas in a U.S. study no

gender difference was detected in the psychiatric treatment history (Drapalski et al., 2009).

Substance abuse has increased among Finnish prisoners in recent decades (Lintonen et al., 2011) and 84% of female and male prisoners been given the diagnoses of lifetime substance dependence (Lintonen et al., 2011). The use of psychiatric and substance abuse services by Finnish female prisoners is high indicating a high prevalence of mental disorders but also an even higher prevalence of abuse problems.

Recidivist female prisoners were more prone to accidents/injuries and were treated twice as commonly in a psychiatric department than were first offenders. These may have to do with severe substance abuse or other mental disorders requiring psychiatric in-patient treatment. Among men, a difference was seen in the use of substance abuse services but not of other psychiatric services.

The heavy use of health care services among female prisoners is in accordance with their high morbidity related especially to substance abuse, mental disorders, infections and injuries. Compared to male prisoners, the frequency of using health care services and medications were mainly associated with morbidity among female prisoners.

6.4 Work ability and need for treatment

The nearly 80% unemployment rate among female prisoners is about ten times that of the Finnish general female population (Statistics Finland, 2011). The gender difference was also greater among prisoners than in general population (80% of female and 63% of male prisoners vs. 8.1% and 7.5% of general population). In the WATTU Study 1985, the employment rates were better; about half of prisoners were unemployed (46% of females and 51% of males).

Unemployment has been related to socio-demographic risk factors such as gender, homelessness, low education, delinquency and to mental health issues (Giles & Le, 2007; Gould et al., 2008; Honkonen et al., 2007; Webster et al., 2007). Some studies show that repeat offenders are less likely to have been employed than first-time offenders (Giles & Le, 2007). This Australian study suggested that the personal characteristics (e.g. age, gender, marital status) that reduce the employability of prisoners before their current incarcerations also reduce their labour market aspirations after release. Males were more likely to be employed than females. There was also positive relationship between educational attainment and employment, and marital status (being married) and employment. Ex-prisoners were more likely to face long-term unemployment than people with poor skills (e.g. low level of education). The authors suggested that the lack of labour market success among ex-prisoners may be attributed in part to the stigma attached to criminality (Giles & Le, 2007). The Finnish female prisoners came from a lower social class and had less vocational education but were more commonly married/cohabiting than male prisoners whereas male prisoners had more previous sentences.

In a U.S. study among drug abusers, women had more mental health problems and employment barriers, supporting the notion that the gender difference is mediated by differences in mental health problems (Webster et al., 2007). The Health 2000 Study showed that in general population the common mental disorders are less prevalent among employed than among unemployed and economically inactive people (Honkonen et al., 2007). Johansson, Alho, Kiiskinen, and Poikolainen (2007) used the same sample of the Health 2000 study. They examined to what extent alcohol-dependent individuals underperform non-alcohol-dependent individuals in terms of employment probabilities on the Finnish labour market. Alcohol dependence was associated with lower employment probabilities among both men and women. Finnish prisoners and especially females have severe substance abuse problems (Lintonen et al., 2011) and more mental health disorders than general population.

Most female prisoners had impaired working ability or were unable to work. The working capacity of women was significantly poorer than that of men. Only a third of female prisoners were fully able to work. This is an alarmingly low figure in a population group with a mean age of 35 years. Over 70% of both genders had substance abuse disorder as one reason for impaired work ability. Among women, other mental disorders were the second most common reason. In the WATTU project 1985, also about one third of women were fully able to work (Joukamaa, 1991). However, clearly fewer women than in the present study were unable to work (18%). The proportion of females with impaired work ability was by contrast more than (49%). Also then, mental disorders were the most important reason for disability. In the 1985 study, there were few females and this must be taken into account when comparing the results. Among men, the trend in work ability between 1985 and 2006 was different. In 1985, men were less commonly fully able to work (43% v. 54% in 2006) and were more commonly unable to work (15% v. 11% in 2006).

In Finnish general population, mental disorders were the most common reason for disability pensions granted in 2006 (Finnish Centre for Pensions & Social Insurance Institution of Finland, 2007). Among young Finnish adults, the highest risks for limited work ability are unemployment, lack of sufficient basic education and mental problems (Gould et al., 2008). All these three factors are typical characteristics of prisoners and especially of female prisoners.

In the present study, most women with limited work ability did not have a temporary or permanent disability pension or sick leave before their imprisonment. The prisoners had severe substance use problems. Their life outside prison is usually chaotic and they are unable to take proper advantage of the services society provides. In 1985, about the same proportion of prisoners had sick leave or disability pension (21% of women and 11% of men) as in 2006. In general Finnish population aged 16 to 54 years, among women 3.6% and among men 4.3% had a permanent disability pension in 2006

(Finnish Centre for Pensions & Social Insurance Institution of Finland, 2007). These are slightly lower figures than those in the prisoner sample.

Among male prisoners, the associations of socio-demographic characteristics with work ability were similar to what has been reported in other studies on prisoners (Giles & Le, 2007). A history of violent crime was the only background factor associated with poor work ability among women. Common features for violent Finnish females and males include early disadvantaged life and substance abuse (Putkonen, 2011). In a Finnish study, the risk factors for females' violence were previous criminality, personality disorder and substance abuse, alone or associated with mental disorder and psychotic disorder (Putkonen et al., 2001a). The reasons for impaired work ability among violent offenders may be their high prevalence of substance abuse and mental health problems. Age was not associated with work ability in women in the present study. The explanation is probably that substance dependence is more common in young age groups. Work ability of the general Finnish population improved over a period of two decades (Gould et al., 2008). The simultaneous change in the population's educational level explained the decrease in work ability limitations among women and for the most part among men. The level of vocational education has improved among prisoners, too, but obviously it cannot compensate for the huge increase of substance abuse problems from 1985 to 2006.

Nearly all prisoners were in need of some medical treatment and there was no gender difference. Over 90% of both genders were in need of mental health treatment. The need for substance abuse treatment services was considerable among prisoners. In addition, female prisoners were clearly in greater need of treatment for other mental disorders than males. A similar gender difference was also seen in respiratory and musculoskeletal diseases and naturally in genitourinary diseases. Female prisoners are heavy-smokers and this may predispose them to respiratory symptoms. Men more commonly had treatment needs in the disease group infections and parasites. This group includes mycotic infections of the skin, which were common in males. Compared to the first Finnish health survey of prisoners in 1985, the need for treatment has increased, especially for mental disorders (Joukamaa, 1992). In the Health 2000 Study, among general population in the age group 30–64 years 37% of women and 27% of men were in need of medical attention due to a chronic condition (Aromaa & Koskinen, 2004). The high figures among prisoners should be taken into account when arranging prison health care services.

6.5 Contraception and reproductive diseases

In the Health 2000 Study among women aged 18–29 years, 9% had had (induced) abortions and among those aged 25–29 years 12% (Nikula, Koponen, Haavio-Mannila, & Hemminki, 2007). Respectively 21% and 26% had had sexually transmitted

infections (herpes, condyloma, chlamydia) and 85% and 82% of women were being provided with contraception. About half of them were currently using condoms. Regardless of the fact that the female prisoners were older (mean age 35 years), it can be estimated that they had had more abortions and sexually transmitted diseases and they used contraception and condoms less frequently than women in general. A U.S. study among female inmates in the Rhode Island correctional system found that 47% of women had a history of sexually transmitted infection (syphilis, pelvic inflammatory disease, condyloma, herpes, HIV/AIDS) and 61% had used birth control consistently in the last three months (Bonney, Clarke, Simmons, Rose, & Rich, 2008). Finnish female prisoners had sexually transmitted diseases at least as commonly but they rarely used contraception.

There are some studies among prisoners on the positive associations of childhood sexual abuse with high-risk drug abuse and risky sexual activities (Mullings, Marquart, & Hartley, 2003). The present findings among Finnish female prisoners suggest similar associations.

6.6 Methodological considerations, limitations and strengths of the study

It was confirmed in advance that the samples were representative of Finnish prisoners in general as regards socio-demographic background and criminal histories. The female sample covered 41% of all Finnish female prisoners. The admission policies and coverage areas were the same for women and men.

The study received approval from the Pirkanmaa Hospital District ethics committee and from the Finnish Ministry of Justice. Participation was voluntary and written informed consent was obtained from all participants.

The health questionnaire form was found very applicable in the studies on prisoners' health of 1985 and 1992 (Joukamaa, 1991). Similarly the interview conducted by nurses was in accordance with the earlier study practice (1985, 1992). The nurses were experienced and well trained in interviewing. The SCID interview is an effective and validated screening standard for psychiatric disorders. The psychologists were trained in the use of SCID interviews. Experienced prison physicians conducted the clinical examinations and produced a diagnostic summary based on all the data collected.

Altogether, the study methods were more comprehensive and the results more reliable than in the studies of 1985 and 1992. The diagnosing of mental disorders especially was more valid.

The study has several limitations. In Study I, the laboratory tests were taken from 88 women, so it was not possible to analyse the risk factors in the whole female sample. The information on vaccination was gathered from reception interviews, which were conducted by both prison nurses and nurses who were informed of the study. This may have influenced the quality of the vaccine information. Only the carriers of chronic

hepatitis B (HBsAg) were tested, not how many had had HBV infection in their lifetime. In Study II, only fairly rough indicators of CPA and CSA were used, not standardized interviews, and it was not possible to analyse the effects of parental substance abuse or parental mental health. In Study III lifetime use of health care services was elicited thus recall bias is a possibility. In many studies, information in the preceding 12 months is used instead of lifetime. This made it somewhat difficult to compare the results with those of earlier studies.

Comparison with other studies on prisoners is difficult. Prisons and prison populations are very different. Most of the evidence on the health of the prisoners comes from U.S.A., the U.K., Europe and Australia (Andersen, 2004). The racial and ethnic differences of offenders between countries, even within the Western Europe but especially regarding studies in the U.S.A. affect the results of health studies. Black and Hispanic races are common in U.S. prison studies. In the Finnish prison health survey 2006, foreign offenders were excluded and the female prisoners were either white or Roma.

Most of the offences for which women are imprisoned worldwide are non-violent, property or drug-related. Drug couriers frequently use women, often from low-income countries, to smuggle drugs across borders for a small amount of money (United Nations Office on Drugs and Crime, 2008). In Finland, female prisoners are most commonly sentenced to imprisonment for crimes of violence (Rikosseuraamuslaitos, 2011). This differs from the situation in European countries, where crimes relating to drugs and property are more common among women (Quaker Council for European Affairs, 2007). In Finland, violence among women is closely associated with substance abuse. Worldwide and also in the same country, criminal legislation and application in practice change over time, as does the profile of crimes. The prison population is not homogenous over the course of time in one country and much less between countries.

The present study represents the population of Finnish female and male prisoners comprehensively. It was possible to compare the genders. In most studies on prisoners it is not possible to find results for females, because male offenders are in the majority. The study was comprehensive and combined different methods and standardized psychiatric diagnostic instruments were used.

7 CONCLUSIONS AND IMPLICATIONS FOR THE FUTURE

7.1 Conclusions

The findings of the present study permit the following conclusions:

1. Earlier results of studies with only male prisoners cannot be generalized to females. Finnish female prisoners have different socio-demographic and criminological characteristics from men, and there are also gender differences concerning health and health-related factors.
2. In two decades, there has been a total change in the character of Finnish female prisoners with increases in IDU and other drug-related life-style factors including a change of criminality although certain “old Finnish ways” persist such as heavy alcohol consumption. Finnish female inmates have reached and are even surpassing males when it comes to drug abuse and associated problems.
3. Female prisoners have a high prevalence of HCV which is in accordance with the high prevalence of IDU among them. They seemed to have engaged in more risky behaviour concerning IDU and other drug-related life-styles than males. Considering that nearly all subjects were already aware of their HCV infection entering prison, the risky behaviour was alarmingly common. Young female offenders are a special risk group for hepatitis C. Preventive measures confined to HIV infections among IDUs in Finland, seem not to have been successful in reducing HCV infections among female prisoners.
4. Childhood sexual abuse is well known to be more common among women than men, but for Finnish female prisoners physical abuse has also been a significantly more common experience. There were several gender differences between childhood adversities and substance abuse or lifetime mental disorders and the gender differences differed from those reported for general population.
5. The female prisoners had more health problems and used health care services more frequently than did male prisoners. The heavy use of health care services is

in accordance with their high morbidity, especially due to substance abuse and mental disorders, infections and injuries. Although among general population it is the high-income individuals who consult physicians more frequently, this as such, is not seen among prisoners. Prisoners have several contacts with health care services during their lifetime offering opportunities for treatment, thus in that respect they cannot be considered “marginalized”. However, the type of health care services used by prisoners inevitably focuses on acute illnesses and emergency treatment rather than on long-lasting treatment relationships or even preventive services. The heavy regular use of prescription medicines is connected to mental disorders.

6. Many factors, both individual and in society (like the labour market, employers’ attitudes) affect the employment of prisoners in different ways, but health issues, especially mental health and substance abuse, are of crucial importance. Finnish female prisoners have serious problems with substance abuse, including both alcohol and drug abuse, which impairs their work ability, employment prospects and causes their need for treatment. In addition, female prisoners have other mental disorders frequently complicating their situation.

7.2 Clinical implications

Prisoners spend short periods in prison and females re-offend less frequently. However, women have been a growing group of offenders and they will spend longer periods in prison. Imprisonment can be a challenge and an opportunity. It stabilizes the health situation after an often chaotic lifestyle outside prison. Advantage should be taken of this time to assess the rehabilitation needs of prisoners and, after their release from prison, the procedures can continue in the public health care services. Good prison health care services can offer better targeted treatments and health screenings than what these women will access in their chaotic lives outside prison. Tackling the mental and physical illnesses of prisoners will improve the state of public health.

It is important to identify the gender differences, and to take them into account in the planning of prison health care services as well other prison functions. The various gender differences and female prisoners’ experiences of abuse emphasize the importance of providing rehabilitation programmes especially designed for women. Female prisoners’ serious substance use problems and common mental disorders especially call for specific treatment methods. The risk behaviour related to IDU and the high rate of HCV infections especially among young females may lead to growing problems in the future. It is important to provide prisoners with continuous education on preventing illnesses and maintaining good health.

7.3 Implications for future studies

The implementation of efficient prisoner treatment and rehabilitation programmes requires up-to-date information on prisoners' health, need for treatment and ability to work. The present study was the first comprehensive health survey of Finnish female prisoners. In future, there will be a need to regularly evaluate the changes in prisoners' health and health-related factors, taking account of the differences of minority groups. In addition to females, there are other growing groups of prisoners, such as foreign prisoners. Prisoners' sentences are generally short and it is important to ascertain how the treatment and rehabilitation procedures started in prison will continue after release in the public health care services.

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Hepatitis A, B, C and HIV infections among Finnish female prisoners – Young females a risk group

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Summary Objectives: Previous prison studies have shown that the female gender is associated with higher hepatitis C prevalence. However, there are few prison studies of gender differences concerning the risk factors of hepatitis C infections. We studied the prevalence of hepatitis and HIV infections and the risk factors among Finnish female prisoners.

Methods: The material consisted of 88 females and 300 male prisoners as controls.

Results: The prevalence of hepatitis C virus antibodies was 52%, hepatitis B surface antigen 0%, hepatitis A virus antibodies 38% and HIV antibodies 1% among women, and 44%, 0.7%, 4% and 0.7% respectively among men. Among women, 71% of the age group 16–24 had HCV. There was no significant association between gender and HCV. Women were more commonly sharing syringes/needles and had unsafe sexual habits. Among women, HCV was associated only with IDU and syringe/needle sharing whereas among men also with tattoos, cumulative years in prison and age.

Conclusions: Especially young females had a high prevalence of HCV. The study showed that the risk factors are differentiated by gender. This should be taken into account when assessing earlier studies which mainly concentrate on men.

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Introduction

In most western countries women are a small but growing minority of prisoners, as is also in Finland (from 3.5% in 1993 to 7% in 2008).¹ Very little is known of the health status of Finnish female prisoners. Prison studies conducted elsewhere show that women often have more health problems than male prisoners and they have many chronic and complex health conditions.² Especially mental disorders, infectious diseases and illicit drug use are common among female inmates.² Female prisoners are more severe drug users and experience more associated problems, according to a study by Holloway and Bennett.³ Female prisoners in the European Union are more likely to inject drugs than male prisoners.⁴ All in all, there are relatively few prison studies on the health-related problems and risk behaviour with a viewpoint on gender.

Intravenous drug use (IDU) presents a high risk for acquiring viral hepatitis and HIV infections among prisoner population^{5–7} and drug users.^{8,9} In Finland, 80% of the intravenous drug users are hepatitis C positive.¹⁰ A recent meta-analysis among prisoners shows that in most studies the prevalence of HCV positivity has been 30–40%.¹¹ An important source of the heterogeneity among prison studies is the diverse proportion of IDU. In the same meta-analysis, female gender was associated with HCV positivity (odds ratio 1.44 compared with men), which is in contrast with observations made from general population where HCV prevalence is usually higher among men.¹¹ In different studies, the prevalence of HCV among female inmates has varied from 11% to 67%.^{6,12,13} The prevalence of HIV among female inmates has varied between 0 and 10% and the prevalence of hepatitis B virus core antigen (HBcAg) between 12 and 56%.^{5–7,12,14,15}

The presence of HCVAb and HBcAb (HBcAg antibody) has been associated with injecting drug use in prison and the number of previous imprisonments among male prisoners.⁶ According to Christensen and co-workers,¹⁶ among male Danish prisoners the duration of injecting drug use, number of imprisonments and injecting in prison were independently and positively associated with the presence of HBV antibodies among intravenous drug users (IDUs). Moreover, among prisoners, hepatitis C infection has been associated with age, tattooing and cumulative time of incarceration.^{11,13,14,17,18} These studies of HCV included both male and female inmates but the majority of subjects were men. Consequently, the results cannot be applied directly to females. In studies among male and female IDUs outside prison age and history of imprisonment were associated with hepatitis C seroconversion¹⁹ and syringe/needle sharing in prison was associated with hepatitis B, hepatitis C and HIV.²⁰

In Finland, the health of female offenders was never before appropriately researched. We had the opportunity to do so in context of a larger prison health survey of Finnish prisoners in 2006. For the first time, the prevalence of viral hepatitis A, B, C and HIV infection and the markers of hepatic disease among Finnish female prisoners and the risk factors of these infections were assessed, and the results compared with those concerning male prisoners.

Materials and methods

Sample

In 2006, a total of 101 Finnish female prisoners participated in the nationally comprehensive prison health survey. It comprised over 40% of female prisoners (the average number of female prisoners in Finland in 2006 was 246, details can be found in the Criminal Sanctions Agency database²¹). The number of foreign female prisoners is low in Finland (in 2006, approx. 4–5%) and they did not enter the study. The Finnish female prisoners came from Hämeenlinna prison and consisted of a sample ($N = 50$) from successively incoming prisoners and a random sample ($N = 51$) of inmates. We compared the results with male prisoners participating in the same survey. The male group consisted of a random sample of inmates from Helsinki and Riihimäki prisons plus a random sample of incoming prisoners from Turku prison, altogether 309 male prisoners. The admitting policies and coverage areas were equal to both women and men. Before starting the field study, the organization responsible of the survey ensured that the samples gathered from these prisons matched the essential socio-demographic and criminological backgrounds of all Finnish prisoners. Totally 22 of the eligible female and 34 of the male prisoners refused to participate in the survey. Due to ethical regulations it was not possible to determine if the socio-demographic background of the refusers differed from those of the participants. Moreover, 11 women and 17 men were unable to take part in the data collection due to a short sentence or a transfer to another institution. The present study consists of prisoners who participated in the laboratory testing; 88 of the total 101 women, and 295–300 of the 309 men. According to the interviewing prison nurses and the diaries kept during data collection there was no systematic reason for refusing the laboratory testing (there were practical reasons, reluctance, apathy e.g.). Data was gathered between October 2005 and October 2007; majority was obtained in 2006.

The study received approval from the Pirkanmaa Hospital District ethical council and from the Ministry of Justice. Participation was voluntary and written informed consent was obtained from all participants. The prisoners were very willing to co-operate even though the process was rather demanding.

Methods

The subjects participated in a comprehensive field study consisting of laboratory tests, several questionnaires, interviews, the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I)²² and a clinical medical examination. The interviews were conducted by informed prison nurses, medical examinations by medical doctors working for the Prison Health Services, and most of the clinical examinations were performed by two of the authors (PV, TW).

In the interview, the respondents were asked e.g. about smoking, intravenous use of drugs, sharing syringes/needles, safe sex habits (e.g. use of condom), and sexual abuse (committed by partner, close relative or other person). The socio-demographic background covered age, marital status,

social class and having own children. The marital status was dichotomised (married or cohabiting/other), social class was determined according to occupation (high, middle, low) and having own children was dichotomised (no/yes). The clinical examination included inspection of tattoos. The diagnosis of alcohol abuse/dependence was based on the SCID-I interview.

The laboratory tests were taken after the clinical interview and they included alanine aminotransferase (S-ALT), gamma glutamyltransferase (S-GT), HBsAg and antibodies to HAV, HCV and HIV. The laboratory analyses used EIA (enzyme immunoassay) and immunoblot methods for hepatitis antibodies. HIVAb testing used Abbott Determine HIV-1/2 test (immunochromatographic qualitative test for HIV-1 and HIV-2 antibodies), and there was no need for confirming tests since no new HIV positive cases were found. S-ALT and S-GT were determined using quantitative methods. Elevated S-ALT for women is >45 U/l and for men >70 U/l. Elevated S-GT is in age ≤ 40 for women >45 U/l and for men >80 U/l, and in age >40 for women >75 U/l and for men >115 U/l (the cut-off levels in the Nordic Countries recommended by the Nordic Reference Interval Project, <http://www.furst.no/norip>). When entering prison, all Finnish prisoners participate in a reception interview conducted by nurses, and the information of vaccination against hepatitis A and B was gathered from these documents. The information concerning the principal offence, number of previous sentences in prison and cumulative years in prison was elicited from the statistics of Prison Administration of Finland.

For the comparison of categorical values, the Pearson's Chi-square test was used: the significance level was $P < 0.05$. Logistic regression method was utilized for multivariate analysis, and the statistical package of SPSS 16.0 was applied for the analyses. In order to find out the effect of risk factors on HCV, we carried out two logistic regression models: in the first model (Model 1) we used age, cumulative years in prison, unsafe sex and sexual abuse as explaining variables, and in the second model (Model 2) IDU, syringe/needle sharing and tattoos. In the final analysis, we utilized the significant variables from these two analyses as explaining variables. We used this method because of the low number of events per variable among the female group.

Results

Characteristics of the participants and the bivariate comparisons between women and men are presented in Table 1. The mean age was 34.9 ± 10.2 SD (standard deviation) years among females, and 33.8 ± 10.4 SD among males ($P = \text{n.s.}$). It was more common for female prisoners to be married or cohabiting, have children and come from a lower social class. The male prisoners had more previous sentences and had spent longer times in prison. The female offenders had experienced sexual abuse, shared syringes/needles and had unsafe sexual habits more commonly than the male prisoners. Intravenous drug use was common among both women and men. In both groups approx. 60% had tattoos.

One female (1.1%) and two males (0.7%) had HIV antibodies, thus the difference was not statistically

significant. They were already aware of their HIV positivity. Two males out of 295 (0.7%), and none of the females, were carrying HBsAg antibodies. Of females, 33/88 (37.5%) and of males 12/296 (4.1%) had HAV antibodies ($P < 0.001$). Of females, 46/88 (52.3%) and of males 130/296 (43.9%) were positive for HCV ($P = \text{n.s.}$). Out of all HCV positive women, 44 (95.7%) already knew of their infection, among men the figure was 118/128 (92.2%). A statistically significant association was found with elevated S-ALT and HCV ($P < 0.001$) and also with elevated S-GT and HCV ($P < 0.001$) among men. Among women, there was significant association only with elevated S-GT and HCV ($P = 0.003$) (Table 2).

Hepatitis C was more common among young women, while among men it was more common in the middle age groups (Table 3). IDU and syringe/needle sharing were

Table 1 Socio-demographic background and risk behaviours among female and male prisoners.

Variable	Women (N = 88) ^a		Men (N = 300) ^a		P
	N	%	N	%	
<i>Age, years</i>					
16–24	17	19.3	54	18.0	0.133
25–34	26	29.5	128	42.7	
35–44	28	31.8	68	22.7	
45–69	17	19.3	50	16.7	
<i>Marital status</i>					
Married or cohabiting	50	56.8	129	43.3	0.025
Other	38	43.2	169	56.7	
<i>Children</i>					
No	29	33.0	140	47.0	0.020
Yes	59	67.0	158	53.0	
<i>Social class</i>					
High	11	13.4	44	15.3	0.003
Middle	28	34.1	151	52.6	
Low	43	52.4	92	32.1	
<i>Sexual abuse</i>					
No	52	59.1	290	96.7	<0.001
Yes	36	40.9	10	3.3	
<i>Previous sentences</i>					
No	26	29.5	59	19.7	0.049
One or more	62	70.5	241	80.3	
<i>Cumulative years in prison</i>					
Under one year	33	39.2	32	10.8	<0.001
One year or more	51	60.7	263	89.2	
<i>Intravenous drug use</i>					
No	32	36.4	128	42.7	0.291
Yes	56	63.6	172	57.3	
<i>Syringe/needle sharing</i>					
No	47	53.4	198	66.0	0.031
Yes	41	46.6	102	34.0	
<i>Safe sex</i>					
Ever	35	39.8	179	59.7	0.001
Never	53	60.2	121	40.3	
<i>Tattoo</i>					
No	36	40.9	128	42.7	0.769
Yes	52	59.1	172	57.3	

^a Due to the missing values, the figure of women varies between 82 and 88 and of men between 287 and 300.

Table 2 The proportions of normal and elevated values of alanine aminotransferase (S-ALT) and gamma glutamyltransferase (S-GT) according to hepatitis C among female and male prisoners.

	Women					Men				
	anti-HCV ^c					anti-HCV				
	Positive (N = 46)		Negative (N = 42)		P	Positive (N = 130)		Negative (N = 166)		P
n	%	n	%	n		%	n	%		
S-ALT ^a										
Normal	30	65.2	33	78.6	0.165	63	48.5	151	91.0	<0.001
Elevated	16	34.8	9	21.4		67	51.5	15	9.0	
S-GT ^b										
Normal	31	67.4	39	92.9	0.003	97	74.6	154	92.8	<0.001
Elevated	15	32.6	3	7.1		33	25.4	12	7.2	

^a Elevated S-ALT for women is >45 U/l and for men >70 U/l (the cut-off levels in the Nordic Countries recommended by the Nordic Reference Interval Project, <http://www.furst.no/norip>).

^b Elevated S-GT is in age ≤40 years for women >45 U/l and for men >80 U/l, and in age >40 years for women >75 U/l and for men >115 U/l (the cut-off levels in the Nordic Countries recommended by the Nordic Reference Interval Project, <http://www.furst.no/norip>).

^c Hepatitis C virus antibodies.

Table 3 Risk behaviours of female and male prisoners by hepatitis C virus (HCV).

Variable	Women ^a					Men ^b				
	anti-HCV					anti-HCV				
	Positive		Negative		P	Positive		Negative		P
n	%	n	%	n		%	n	%		
<i>Age, years</i>										
16–24	12	70.6	5	29.4	0.006	15	27.8	39	72.2	<0.001
25–34	17	65.4	9	34.6		72	57.6	53	42.4	
35–44	14	50.0	14	50.0		29	43.3	38	56.7	
45–69	3	17.6	14	82.4		14	28.0	36	72.0	
<i>IDU</i>										
No	1	3.1	31	96.9	<0.001	7	5.5	120	94.5	<0.001
Yes	45	80.4	11	19.6		123	72.8	46	27.2	
<i>Syringe/needle sharing</i>										
No	9	19.1	38	80.9	<0.001	41	20.9	155	79.1	<0.001
Yes	37	90.2	4	9.8		89	89.0	11	11.0	
<i>Sexual abuse</i>										
No	19	36.5	33	63.5	<0.001	126	44.1	160	55.9	0.799
Yes	27	75.0	9	25.0		4	40.0	6	60.0	
<i>Previous prison sentences</i>										
No	12	46.2	14	53.8	0.457	10	16.9	49	83.1	<0.001
One or more	34	54.8	28	45.2		120	50.6	117	49.4	
<i>Cumulative y in prison</i>										
Under one year	20	60.6	13	39.4	0.298	5	15.6	27	84.4	<0.001
One year or more	25	49.0	26	51.0		125	48.3	134	51.7	
<i>Tattoo</i>										
No	16	44.4	20	55.6	0.221	28	22.4	97	77.6	<0.001
Yes	30	57.7	22	42.3		102	59.6	69	40.4	
<i>Safe sex</i>										
Ever	16	45.7	19	54.3	0.317	88	49.7	89	50.3	0.014
Never	30	56.6	23	43.4		42	35.3	77	64.7	

^a The figure of women varies between 84 and 88.

^b The figure of men varies between 291 and 296.

significantly associated with HCV in both sexes. Only male prisoners had association between hepatitis C virus and previous sentences, cumulative years in prison, tattoos and safe sex. The HCV positive women had more commonly experienced sexual abuse than the HCV negative ones. As risk factors for liver diseases, we analysed alcohol use and smoking. Of HCV positive women 36/46 (78%) and 94/130 (72%) of the HCV positive men had alcohol abuse/dependence diagnosis in the SCID-I interview. Of female prisoners, 90% smoked regularly. Out of women using drugs intravenously, 35/56 (63%) and of IDU men 86/143 (60%) had been vaccinated against hepatitis B (one or more vaccine doses) and of IDU women 26/56 (46%) had received all 3 vaccine doses. Vaccination against hepatitis A had been given to 17/55 (31%) of IDU women and 44/142 (31%) of IDU men.

According to the multivariate analyses (Table 4), among women HCV as outcome variable was positively associated in Model 1 with sexual abuse and age, and in Model 2 with IDU and syringe/needle sharing. In the final analysis among women, HCV was positively associated only with IDU and syringe/needle sharing. Among men, HCV was associated in Model 1 with cumulative years in prison, unsafe sex and age, and in Model 2 with IDU syringe/needle sharing and tattoos. In the final analysis among men, HCV was associated with IDU, syringe/needle sharing, tattoos, cumulative years in prison and age.

Discussion

The main findings of this study were that female prisoners had high prevalence of HCV and intravenous drug use. Compared to men, females were more commonly prone to risk behaviour like syringe/needle sharing and unsafe sexual habits. The risk factors associated with HCV had gender differences. Hepatitis C was especially common among young females, which can cause continuous problems in the future. In both genders, HIV prevalence was on the same level as among Finnish IDUs.

Finnish prisoners had high prevalence of hepatitis C infection and intravenous drug use, and both sexes had significant association between HCV and IDU and syringe/needle sharing. The high HCV prevalence is in accordance with the high prevalence of IDU among Finnish prisoners. Similarly, in general Finnish population about 80% of IDUs are HCV positive.¹⁰ The HCV prevalence among Finnish population has been estimated to be 0.02%, according to WHO report 1999.²³ The study of Muehlberger et al.²⁴ estimated that 1.1–1.3% of people in their 22 European focus countries are infected with HCV. Hepatitis C is a major health problem; it is a leading cause of chronic liver disease, end-stage cirrhosis and liver cancer.²⁵

The meta-analysis by Vescio et al.¹¹ shows that HCV prevalence tends to be higher among female than male prisoners. This result is different from that of the general

Table 4 Hepatitis C and associated risk factors among female and male prisoners (multivariate logistic regression analysis).

	Model 1		Model 2		Final analysis	
	OR(95%CI)	P	OR(95%CI)	P	OR(95%CI)	P
<i>Women</i> ^a						
Age, years						
16–24		0.015				0.498
25–34	0.8 (0.2–3.8)	0.777			0.4 (0.04–4.0)	0.454
35–44	0.3 (0.1–1.2)	0.082			1.1 (0.1–12.7)	0.914
45–69	0.1 (0.01–0.4)	0.005			0.2 (0.02–3.5)	0.291
Cumulative years in prison	0.8 (0.3–2.4)	0.737				
Unsafe sex	2.5 (0.8–7.6)	0.101				
Sexual abuse	5.8 (1.9–17.4)	0.002			1.7 (0.4–7.2)	0.498
IDU			32.2 (3.4–304.1)	0.002	28.5 (2.8–281.0)	0.004
Syringe/needle sharing			9.0 (2.0–40.0)	0.004	10.0 (1.7–58.4)	0.010
Tattoos			1.8 (0.4–7.6)	0.432		
<i>Men</i> ^a						
Age, years						
16–24		<0.001				0.003
25–34	3.9 (1.9–8.2)	<0.001			6.5 (2.4–17.8)	<0.001
35–44	2.1 (0.9–4.6)	0.073			4.7 (1.6–13.8)	0.005
45–69	1.1 (0.4–2.6)	0.863			3.7 (0.96–14.2)	0.058
Cumulative years in prison	6.0 (2.2–16.6)	0.001			5.2 (1.2–22.7)	0.028
Unsafe sex	0.5 (0.3–0.8)	0.004			0.7 (0.3–1.4)	0.301
Sexual abuse	0.6 (0.2–2.5)	0.505				
IDU			12.8 (5.1–32.0)	<0.001	15.1 (5.7–40.4)	<0.001
Syringe/needle sharing			8.7 (3.9–19.6)	<0.001	7.9 (3.2–19.2)	<0.001
Tattoos			2.9 (1.4–6.2)	0.004	2.9 (1.3–6.4)	0.009

Model 1: explaining variables: age, cumulative years in prison, unsafe sex, sexual abuse.

Model 2: explaining variables: intravenous drug use (IDU), syringe/needle sharing, tattoos.

Final analysis: significant variables from Models 1 and 2.

^a Due to missing values, the figure of women varies between 84 and 88 and of men between 295 and 300.

population.¹¹ In Finland we do not have exact HCV prevalence figures of population, but in the past few years the incidence has been approx. 15–30 per 100 000, out of which the ratio for males has constantly been double compared with females, details can be found in the NPHI database.²⁶ In our study, female and male prisoners did not have significant difference in HCV prevalence.

Young females were more commonly HCV positive, whereas in the male group HCV positivity was more common among inmates aged 25–44. In studies conducted in the United States, an association was found to older prisoners, whereas in studies from Italy, Greece and Australia the connection has been U-shaped, as in the male group of the present study.^{5,17,18,27–29} In Finland, during the past few years the tendency of HCV infections has been slowly declining especially in the young (15–19 years) age group.³⁰ In our study, young female inmates had extremely high prevalence of HCV (71%). Among Finnish drug users they might comprise a special subgroup which takes more risk associated to IDU.

It was more common for the females to be first-time prisoners, and they had shorter cumulative time in prison than the males. They had no associations between hepatitis C prevalence and previous sentences and cumulative years in prison, whereas these associations were found among male offenders and in previous studies in other countries.^{5–7,14,17} The quality of female crimes has changed in Finland. At present, violence is the most common crime among both sexes, and the drug offence as a principal offence is also equally common in both groups. Even though women spend less time in prison than men they seem to be more prone to risk behaviour also outside prison when it comes to IDU and other drug related life styles. In our study, the syringe/needle sharing and non-safe sex practices (e.g. no use of condom) were more common among women. Taking into account that, among both sexes, nearly everyone already knew about their HCV infection when entering prison, the tendency towards risk behaviour was alarmingly common.

Tattoos were equally common in both groups, but we could find an association between tattoos and HCV only among men. This might have a connection with male inmates' longer imprisonment time, although the place of tattooing (in or outside prison) was not asked. In the study of Hellard et al.,¹³ tattooing in prison was a risk factor for HCV. The meta-analysis by Vescio et al.¹¹ also indicated an association between tattoos and HCV in prison inmates, even after having taken IDU status into account. In prison, a higher risk of sharing tattooing equipment exists and it is more difficult to obtain sterilising equipment, even though in Finnish prisons disinfectants can be found in common shower rooms, and every prisoner receives a hygiene kit containing disinfectant when entering prison.

Among HCV positive women, many had elevated S-ALT. However, it is noteworthy that also 21% of HCV negative women had elevated S-ALT, whereas men had a significant association between high S-ALT and HCV. One explanation can be that 70% of Finnish female prisoners³¹ are diagnosed with alcohol abuse/dependence and that women are more susceptible to liver damages caused by alcohol. Even higher proportion (78%) of HCV positive females had alcohol abuse/dependence diagnosis, and the combination of alcohol abuse and HCV increases the risk of cirrhosis and hepatocellular

carcinoma. Smoking and especially cannabis use may increase the risk of liver fibrosis in hepatitis C.^{32,33} Of Finnish female prisoners, 90% smoked regularly and 70% had used cannabinoids in their lifetime.³¹ Although the Finnish female prisoners with HCV are young, and young females seem to develop chronic hepatitis C infection less often/more slowly, HCV infection associated with heavy alcohol use and regular smoking makes them high risk patients.^{34,35}

The prevalence of HIV among female and male prisoners was on the same level as is estimated among Finnish IDUs, i.e. 1.4%.³⁶ This is in connection with the high proportion of IDU among prisoners. One feature of the Finnish HIV epidemic is that almost no IDU-associated HIV cases were recorded during the 1980s and in the beginning of the 1990s. In 1998, the situation changed when an outbreak was recorded among IDUs mainly in the Helsinki area. After prevention efforts (Low Threshold Health Service Centers for IDU, rapid testing, injection equipment exchange etc.) were initiated, the outbreak subsided and the prevalence never rose above 5% within Finnish IDUs.

The prevalence of chronic B hepatitis carriers among male prisoners was higher in our study than in general Finnish-born citizens (0.22%).³⁷ Female prisoners may not have much higher prevalence since we did not find any female carriers. In Finland, the targeted hepatitis B vaccination programme for risk groups has been in existence since 1993, and the programme was expanded in 1998. One target group are the intravenous drug users and their permanent sex partners and people living in the same household. According to an evaluation of the programme, over half of IDUs had been vaccinated and new infections among risk groups were clearly limited, which was also partly due to the extended needle exchange programme in Finland.³⁷ In this study, the vaccination figures were at the same level. In the study of Christensen et al.¹⁶ of Danish prisoners from 1996–97, only 2% of IDUs were vaccinated against HBV whereas in the study of Irish prisoners (1998) 62.5% of IDUs had received one or more hepatitis B vaccine doses.³⁸ In a British study, 45% of IDU females had received three vaccine doses.³⁹ Our study showed the same figure among IDU females.

Over one third of the Finnish female offenders had HAV antibodies, at least partly a result from vaccination (A hepatitis vaccination was taken to the targeting vaccination programme in 2005), partly due to the two A hepatitis epidemics among IDUs in Finland in 1994–95 and 2002–03. In our study, it was not possible to explain why male prisoners had such a low prevalence of HAVAb. In the reception interview conducted by prison nurses, 30% of IDU men reported to have received hepatitis A vaccination, but we could obtain information about this interview only from 243/300 (80%) of male prisoners. It can be thus speculated that men may have mixed up the vaccinations for different types of hepatitis, i.e. A and B. Also, women may be more active in health-related issues; getting a vaccination against a known risk. Furthermore, health care personnel may be more active in offering vaccinations for women.

Limitations

Prisoner population and prisons vary greatly from country to country, even within Western Europe. For example, the status of prisoners, the policy of imprisonment and the drug

policy vary between different countries. The prison study results depend not only on the study design but also on the country and the research time.⁴⁰ We could obtain laboratory test results from 88 women, so it was possible to analyze risk factors in their quite small population only. The information concerning vaccination was gathered from reception interviews which were performed by both prison nurses and nurses who were informed of the study. This can affect the quality of the vaccine information. In our study we tested only for the carriers of chronic hepatitis B, not how many had had HBV infection in their lifetime.

Strengths

Our study represents well the population of Finnish female and male prisoners, as we had the opportunity to conduct gender comparison. Quite often in prison studies it is not possible to find results for females because male offenders are the majority. The study was comprehensive and combined different methods.

Conclusions

Finnish women have a different status of imprisonment than men, and there are also some differences in their risk behaviour concerning drug use. Earlier results from studies with only male prisoners cannot be generalized to females. In two decades there has been a total change of the character of Finnish female prisoners: IDU and other drug related life style including changes in the quality of criminality, and yet there remain also marks of the "old Finnish way", e.g. heavy usage of alcohol. Finnish female inmates have reached and are even passing males when it comes to drug use and associated problems. Young female offenders are a special risk group for hepatitis C. The prevention measures which have confined HIV infections among IDUs in Finland seem not to have succeeded in reducing HCV infections among female prisoners. All this characterizes the complexity of their problems and how risky and even chaotic lives female inmates lead outside prison. They present special challenges also for public health care. They spend short times in prison but this period should be taken advantage of: providing education on preventing illnesses and maintaining good health, and organizing drug treatment programmes designed especially for women.

Declaration of interest

None.

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Emerald Article: Childhood maltreatment and mental disorders among Finnish prisoners

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Childhood maltreatment and mental disorders among Finnish prisoners

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Abstract

Purpose – In a health survey of Finnish prisoners in 2006, the authors aimed to study frequency and gender differences in childhood physical and sexual abuse, and the connections of maltreatment in childhood to substance abuse and mental health among female and male prisoners.

Design/methodology/approach – The sample consisted of 101 female prisoners, with 309 male prisoners for comparison. The subjects participated in a comprehensive field study consisting of several questionnaires, interviews, the Structured Clinical Interview for DSM-IV Axis I and II Disorders (SCID I, II) and a clinical medical examination including ICD-10 diagnoses.

Findings – Both forms of abuse were more common among females than males (childhood physical abuse 25 per cent versus 15 per cent and childhood sexual abuse 32 per cent versus 7 per cent). Associations of childhood abuse with substance abuse and mental health were different among males and females. Family integrity was important only for males and in connection with drug dependence and antisocial personality disorder. The gender differences did not concur with those reported in studies on general populations.

Originality/value – This is a part of the first comprehensive health survey of Finnish prisoners.

Keywords Childhood physical abuse, Childhood sexual abuse, Substance abuse, Mental disorders, Prisoners, Mental illness

Paper type Research paper

Introduction

The assessments of the rates of childhood physical abuse (CPA) and sexual abuse (CSA) are influenced by definitions of childhood abuse, research methods and sample characteristics (Pereda *et al.*, 2009). According to a recent review (Pereda *et al.*, 2009) the prevalence rates of CSA ranged from 0 to 53 per cent for women and 0 to 60 per cent for men in studies conducted in 21 countries all over the world. In North American studies the prevalence of CPA has varied between 20 and 26% among general population (Bierer *et al.*, 2003; Chartier *et al.*, 2009). According to a recent study of 15-year-old (school) pupils in Finland, serious physical abuse (kicking, battering) at home had been experienced by 2 per cent and milder physical abuse (spanking) by 10 per cent of pupils. Sexual abuse had been experienced by 7–8 per cent of girls and 2 per cent of boys (Ellonen *et al.*, 2008).

Studies from different countries have shown adverse childhood events (including CSA and CPA) to be associated with later substance abuse problems (Simpson and Miller, 2002), substance dependence (Douglas *et al.*, 2010), drug use/problem drug use (Thornberry *et al.*, 2010) binge alcohol drinking (Shin *et al.*, 2009) as well as smoking and alcohol-related problems (Chartier *et al.*, 2009). Findings from a large national survey of US women suggested that women's experience of CSA may be an important risk factor for later substance use, depression, anxiety and sexual dysfunction (Wilsnack *et al.*, 1997). Several different conditions or disorders have been found to mediate or moderate the relationship

between childhood abuse and substance abuse problems, including post-traumatic stress disorder, depression, general anxiety symptoms and conduct problems (Douglas *et al.*, 2010; Simpson and Miller, 2002).

Only a few studies of this kind deal with prisoners. In prison studies conducted in the US the rates of CPA among female offenders have varied from 39 per cent to 70 per cent and the rates of CSA from 34 per cent to 59 per cent, the highest figures being among offenders in maximum security prisons (Browne *et al.*, 1999; Clements-Nolle *et al.*, 2009; Dembo *et al.*, 2007; McDaniels-Wilson and Belknap, 2008; McNamara and Fields, 2002; Raj *et al.*, 2008; Warren *et al.*, 2002). Moreover, there are few studies on prisoners focusing on the connections between childhood maltreatment and substance abuse and mental health problems. In a study including 107 male and 29 female juveniles, female homicide offenders had higher rates of reported childhood abuse, more serious substance abuse and mental health problems than males (Roe-Sepowitz, 2009). Mullings *et al.* (2004) studied newly incarcerated female prisoners within the Texas prison system 1998-1999. Alcohol dependent women were more likely to have grown up in disorganized family situations, including, e.g. childhood neglect, CPA and CSA. Another study on Texas prisons revealed childhood maltreatment to be more strongly associated with adult depression and substance dependence among female than among male prisoners (McClellan *et al.*, 1997). Methodological and definitional inconsistencies across studies have made it difficult to estimate the rates of CSA and CPA and their connections to later life events. Moreover, the prison study results depend not only on the study design but also on the country and the time of the research. For example, status of prisoners, imprisonment policies and the drug policies vary between countries and societies (Andersen, 2004). Finally, few studies have used standardized psychiatric interviews as a diagnostic instrument.

In the context of a large health survey of Finnish prisoners in 2006, we studied frequency and gender differences in childhood physical and sexual abuse among female and male prisoners, and the connections of childhood maltreatment to substance abuse and mental health problems.

Method

Sample

The sample consisted of 101 Finnish female prisoners participating in a comprehensive prison health survey at national level in 2006. It covered 42 per cent of female prisoners: the average number of female prisoners in Finland in 2006 was 242, details can be found in the Criminal Sanctions Agency database (Blomster *et al.*, 2011). The number of foreign female prisoners is low in Finland (in 2006, approx. 4-5 per cent) and they were not included in the study. The Finnish female prisoners were incarcerated in Hämeenlinna prison and consisted of a sample ($n = 50$) from successively incoming prisoners and a random sample ($n = 51$) of inmates. We compared the results with those on male prisoners participating in the same survey. The male group consisted of a random sample of inmates from Helsinki and Riihimäki prisons plus a random sample of incoming prisoners from Turku prison, altogether 309 male prisoners. The admission policies and coverage areas were the same for women and men. Before starting the field study, the project organization checked that the samples gathered from these prisons matched as regards the essential socio-demographic and criminological backgrounds of all Finnish prisoners. In total 22 of the eligible female and 34 of the eligible male prisoners refused to participate in the survey. Due to the ethical regulations it was not possible to determine if the socio-demographic background of the non-responders differed from those of the participants. Moreover, 11 women and 17 men were unable to take part in data collection due to being released or transferred to another institution. Data collection was between October 2005 and October 2007; the majority of the data was obtained in 2006.

The study received approval from the Pirkanmaa Hospital District ethical council and from the Finnish Ministry of Justice. Participation was voluntary and written informed consent was obtained from all participants. The prisoners were very willing to co-operate.

Methods

The subjects participated in a comprehensive field study consisting of several questionnaires, interviews, the Structured Clinical Interview for DSM-IV Axis I and II Disorders (SCID I, II) (First *et al.*, 1997a; First *et al.*, 1997b) and a clinical medical examination including ICD-10 diagnoses (World Health Organization, 1992). The substance dependence diagnoses were based on the ICD-10 and other psychiatric diagnoses on SCID I and II. The interviews were conducted by experienced prison nurses, the SCID interviews by psychologists trained for the method, and the medical examinations by physicians working for the Prison Health Services; most of the clinical examinations were performed by two of the authors (PV, TW).

In the interviews, the respondents were asked, e.g. about violence victimization; if they had experienced physical abuse at home during their childhood, and if they had had violent sexual contact with an adult when they were under the age of 16. The socio-demographic background covered, e.g. age, out-of-home placement under the age of 15, childhood household (living whole childhood with both parents or not), and social class. For the statistical analyses, we made a new variable labelled broken family, which consisted of those who had not lived their whole childhood with both parents and/or had out-of-home placement under the age of 15. The social class was defined on a nine-level Finnish classification based on the social appreciation of professions (Rauhala, 1966). We made three groups by connecting classes 1-5 (high), 6-7 (middle) and 8-9 (low). The information concerning the main offence and the number of previous prison sentences was elicited from the statistics of Prison Administration of Finland. The materials and methods have been described in detail elsewhere (Viitanen *et al.*, 2011).

The Pearson's Chi-square test was used for the comparison of categorical values. Logistic regression method was used for bivariate analyses. In addition, all the models were also run using age as a possible confounder. *P*-values <0.05 were considered to be statistically significant. The statistical package SPSS 16.0 was used for the analyses.

Results

The mean age was 34.6 ± 10.0 SD (standard deviation) years among female, and 34.1 ± 10.4 SD years among male offenders ($p = n.s.$). Other background factors of the participants and the bivariate comparisons between women and men are presented in Table I. There was no significant difference in out-of-home placement < age 15 between females and males. Childhood without both parents was common in both groups. It was more common for female prisoners to experience childhood physical and sexual abuse, and they belonged to a lower social class more commonly than men. The male prisoners had more previous sentences, but there was no difference between genders in the nature of the main offence.

Alcohol and drug dependence were equally common among female and male prisoners. Borderline personality, mood and anxiety disorders were more common among female prisoners. There was no significant difference in antisocial personality disorder diagnoses between genders (Table II).

Among women, both CPA and CSA were associated with alcohol dependence and borderline personality disorder and CSA with antisocial personality disorder in bivariate logistic regression analysis (Table III). Among men, CPA was associated with drug dependence, borderline personality disorder, mood, and anxiety disorders but CSA only with mood disorder. The male prisoners also showed a connection between broken family and drug dependence and antisocial personality disorder. In both genders, age was negatively associated with drug dependence and antisocial personality disorder. Adjusting for age did not change the results of the logistic regression analyses.

Table I Socio-demographic and criminal backgrounds of female and male prisoners

Variable	Women (n = 101 ^a)		Men (n = 309 ^a)		p
	n	%	n	%	
<i>Out-of-home placement < age 15</i>					0.799
No	75	74.3	224	73.0	
Yes	26	25.7	83	27.0	
<i>Childhood with both parents</i>					0.791
Yes	37	36.6	117	38.1	
No	64	63.4	190	61.9	
<i>Broken family</i>					0.975
No	37	36.6	113	36.8	
Yes	64	63.4	194	63.2	
<i>Childhood physical abuse</i>					0.026
No	75	75.2	263	85.1	
Yes	25	24.8	46	14.9	
<i>Childhood sexual abuse</i>					<0.001
No	69	68.3	286	92.6	
Yes	32	31.7	23	7.4	
<i>Social class</i>					<0.001
High	11	11.6	45	15.3	
Middle	31	32.6	157	53.2	
Low	53	55.8	93	31.5	
<i>Previous prison sentences</i>					0.018
No	31	30.7	60	19.4	
One or more	70	69.3	249	80.6	
<i>Main offence^b</i>					0.068
Property	20	22.2	77	24.9	
Violence	36	40.0	125	40.5	
Driving under the influence	14	15.6	21	6.8	
Other	20	22.2	86	27.8	

Notes: ^aThe figure for women varies 95-101 and for men 295-309 because of missing cases; ^b90 women; Broken family: childhood at home without both parents and/or out-of-home placement < age 15 y

Table II Prevalencies of lifetime substance dependence (ICD-10) and mental disorders (SCID I and II) among female and male prisoners

	Women n = 101	Men n = 309	p
	%	%	
Alcohol dependence	54.5	62.8	0.137
Drug dependence	67.3	66.7	0.903
Borderline personality disorder	23.8	10.0	<0.001
Antisocial personality disorder	58.4	65.1	0.230
Mood disorder	41.6	27.2	0.006
Anxiety disorder	46.5	24.9	<0.001

Discussion

In the present study, childhood physical abuse was more common among women than men whereas in earlier studies the difference between genders has not been so apparent (Bierer *et al.*, 2003; Dembo *et al.*, 2007). This gender difference was also seen in childhood sexual abuse among Finnish prisoners, which is consistent with earlier studies among general populations (Bierer *et al.*, 2003; Hebert *et al.*, 2009; Pereda *et al.*, 2009) and prisoners

Table III Substance dependence and mental disorders explained by childhood adversities among female and male prisoners

	Women (n = 101)			Men (n = 309)		
	OR	95% CI	p	OR	95% CI	p
<i>Alcohol dependence</i>						
Broken family	1.0	0.5-2.3	0.951	1.2	0.7-1.9	0.555
CPA	2.7	1.0-7.2	0.047	1.4	0.7-2.8	0.324
CSA	3.1	1.2-7.6	0.016	1.7	0.7-4.5	0.268
Age	1.0	0.98-1.1	0.431	1.0	0.98-1.0	0.763
<i>Drug dependence</i>						
Broken family	1.4	0.6-3.4	0.401	2.7	1.6-4.4	<0.001
CPA	0.8	0.3-2.1	0.683	2.6	1.2-5.9	0.018
CSA	2.2	0.8-5.8	0.109	1.8	0.7-5.1	0.238
Age	0.9	0.85-0.95	<0.001	0.9	0.90-0.95	<0.001
<i>Borderline personality disorder</i>						
Broken family	2.0	0.7-5.7	0.180	1.5	0.7-3.3	0.346
CPA	3.8	1.4-10.2	0.008	4.5	2.0-10.0	<0.001
CSA	3.5	1.4-9.2	0.009	2.0	0.6-6.3	0.238
Age	1.0	0.96-1.1	0.739	1.0	0.99-1.1	0.148
<i>Antisocial personality disorder</i>						
Broken family	1.9	0.8-4.3	0.132	2.8	1.7-4.6	<0.001
CPA	1.7	0.7-4.5	0.265	1.8	0.9-3.8	0.101
CSA	3.0	1.2-7.6	0.021	2.0	0.7-5.5	0.184
Age	0.96	0.9-1.0	0.049	0.96	0.94-0.98	<0.001
<i>Mood disorder</i>						
Broken family	0.9	0.4-2.0	0.797	0.8	0.5-1.4	0.414
CPA	0.9	0.4-2.3	0.853	1.9	1.0-3.7	0.049
CSA	1.7	0.7-4.0	0.211	2.7	1.1-6.4	0.024
Age	0.99	0.95-1.0	0.684	1.0	0.99-1.04	0.240
<i>Anxiety disorder</i>						
Broken family	2.1	0.9-4.8	0.083	1.3	0.7-2.2	0.362
CPA	1.7	0.7-4.1	0.276	2.5	1.3-4.7	0.007
CSA	2.2	0.9-5.2	0.068	1.7	0.7-4.1	0.273
Age	1.0	0.96-1.04	0.920	0.995	0.97-1.02	0.710

Notes: Bivariate analyses by logistic regression method. Substance dependence diagnoses are according to ICD-10 and mental disorder diagnoses according to SCID I and II; Broken family variable consists of childhood at home without both parents and/or out-of-home placement < age 15 y.; CPA = childhood physical abuse, CSA = childhood sexual abuse

(Dembo *et al.*, 2007). Both forms of abuse were associated with substance abuse and mental disorders, but there were several differences between female and male offenders. Family integrity was significant only for male prisoners and in the connection to drug dependence and antisocial personality disorder.

The reported levels of CPA and CSA among women were quite low in comparison with other prison studies (Browne *et al.*, 1999; Clements-Nolle *et al.*, 2009; Dembo *et al.*, 2007; McDaniels-Wilson and Belknap, 2008; McNamara and Fields, 2002; Raj *et al.*, 2008; Warren *et al.*, 2002). However, methodological inconsistencies make it difficult to compare the results and moreover, the criminological differences between countries affect the results of prison studies.

Among women, both CPA and CSA were associated with alcohol dependence but not with drug dependence. Among men, childhood abuse was not associated with alcohol dependence, whereas CPA was associated with drug dependence. These Finnish prisoners were quite alike as regards prevalence of substance abuse disorders. Although alcohol abuse has increased among Finnish females (National Institute for Health and Welfare, 2010), in general population the diagnosis of alcohol dependence is far more uncommon

among women than men (Pirkola, Isometsa, Suvisaari, Aro, Joukamaa, Poikolainen, Koskinen, Aromaa and Lönnqvist, 2005). Alcohol dependent women may have more lifetime adversities than alcohol dependent men, also among prisoners. In general, women in prison have more health problems and are more marginalized than male prisoners (World Health Organization, Regional Office for Europe, 2009). Earlier studies have reported an association between substance abuse and CPA and CSA (Arellano, 1996; Douglas *et al.*, 2010; Simpson and Miller, 2002; Thornberry *et al.*, 2010; Tucci *et al.*, 2010). Substance abuse has usually included both alcohol and drugs. In the present study, we found no association between drug dependence and childhood abuse among women. Our study provided no explanation for the finding but it shows that alcohol and drug dependent prisoners as a group are not similar to each other. Among women, illegal drug abuse might not be so strongly associated with a history of childhood adversities; it may rather be a habit learned from partner(s). In a study among US young adults, trauma-related risk factors for alcohol and drug abuse differed for men and women (Danielson *et al.*, 2009). In that study, sexual abuse was a common predictor for alcohol and drug abuse in young women, and alternatively, physical abuse and posttraumatic stress disorder were common predictors for alcohol and drug abuse in young men.

Childhood maltreatment has been shown to increase the risk for personality disorders (Carlson *et al.*, 2009; Johnson *et al.*, 1999). In our study, CSA was associated with borderline and antisocial personality disorders in women but not in men, and CPA with borderline personality disorder in both sexes. In a study on male prisoners in England and Wales, prisoners with personality disorders reported adverse childhood experiences and victimization more frequently than those with no personality disorder (Roberts *et al.*, 2008). In that study, some findings among men differed from in our study. CSA in the family was associated with borderline personality disorder, and harsh discipline with antisocial personality disorder. Furthermore, there was also an association with local authority care and borderline and antisocial personality disorder. We found an association between broken family and antisocial personality disorder but not borderline personality disorder. In the study conducted in England and Wales, male prisoners were more selected; they had committed a sexual or a violent offence. In a study among male and female subjects in maximum security hospitals and prisons, an association between antisocial personality and, e.g. parental loss, placement in care and sexual assault was found (Coid, 1999). In another study on early risk factors for serious antisocial behaviour among young adults in the US, negative family environment was identified as a risk factor and different patterns were found for males and females (Pakiz *et al.*, 1997). For females, the predictors were parental divorce and a history of family sexual abuse, whereas for males the predictor was a history of physical abuse.

We found no connection between childhood abuse and mood or anxiety disorders among female offenders. Women prisoners are a highly selected part of the female population. They have experienced many adversities during their lifetime, they come from a low social class, and they have many health problems, including substance abuse and victimization, both in childhood and adulthood (World Health Organization, Regional Office for Europe, 2009). It may be that all these events, not only the childhood events, mediate the symptoms of mood or anxiety disorders. However, in our study there was a significant association between CPA and CSA and mood disorder, and also between CPA and anxiety disorder among male prisoners. Previous non-prison studies have reported connections between childhood abuse and depression or anxiety problems, but few studies have used standardized diagnostic instruments for measuring mental disorders (Chartier *et al.*, 2009; Douglas *et al.*, 2010; Tucci *et al.*, 2010; Wilsnack *et al.*, 1997; Wilson and Widom, 2009).

Among women, no significant association was found between substance dependence or mental disorders and family integrity, but among men poor family integrity was associated with drug dependence and antisocial personality disorder. In earlier research among general population the results have been contrary. Parental divorce has been found to be associated with depression, anxiety and alcohol abuse disorders among females but not among males (Pirkola, Isometsa, Aro, Kestila, Hamalainen, Veijola, Kiviruusu and Lönnqvist, 2005). Also, other researchers have shown that women are more vulnerable to after-effects

from several stressful or traumatic events (Veijola *et al.*, 1998) and that they are more sensitive to the influence of childhood separation than men (Rodgers, 1994). Prisoners are a selected group and female prisoners especially are marginalized in many ways. They may have faced several complex adversities both in childhood and adulthood, which can affect the development of mental disorders and substance abuse problems in adulthood. Among male prisoners, the connection between drug dependence and antisocial personality disorder and family integrity may be due to the fact that after a family break-up children usually remain with their mother and the boys may be more vulnerable when growing up without a father.

Strengths

Our study represents the population of Finnish female and male prisoners well. It was possible to compare the genders. Quite often in prison studies it is not possible to find results for females, because male offenders are in the majority. We also used standardized psychiatric diagnostic instruments.

Limitations

The prison population and prisons are very different from one country to another, even within Western Europe. For example, status of prisoners, imprisonment policy and drug policy vary between countries. The prison study results depend not only on the study design but also on the country and the time of the research (Andersen, 2004). We used only fairly rough indicators of CPA and CSA, not standardized interviews. We were unable to analyse the effects of parental substance abuse or parental mental health.

Conclusions

There were several gender differences between childhood adversities and substance abuse or lifetime mental disorders. Among prisoners, the gender differences differed from the results of general populations. Childhood sexual abuse is well known to be more common among women than men, but for Finnish female prisoners physical abuse has also been a significantly more common experience.

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ORIGINAL ARTICLE

Finnish female prisoners – heavy consumers of health services

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Abstract

Aims: Previous prison studies show that female prisoners often have more health problems than male prisoners do and that they have many chronic health conditions. Few studies have been made among offenders concerning the use of health services, and even fewer concerning physical diseases. We studied the self-reported lifetime somatic diseases, the use of health services and the current use of prescription medicines among Finnish female prisoners and compared them with males. **Methods:** The sample consisted of 101 females and 309 male prisoners as controls. The study included several questionnaires and interviews conducted by experienced prison nurses. **Results:** The women had more commonly genitourinary, virus hepatitis/HIV infections and group “other diseases” than the men. Over 80% of the women and men have had accidents/injuries. Four out of five women, and half of the men, used some medicine regularly. Of the females, 92% (80% of the males) reported lifetime hospital care and 65% (61%) treatment in surgery department, respectively; 70% of the females (53% of the males) reported lifetime use of any psychiatric service; 66% of the women (46% of the men) had received psychiatric out-patient services, and 43% (31%) psychiatric in-patient hospital care and 38% (30%) substance abuse services, respectively. **Conclusions:** The heavy use of health services among female prisoners resulted mainly from the use of services for substance use and other mental disorders and treatment in surgery department. Compared to men, the difference in using health services was associated with psychiatric services.

Key Words: Female, health service, prisoners, service use

Introduction

In most Western countries, women are a small but growing minority of prisoners, as also in Finland (from 3.5 % in 1993 to 7.5% in 2010) [1]. Very little is known of the health status of Finnish female prisoners. Prison studies elsewhere show that women have many chronic health conditions and more health problems than male prisoners do [2–4]. Mental disorders and infectious diseases are more common in prisoners than other people [3], and they are especially common among female inmates [2]. The *Health of Australia's prisoners 2009* report showed that prisoners were in poor health compared to the general community [5] and a nationwide US prisoner survey

concluded that many inmates had a chronic medical condition [6].

Few studies have been conducted among offenders concerning their use of health services and even fewer concerning their physical diseases. In Australia, in 2010, 76% of prison entrants had had consultation with a medical professional during the past 12 months [7]. Among American incarcerated women, urban women reported more use of mental health and substance abuse services than rural prisoners [8]. There are some divergent findings, especially by gender, of receiving mental health services prior to imprisonment. In an US study, only few county jail

inmates reported mental health treatment prior to incarceration, and the only gender difference was that men had received substance abuse treatment more commonly [9]. In another US prisoner study, the majority of women had used substance abuse and/or mental health services, and the rates of service use were higher than for the women in the general community [10]. In a study in the UK, the receipt of mental health services before imprisonment was demographically most strongly associated with being older, white and female [11]. This study concluded that the majority of mental health needs of these prisoners were not attended to prior to imprisonment.

In Finland, the use of health services among female prisoners has never before been appropriately studied. We had that possibility in the context of a large health survey of Finnish prisoners in 2006. We studied the self-reported lifetime somatic diseases, the lifetime use of health services and the present use of prescription medicines among female prisoners and compared them with male prisoners.

Method

Sample

The materials have been described in detail earlier [12]. The sample consisted of 101 Finnish female prisoners participating in a nationally-comprehensive prison health survey in 2006. It comprised 41% of all female prisoners [1]. The number of foreign female prisoners is low in Finland (in 2006, approx. 4–5 %) and they were excluded. The female prisoners consisted of a sample ($N = 50$) from successively incoming prisoners and a random sample ($N = 51$) of inmates. We compared the results with male prisoners participating in the same survey. The male group consisted of a random sample of inmates from two prisons plus a random sample of incoming prisoners from one prison, altogether 309 male prisoners. The admitting policies and coverage areas were equal for women and men. Before starting the field study, the organization of the survey checked that the samples gathered match the essential socio-demographic and criminological backgrounds with all Finnish prisoners. A total of 22 of eligible female and 34 of male prisoners refused to participate. Due to ethical regulations, it was not possible to determine if the socio-demographic background of those who refused differed from those of the participants. Furthermore, 11 women and 17 men were unable to take part due to a short sentence or transfer to another institution. Data was gathered between October 2005 and October 2007.

The study received approval from the Pirkanmaa Hospital District ethical council and from the

Ministry of Justice. Participation was voluntary. A written informed consent was obtained from all participants. The prisoners were very willing to co-operate.

Methods

The subjects participated in a field study consisting of several questionnaires and interviews. The interviews were conducted by experienced and trained prison nurses. First, the subjects filled in the questionnaires and after that, experienced prison nurses interviewed them. The nurses also checked the questionnaires and filled in possible missing information. The questionnaires included nearly 200 items and addressed lifetime somatic diseases and symptoms. Somatic diseases were classified as cardiovascular, respiratory, gastrointestinal, genitourinary, musculoskeletal and skin diseases and accidents/injuries. In addition, there was a separate category for virus hepatitis (A, B, C) and HIV infections. All other diseases and symptoms were included in the category "other" disease (Appendix I). In the interview, the respondents were asked about current regular use of prescription medicines for different diseases, lifetime hospital in-patient care in different departments, use of psychiatric out-patient and in-patient services and special services for substance abuse. The socio-demographic background covered age, marital status, children and social class. The marital status was dichotomized (married or cohabiting/other). The social class was measured on a nine-level Finnish classification based on the social appreciation of professions [13] by combining classes 1–5 (high), 6–7 (middle) and 8–9 (low). The information concerning the number of previous sentences was elicited from the statistics of Prison Administration.

For the comparison of categorical values, the Chi-square and Fischer's exact tests were used when appropriate in the bivariate comparisons. In order to eliminate the effects of possible confounding factors to the gender comparison, a logistic regression model was used adjusted for age and social class if the number of events per variable allowed it. P -values < 0.05 were considered to be statistically significant. The statistical package of SPSS 16.0 was used for the analyses.

Results

The characteristics of the participants and the bivariate comparisons between women and men are presented in Table I. The mean age was 34.6 ± 10.0 SD (standard deviation) years among female, and 34.1 ± 10.4 SD years among male offenders ($p = n.s.$). It was more common for female prisoners to be

married or cohabiting, to have children and to come from a lower social class. The male prisoners had more previous sentences than women.

The self-reported somatic diseases are presented in Table II. At least half of the women had a disease in each disease group. The highest figure was seen in the category of accidents and injuries. In the bivariate and multivariate analyses, the female prisoners reported virus hepatitis/HIV infections, genitourinary and "other" diseases more frequently than men did.

Four out of five women used some prescription medicine regularly. The current regular use of

medicines as a whole and because of respiratory diseases, musculoskeletal diseases, mental disorders, insomnia and other diseases was more common among female inmates (Table III). The difference remained significant in multivariate analyses. Over 90% of females reported lifetime hospital in-patient care, which was more common than among men (Table IV). Two-thirds of women had been treated in surgery department. According to the bivariate analysis, the male prisoners were treated more commonly in oto-rhino-laryngology department, but in the multivariate analysis, the difference vanished. In the bivariate and multivariate analyses, females were

Table I. Socio-demographic background among female and male prisoners.

Variable	Women (N = 101)		Men (N = 309)		p
	n	%	n	%	
Age (years)					0.204
16-24	19	18.8	54	17.5	
25-34	32	31.7	131	42.4	
35-44	32	31.7	71	23.0	
45-69	18	17.8	53	17.2	
Marital status					0.008
married or cohabiting	59	58.4	133	43.3	
other	42	41.6	174	56.7	
Children					0.002
no	34	33.7	145	47.2	
yes	67	66.3	162	52.8	
Social class					<0.001
high	11	11.6	45	15.3	
middle	31	32.6	157	53.2	
low	53	55.8	93	31.5	
Previous sentences					0.018
no	31	30.7	60	19.4	
one or more	70	69.3	249	80.6	

Due to the missing values, the figures of women vary between 95-101 and of men between 295-309.

Table II. Self-reported lifetime somatic diseases among female and male prisoners.

Diseases	Women N = 101	Men N = 309	Bivariate analysis ¹	Adjusted logistic regression analysis ²	OR ³ (95% CI)
	n (%)	n (%)	p	p	
Cardiovascular diseases	49 (48.5)	121 (39.2)	0.098	0.188	
Respiratory diseases	65 (64.4)	198 (64.1)	0.960	0.584	
Virus hepatitis, HIV infections	61 (60.4)	139 (45.0)	0.007	0.012	1.90 (1.15-3.13)
Gastrointestinal diseases	65 (64.4)	174 (56.3)	0.155	0.587	
Genitourinary diseases	81 (80.2)	147 (47.6)	<0.001	<0.001	4.35 (2.48v7.64)
Musculoskeletal diseases	76 (75.3)	208 (67.3)	0.134	0.080	
Skin diseases	50 (49.5)	170 (55.0)	0.335	0.279	
Accidents and injuries	85 (84.2)	249 (80.6)	0.422	0.633	
Other diseases	82 (81.2)	201 (65.1)	0.002	0.002	2.54 (1.40-4.60)

¹Bivariate crosstabulations; p-values from χ^2 tests.

²Multivariate logistic regression analyses adjusted for age and social class.

³Male prisoners were the reference group.

treated more commonly in an “other” department. Among women, this other department was in mostly (96% of cases) obstetric.

Female prisoners had used all psychiatric services more frequently than males (Table V). The multivariate analyses did not change these results. Regarding the use of services for substance abuse, no significant difference was found in the bivariate analysis, but in the multivariate analysis women were more frequent users of these services (OR 1.75 (95 % CI 1.05–2.92)).

Discussion

This was the first time when the use of health services was studied among a representative sample of prisoners of one country and with comprehensive methods. The heavy use of health services among female prisoners resulted mainly from the use of services for substance use and other mental disorders and treatment in surgery department. Compared to male prisoners, the difference in using health services and medication was mainly associated with psychiatric services and mental disorders.

Table III. Current regular use of prescription medicines among female and male prisoners.

	Women <i>N</i> = 101	Men <i>N</i> = 309	Bivariate analysis ¹	Adjusted logistic regression analysis ²	OR ⁴ (95% CI)
	%	%	<i>p</i>	<i>p</i>	
Current use of medicines as a whole	79.2	53.7	<0.001	<0.001	3.10 (1.79–5.40)
Reason for the use of medicine					
Diabetes	2.0	2.3	1.000 ³		
Cardiovascular diseases	14.9	8.5	0.061	0.200	
Respiratory diseases	18.8	5.9	<0.001	0.004	3.00 (1.42–6.31)
Musculoskeletal diseases	11.9	5.5	0.030	0.018	2.79 (1.19–6.53)
Gastrointestinal diseases	9.9	7.8	0.500	0.767	
Genitourinary diseases	0.0	2.0	0.343 ³		
Mental disorders	44.6	23.1	<0.001	<0.001	2.75 (1.65–4.61)
Insomnia	44.6	29.3	0.004	0.012	1.88 (1.15–3.08)
Mental disorder or insomnia	59.4	39.8	0.001	0.001	2.21 (1.36–3.61)
Other disease	39.6	14.6	<0.001	<0.001	3.57 (2.07–6.18)

¹Bivariate cross-tabulations; *p*-values from χ^2 tests.

²Multivariate logistic regression analyses adjusted for age and social class; adjusted logistic regression analyses not performed for Diabetes and Genitourinary diseases because of too few events per variable.

³Fischer's exact test.

⁴Male prisoners were the reference group.

Table IV. Lifetime in-patient hospital care among female and male prisoners because of somatic diseases.

Department	Women <i>N</i> = 101	Men <i>N</i> = 309	Bivariate analysis ¹	Adjusted logistic regression analysis ²	OR ⁴ (95%CI)
	%	%	<i>p</i>	<i>p</i>	
At least in any department	92.1	79.6	0.004	0.011	2.83 (1.27–6.33)
Internal medicine	30.7	24.6	0.226	0.196	
Surgery	65.4	60.5	0.386	0.518	
Ophthalmology	7.9	5.8	0.453	0.442	
Oto-rhino-laryngology	5.0	13.9	0.015	0.057	
Dermatology	5.9	3.9	0.404 ³	0.419	
Gynecology	19.8				
Pulmonology	7.9	7.4	0.875	0.502	
Neurology	8.9	6.5	0.407	0.470	
Other	66.3	13.9	<0.001	<0.001	14.94 (8.25–27.03)

¹Bivariate cross-tabulations; *p*-values from χ^2 tests.

²Multivariate logistic regression analyses adjusted for age and social class.

³Fischer's exact test.

⁴Male prisoners were the reference group.

Table V. Lifetime use of psychiatric services among female and male prisoners.

	Women <i>N</i> = 101	Men <i>N</i> = 309	Bivariate analysis ¹	Adjusted logistic regression analysis ²	OR ³ (95%CI)
	%	%	<i>p</i>	<i>p</i>	
Any psychiatric service	70.3	52.8	0.002	0.002	2.30 (1.37–3.87)
Out-patient services					
Any out-patient service	66.3	45.6	<0.001	<0.001	2.52 (1.52–4.18)
Private general physician	34.7	15.5	<0.001	<0.001	3.05 (1.73–5.40)
Private psychiatry	31.7	8.1	<0.001	<0.001	5.48 (2.89–10.41)
Health centre	50.5	29.5	<0.001	0.001	2.29 (1.40–3.75)
Mental health centre	46.5	20.7	<0.001	<0.001	3.99 (2.36–6.73)
Family counseling centre	14.9	4.9	0.001	0.002	3.78 (1.65–8.68)
Psychiatric out-patient department of hospital	33.7	16.8	<0.001	<0.001	2.88 (1.65–5.01)
Other out-patient services	26.7	11.0	<0.001	0.001	2.80 (1.52–5.16)
Psychiatric in-patient hospital care	42.6	31.4	0.040	0.029	21.74 (1.06–2.85)
Special services for substance abuse	37.6	29.8	0.141	0.033	1.75 (1.05–2.92)

¹Bivariate cross-tabulations; *p*-values from χ^2 tests.

²Multivariate logistic regression analyses adjusted for age and social class.

³Male prisoners were the reference group.

The self-reported diseases were common in both genders. Among women, compared to men, higher figures of virus hepatitis/HIV infections were detected. Genitourinary diseases were more common among women. There might be a natural explanation: urinary tract infections. We have earlier shown that hepatitis C infections are frequent among Finnish female inmates in accordance with the high prevalence of intravenous drug users [12]. The category “other diseases” was significantly more common among women. It included e.g. thyroid gland diseases, migraine, headache and anaemia (Appendix I). The extremely high figures of accidents/injuries among both genders show how complicated lives prisoners lead outside prison. In a Finnish prisoner study, 1985 using a similar questionnaire of somatic diseases, men reported significantly more commonly accidents and injuries than women [14].

In our study, gender difference was not found. Half of women reported lifetime cardiovascular and three out of four reported musculoskeletal diseases. The figures for cardiovascular diseases appear quite high compared to studies among the general Finnish population [15,16]. The figures for musculoskeletal diseases are rather similar with those in the general population. In the national Finnish Health Survey 2000, out of the population aged 30–44 years, 75% of women and 79% of men had ever had back pain, and the corresponding proportion for both women and men aged 18–29 years was 68% [15,16]. Respiratory diseases were common in both genders which can partly be connected with heavy smoking

among prisoners [12]. Cardiovascular, respiratory and musculoskeletal diseases included many chronic conditions. Other studies have also shown that prisoners often have multiple chronic health problems [2,3,6,7,17,18] and chronic conditions seem to be more prevalent among female prisoners [2,17,19]. The terms chronic conditions can include not only physical diseases but also mental disorders, thus making comparison of the results difficult. The comparison with the physical morbidity of the general population is also difficult considering the different age and social class distribution of the prisoners.

Despite their young age, the current regular use of medicines was high among female prisoners and more frequent than among male prisoners. Among Finnish prisoners, the regular use of medicines has doubled in 20 years [14]. In 1985, 36% of women and 22% of men reported regular use of prescription medicine. The use of prescription medicines is common and has increased also among the Finnish population [15]. Furthermore, there is a significant gender difference among the adult general population. In the Finnish Health Survey 2000, 69% of females and 46% of males used prescription medicine at the time [20]. An Irish prisoner study also showed similar gender difference and high medication of female prisoners; 74% of the females and 29% of the males reported regular prescription medication [19]. Other studies, mainly among men, have showed lower figures [6,7]. In a US prisoner survey, more than one in five inmates were using prescription medication [6]. In Australia, 40% of all

prisoners were taking prescribed medication and 16% of prison entrants were on mental health medication [7]. In our study, women had significantly more commonly medication for respiratory, musculoskeletal and mental diseases, insomnia and group “other” disease. Except for respiratory and musculoskeletal diseases, this is in accordance with the frequency of these diseases. The high use of respiratory medicines might be connected to the fact that 90% of female prisoners smoke regularly and 70% has used cannabinoids in their lifetime [12,21]. The use of medication for mental disorders and insomnia was especially high among female prisoners. However in both genders, it was tenfold compared with the general population. In the adult Finnish population, 4% of women and 2% of men reported current medication for mental health problems [20]. Also, among the general population, e.g. use of antidepressants has increased almost tenfold during the last 15 years [22]. In the Irish prison study, the female preponderance was also seen in the use of drugs for mental disorders and insomnia, but, on the other hand, not in the use of respiratory medication or analgesics [19]. Substance abuse is very common among Finnish prisoners [21] and we can assume that some part of medication is linked to the misuse of medicines, such as analgesics and benzodiazepines.

The gender difference found considering hospital in-patient care was connected to the care in “other” department. The other department was mainly obstetric. Two out of three women had been treated in surgery department – this is not surprising since 84% of female prisoners have had accidents or injuries during lifetime. Treatment in an internal medicine department can be connected with acute symptoms and diseases such as infections, liver and heart problems. We have some figures of hospital care from general Finnish population. Among the adult population, 40% of women and 34% of men had been in hospital care during the last five years [20]. We have very few studies among prisoners. In the Finnish prisoner study in 1985, the figures were somewhat lower than in the present study; 65% of females and 74% of males had been in hospital care for somatic reasons during their lifetime [14]. In an US study among male prisoners, those who suffered from substance abuse and mental health problems had more hospital stays in lifetime than others (86% vs. 60%) [23]. The first figure is near the results of Finnish prisoners. Among another marginalized people group, it was found in Sweden that homeless persons had twice the risk of being hospitalized for physical diseases compared to the general population [24].

The majority of female prisoners had used psychiatric services during their lifetime. Previously in this project, we have found that some personality and

mood and anxiety disorders were common among prisoners and significantly more common among females than males [25]. Substance abuse has increased among Finnish prisoners during the past decades [26], and 84% of female and male prisoners has the diagnosis of lifetime substance dependence [21]. In our study, the use of all psychiatric services was significantly more common among females. The gender difference in the use of services can be seen also among general population, although the figures differ substantially. Among Finnish adults, 7% of the women and 4% of the men had used some mental health service during last 12 months [16]. Of Finnish young people aged 18–29, 17% of females and 7% of males had used mental health services [20]. Worldwide, mental disorders are more common in prisoners than in the general population and more common among women [2,3]. In a US study, 13% of female prison inmates had a history of past psychiatric hospitalization, 14% had past out-patient treatment and 30% had ever been or were queuing for substance abuse treatment [9]. Among women entering a North Carolina prison, 54% had received psychiatric or substance abuse services in their lifetime [10]. The lifetime substance dependence diagnosis is common in both genders among Finnish prisoners [21]. However, women had used substance abuse services more commonly. It can be assumed that women seek help for their problems earlier or they receive services easier than men. The use of psychiatric and substance abuse services of Finnish female prisoners is high when associated with the high frequency of mental disorders but also to the even higher prevalence of abuse problems.

The high use of health services by female prisoners is focused on the services of substance abuse and other mental disorders. Injuries and treatment in surgery department were common among both genders. Although, in the general population, the use of physician services prefers the large-income social class [16], this is, as such, not seen among prisoners. Prisoners have several contacts with health services during their lifetime offering possibilities to treatment, in that way we cannot consider this group as “marginalized”. However, the type of health services used by prisoners inevitably focuses on acute illnesses and emergency room services rather than on long-lasting treatment relations or even preventive services. The high use of regular medicines is in connection with mental disorders but also with high substance abuse and drug dependence problems. Imprisonment often establishes the health situation and good prison health services offer better targeted treatments and health screenings than what the often chaotic life outside prison can provide.

Strengths

Our study represents well the population of Finnish female and male prisoners. Quite often in prison studies, it is not possible to find results for females, because male offenders are in the majority. The prisoners were very willing to co-operate.

Limitations

In questionnaire and also in interview studies, there is a risk of conscious or unconscious misinformation, concealing or lying and misunderstanding questions. We tried to minimize the information bias by training the nurses who interviewed the subjects. The nurses also checked the questionnaires together with the subjects and filled in possible missing information. There is also a possibility to recall bias when asking about e.g. earlier diseases, but it is common in all these kinds of studies. The significance of our results is difficult to estimate because of lack of similar previous female prisoner studies. The prisoners and prisons are very different from one country to another, also within Western Europe. For example, the status of prisoners, the policy of imprisonment and the drug policy vary between countries [27].

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Conflict of interest

The authors declare that there is no conflict of interest.

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Work ability and treatment needs among Finnish female prisoners

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Abstract

Purpose – The purpose of this paper is to assess the work ability and employment history of Finnish female prisoners and their need for treatment.

Design/methodology/approach – The sample consisted of 101 female prisoners, with 309 male prisoners for comparison. The methods included interviews, the Structured Clinical Interview for DSM-IV Axis I, II Disorders and medical examination including ICD-10 diagnoses.

Findings – Among women, 78 per cent were unemployed and only 6 per cent were employed whereas among men, the proportion of those employed was four times greater than for women. Of women, 42 per cent were unable to work; of men 11 per cent. Substance abuse disorders were the most common reason for impaired work ability (over 70 per cent in both genders). Among women, other mental disorders were the second most common reason (39 per cent), somatic diseases caused impairment in 23 per cent. Basic socio-demographic factors were not associated with impaired work ability among women. Violent crime as the present main offence was significantly more common among prisoners with limited working capacity. Need for treatment was found in 94 per cent of women and 90 per cent of men. In both genders, the majority of treatment needs were for mental disorders. Finnish female prisoners have serious problems with substance abuse, of both alcohol and drugs, which impairs their work ability, employability and is the cause of their need for treatment. In addition, female prisoners have other mental disorders commonly complicating their situation.

Originality/value – This paper is a part of the first comprehensive health study of Finnish female prisoners.

Keywords Finland, Prisons, Women, Employment, Females, Prisoners, Treatment, Work ability

Paper type Research paper

Introduction

Prisoners are in many ways a marginalized section of the population with many health problems including mental disorders, substance abuse, infections and high mortality (Fazel and Benning, 2005; Fazel and Baillargeon, 2011; Joukamaa, 1998; Sailas *et al.*, 2005). Prison studies elsewhere show that poor health and various diseases are especially common among female inmates (Binswanger *et al.*, 2010; World Health Organization, Regional Office for Europe, 2009). The use of health care services among prisoners, particularly among females, is more common than among the general population (Australian Institute of Health and Welfare, 2011; Feron *et al.*, 2005; Marshall *et al.*, 2001) indicating their need for treatment during imprisonment. In a German prison study, a specific need for psychiatric treatment was found in 83 percent of prisoners (von Schonfeld *et al.*, 2006). Health is one of the most important determinants of work ability (Gould *et al.*, 2008). Very little is known of the work ability of prisoners. According to an earlier Finnish study, 15 percent of prisoners were unable to work and 42 percent had impaired work ability (Joukamaa, 1992). An Australian study in 2010 found that 13 percent of prison entrants were unable to work due to disability, age or health condition and only 28 percent were working full-time (Australian Institute of Health and Welfare, 2011). The work ability of Finnish female offenders has not so far been appropriately

studied. We had such an opportunity in the context of a large-scale health study of Finnish prisoners in 2006. The aim of our study was to assess the work ability and employment histories of female prisoners and their need for treatment and compare the results with those of male prisoners.

Methods

Sample

The materials and methods have been described in detail elsewhere (Viitanen *et al.*, 2011a). The sample consisted of 101 Finnish female prisoners participating in a comprehensive national prison health survey in 2006. It covered 41 percent of all Finnish female prisoners (Blomster *et al.*, 2011). The number of foreign female prisoners is low in Finland (in 2006, approximately 4-5 percent) and they were excluded. The Finnish female prisoners were incarcerated in Hämeenlinna prison and consisted of a sample ($n = 50$) from successively incoming prisoners and a random sample ($n = 51$) of inmates. We compared the results with those of male prisoners participating in the same survey. The male group consisted of a random sample of inmates from Helsinki and Riihimäki prisons plus a random sample of incoming prisoners from Turku prison, altogether 309 male prisoners. The admission policies and the areas covered were the same for women and men. It was confirmed in advance that the samples were representative of Finnish prisoners in general as regards socio-demographic background and criminal histories. In total, 22 of the eligible female and 34 of the eligible male prisoners refused to participate. Due to the ethical regulations it was not possible to determine if the socio-demographic background of the non-responders differed from those of the participants. Moreover, 11 women and 17 men were unable to take part in the data collection due to being released or transferred to another institution. Data collection was between October 2005 and 2007; the majority of the data was obtained in 2006.

The study received approval from the Pirkanmaa Hospital District ethical committee and from the Finnish Ministry of Justice. Participation was voluntary and written informed consent was obtained from all participants. The prisoners were very willing to co-operate.

Methods

The subjects participated in a comprehensive field study consisting of several questionnaires, interviews, the Structured Clinical Interview for DSM-IV Axis I and II Disorders (SCID I, II) (First *et al.*, 1997a, b) and a clinical medical examination. The diagnoses were based on the *International Statistical Classification of Diseases, 10th Revision* (ICD-10) (World Health Organization, 1992). The interviews were conducted by experienced prison nurses, the SCID interviews by psychologists trained in the use of the method and the medical examinations by physicians working for the Prison Health Services; most of them were performed by two of the authors (PV, TW). In the present study, we used the results from the interviews and medical examinations.

In the interviews conducted by prison nurses, the respondents were asked about their employment status before imprisonment, classes, employed, unemployed, out of work because of illness, other (housewife/husband, student, draftee), working experience (at least one long term of employment, at most short employments) and temporary or permanent disability pension or sick leave before imprisonment. The socio-demographic background included age, marital status, social class and vocational education. The marital status was dichotomised (married or cohabiting/other). The social class was defined on a nine-level Finnish classification based on the social appreciation of professions (Rauhala, 1966). We formed three groups by connecting classes 1-5 (high), 6-7 (middle) and 8-9 (low). The vocational education was divided into classes none, maximum two years and over two years' education. The information concerning the number of previous prison sentences and the present main offence was elicited from the statistics of the Prison Administration of Finland. The main offence was dichotomised into violent crime (which carry the longest sentences) and all other crimes.

The experienced prison physicians made the clinical examination and summary including all diagnoses, the assessment of subjects' work ability and reasons for impaired work ability.

If the subject had chronic somatic diseases and/or mental disorders impairing their ability to work, the categories “impaired work ability” or “not able to work” were used according to the degree of the impairment. The reasons for impairment were categorized into three groups: somatic disease, mental disorder and substance abuse disorder. The physicians made an overall assessment of the need and reasons for treatment according to ICD-10 categories. It was possible to assess the work ability of 100 women and 300 men.

Statistical analyses

The χ^2 and Fisher's exact tests were used to test the categorical values in the bivariate comparisons between women and men when appropriate. In order to eliminate the effects of possible confounding factors on the gender comparison of work ability and disease calling for treatment, a logistic regression model was used adjusted for marital status, social class, previous sentences and vocational education. In addition, a logistic regression model adjusted for dichotomised age (16-34/35-69), social class (high or middle/low) and vocational education (yes/no) was used to eliminate the possible effects of these background factors on the ability to work both among women and men. p -value < 0.05 was considered to be statistically significant. The statistical package SPSS 16.0 was used for the analyses.

Results

The characteristics of the participants and the bivariate comparisons between women and men are presented in Table I. The mean age was 34.6 ± 10.0 standard deviation (SD) years among female, and 34.1 ± 10.4 SD years among male offenders ($p = n.s.$). It was more common for female prisoners to be married or cohabiting, to come from a lower social class and to have less vocational education. The male prisoners had more previous sentences than the women prisoners.

The employment status and working history are presented in Table II. Four out of five women were unemployed and only 6 percent were employed. Females were more commonly unemployed and on a temporary disability pension or on sick leave than males. There was no gender difference in the working history; half of both genders had at least one long term

Table I Socio-demographic backgrounds of female and male prisoners

Variable	Women (n = 101)		Men (n = 309)		p
	n	%	n	%	
<i>Age, years</i>					0.204
16-24	19	18.8	54	17.5	
25-34	32	31.7	131	42.4	
35-44	32	31.7	71	23.0	
45-69	18	17.8	53	17.2	
<i>Marital status</i>					0.008
Married or cohabiting	59	58.4	133	43.3	
Other	42	41.6	174	56.7	
<i>Social class</i>					<0.001
High	11	11.6	45	15.3	
Middle	31	32.6	157	53.2	
Low	53	55.8	93	31.5	
<i>Previous sentences</i>					0.018
No	31	30.7	60	19.4	
One or more	70	69.3	249	80.6	
<i>Main offence</i>					0.939
Violent crime	36	40.0	125	40.5	
Other	54	60.0	184	59.5	
<i>Vocational education</i>					0.003
Over two years	15	14.8	58	18.9	
Max. two years	31	30.7	140	45.6	
None	55	54.5	109	35.5	

Note: Due to the missing values, the figure for women vary 90-101 and for men 295-309

Variable	Women (n = 101)		Men (n = 309)		p
	n	%	n	%	
<i>Employment status before imprisonment</i>					
Employed	6	5.9	69	22.5	0.0333
Unemployed	79	78.2	193	62.9	
Out of work because of illness	11	10.9	29	9.4	
Other (housewife/husband, student, draftee)	5	5.0	16	5.2	
<i>Working history</i>					
At least one long term of employment	51	50.5	154	50.2	0.977
At most short employments	50	49.5	153	49.8	
<i>Disability pension or sick leave before imprisonment</i>					
No	81	80.2	271	88.3	0.048
Sick leave	9	8.9	15	4.9	
Temporary disability pension	6	5.9	5	1.6	
Permanent disability pension	5	5.0	16	5.2	
<i>Work ability assessed by a physician^a</i>					
Fully able to work	36	36.0	163	54.3	<0.001
Impaired ability to work	22	22.0	105	35.0	
Unable to work	42	42.0	32	10.7	
<i>Reason for impaired ability or inability to work^b</i>					
Somatic disease ^c	15	23.4	40	28.6	0.443
Mental disorder ^c	25	39.1	36	25.7	0.053
Substance abuse disorder ^c	48	75.0	101	72.1	0.670

Notes: ^aWomen n = 100, men n = 300; ^bwomen n = 64, men n = 137; only with impaired ability or disability; ^cnot mutually exclusive

of employment. According to the physician's assessment, the working capacity of women was significantly poorer than that of men (Table II). The gender difference in work ability remained significant in a multivariate analysis adjusted for marital status, social class, previous sentences and vocational education ($p < 0.001$, odds ratio) 2.61 (95 percent confidence interval 1.55-4.41). Substance abuse disorders were the most common reason for impaired work ability (over 70 percent in both genders). Among women, other mental disorders were the second commonest reason (39 percent) and somatic diseases caused impairment in 23 percent of the females. Among men, somatic diseases and mental disorders were equally common reasons for impaired work ability.

Age, marital status, social class, vocational education and previous sentences were not associated with impaired work ability among women. Violent crime as the present main offence was significantly more common among both genders with limited working capacity (Table III). Among men, the following socio-demographic factors were associated with work ability: age, previous sentences, main offence and marital status.

Almost all subjects were in need of treatment (Table IV). In both genders, most of the need for treatment was due to mental disorders. Among men, most of the mental diagnoses were substance (alcohol or drug) abuse disorders but among women, about half of the diagnoses were other mental disorders. Women more commonly needed treatment for respiratory, musculoskeletal and genitourinary diseases; infectious diseases were most common among men. The gender difference remained significant in a multivariate analysis adjusted for marital status, social class, previous sentences and vocational education. Every fourth woman needed treatment for respiratory diseases, which included lung diseases such as asthma and chronic obstructive pulmonary disease. Among women, most of the musculoskeletal diseases were various back problems. Men needed treatment more commonly for infectious diseases such as skin fungus diseases and hepatitis C. The genitourinary diseases among females were mainly non-infectious genital diseases.

Table III Work ability and socio-demographic factors among female and male prisoners

Variable	Women (n = 100)						Men (n = 300)					
	Work ability				p1	p2	Work ability				p1	p2
	Able to work		Impaired or disabled				Able to work		Impaired or disabled			
n	%	n	%	n	%	n	%	n	%			
Age, years					0.254	0.064					0.003	0.006
16-24	8	42.1	11	57.9			39	72.2	15	27.8		
25-34	14	43.8	18	56.2			68	54.8	56	45.2		
35-44	11	35.5	20	64.5			37	52.9	33	47.1		
45-69	3	16.7	15	83.3			19	36.5	33	63.5		
Previous sentences					0.705						0.043	
No	12	38.7	19	61.3			39	66.1	20	33.9		
One or more	24	34.8	45	65.2			124	51.5	117	48.5		
Main offence ^a					0.031						0.016	
Other	24	44.4	30	55.6			108	60.0	72	40.0		
Violent crime	8	22.2	28	77.8			55	45.8	65	54.2		
Marital status ^b					0.952						0.033	
Married or cohabiting	21	35.6	38	64.4			79	61.2	50	38.8		
Other	14	35.0	26	65.0			82	48.8	86	51.2		
Social class ^c					0.698	0.250					0.277	0.563
High	4	36.4	7	63.6			29	65.9	15	34.1		
Middle	13	41.9	18	58.1			80	52.3	73	47.7		
Low	17	32.7	35	67.3			49	55.1	40	44.9		
Vocational education					0.753	0.203					0.051	0.860
Over two years	6	40.0	9	60.0			38	66.7	19	33.3		
Max. two years	12	40.0	18	60.0			65	47.8	71	52.2		
None	18	32.7	37	67.3			60	56.1	47	43.9		

Notes: ^aWomen n = 90; ^bmen n = 297; ^cmen n = 286; p1, bivariate analysis; p2, multivariate analysis with work ability as dependent variable, adjusted for dichotomised age (16-34/35-69), social class (high or middle/low) and vocational education (yes/no)

Table IV Need for treatment and the diseases according to ICD-10 categories among Finnish female and male prisoners

	Women n = 100		Men n = 300		p
	n	%	n	%	
Need for treatment	94	94.0	270	90.0	0.226
Diseases ^a					
AB infections and parasites	1	1.1	31	11.5	0.002
CD tumours	0	0.0	1	0.4	1.000 ^b
D haematological	1	1.1	0	0.0	0.258 ^b
E endocrinological	7	7.4	22	8.1	0.829
F mental	88	93.6	249	92.2	0.657
G neurological	8	8.5	10	3.7	0.093 ^b
H eye	0	0.0	3	1.1	0.572 ^b
H ear	2	2.1	0	0.0	0.066 ^b
I cardiovascular	11	11.7	24	8.9	0.426
J respiratory	25	26.6	20	7.4	<0.001
K gastrointestinal	5	5.3	10	3.7	0.548 ^b
L skin	8	8.5	23	8.5	0.998
M musculoskeletal	17	18.1	20	7.4	0.003
N genitourinary	8	8.5	5	1.9	0.006 ^b
R symptoms	1	1.1	5	1.9	1.000 ^b
ST accidents, injuries	3	3.2	11	4.1	1.000 ^b

Notes: ^aOnly those who in need of treatment; ^bFisher's exact test

Discussion

As far as we know, this was the first study of work ability and employment among a representative sample of female prisoners in one country. The main findings were that most female prisoners had impaired working ability or were unable to work and the most common reason for this was substance abuse disorders. The working capacity of women was significantly poorer than that of men. In both genders, violent crime was associated with impaired work ability. Only a very small minority of women had been employed before their imprisonment, whereas four times as many men had been employed. Nearly all prisoners were in need of treatment, the vast majority due to mental disorders.

The nearly 80 percent unemployment rate of female prisoners is about ten times that of the Finnish general female population (Statistics of Finland, 2011). The gender difference was also greater among prisoners than in the general population (80 percent of female and 63 percent of male prisoners vs 8.1 and 7.5 percent of general population) (Statistics of Finland, 2011). In a recent Australian report on the health of prisoners, 59 percent of female and 41 percent of male prison entrants were unemployed (Australian Institute of Health and Welfare, 2011). The figures are lower than in our study but show also the gender difference. Generally, unemployment has been related to socio-demographic risk factors such as homelessness, low education, delinquency and to mental health issues (Giles and Le, 2007; Gould *et al.*, 2008; Honkonen *et al.*, 2007; Webster *et al.*, 2007). In our study, female prisoners came from a lower social class and had less vocational education than male prisoners whereas male prisoners had more previous sentences. Some studies show that repeat offenders are less likely to have been employed than first-time offenders (Giles and Le, 2007). In a US study among drug abusers, women had more mental health problems and employment barriers, supporting the notion that the gender difference is mediated by differences in mental health problems (Webster *et al.*, 2007). A national epidemiologic health study (the Health 2000 Study), which was representative of the entire Finnish adult population, showed that in the general population the common mental disorders are less prevalent among the employed than the unemployed and economically inactive (Honkonen *et al.*, 2007). According to the same survey, alcohol-dependent subjects had poorer employment prospects (Honkonen *et al.*, 2007). Finnish prisoners have severe substance abuse problems (Lintonen *et al.*, 2011) and more mental health disorders than the general population (Joukamaa, 1995).

Only a third of female prisoners were fully able to work. This is an alarmingly low figure in a population group with a mean age of 35 years. Over 70 percent of both genders had substance abuse disorder as one reason for impaired work ability. Other studies on this same project have shown that substance abuse (alcohol and drug dependence) has increased among Finnish prisoners in recent decades and that 84 percent of female and male prisoners had a diagnosis of lifetime substance dependence (Lintonen *et al.*, 2011, 2012). The female prisoners were also more prone to risk behaviour particularly in relation to drug related life styles, with young females being overly represented in the risk group (Viitanen *et al.*, 2011a). Female prisoners commonly have other mental disorders (Joukamaa, 1995; Viitanen *et al.*, 2011b). In the Finnish general population, mental disorders were the most common reason for disability pensions granted in 2006 (Finnish Centre for Pensions and Social Insurance Institution of Finland, 2007). Among young Finnish adults, the highest risk factors for limited work ability are unemployment, lack of sufficient basic education and mental problems (Gould *et al.*, 2008). All these three factors are typical characteristics of prisoners and especially of female prisoners. Among Australian prisoners, 19 percent of female and 12 percent of male entrants reported being unable to work due to disability, age or health conditions (Australian Institute of Health and Welfare, 2011). All in all, there are few international studies on prisoners' work capacity.

Most women with limited work ability did not have a temporary or permanent disability pension or sick leave before their imprisonment. This is quite understandable when people with severe substance use problems are concerned. In the general Finnish population, aged 16-54 years, 3.6 percent of women and 4.3 percent of men had a permanent disability pension in 2006 (Finnish Centre for Pensions and Social Insurance Institution of Finland, 2007). These are only slightly lower figures than those in our prisoner sample.

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Age was not associated with work ability among female prisoners. The explanation is probably that substance dependence is more common in young age groups. The difference in the distribution of prisoners' socio-demographic characteristics (e.g. age, social class, education) make it difficult to compare the results with the general population. A history of violent crime was the only background factor associated with poor ability to work among women. Among male prisoners, the associations were different and were more similar to what has been found in other studies (Giles and Le, 2007). Previous sentences were associated with impaired work ability among men, but not among women. One explanation may be that among Finnish female offenders, repeated imprisonment is rare, whereas among men it is common (Hypén, 2004). It has been found that in the general Finnish population, those living with families are the most satisfied with their work ability (Gould *et al.*, 2008); in the present study, married or cohabiting men had better ability to work than other men. As for the female offenders, it is possible that other factors, such as high unemployment and mental health problems, impair their work ability more than the usual socio-demographic factors. Common features for violent Finnish females and males include early disadvantaged life and substance abuse (Putkonen, 2011). In a Finnish study, the risk factors for females' violence were previous criminality, personality disorder, substance abuse alone or associated with other mental and psychotic disorders (Putkonen *et al.*, 2001). The reasons for impaired work ability among violent female offenders may be the high prevalence of substance abuse and mental health problems.

Nearly all the prisoners were in need of medical treatment and over 90 percent of both genders were in need of mental health treatment. The need for substance abuse treatment services was substantial among prisoners. In addition, female prisoners were clearly in greater need of treatment for other mental disorders than males. Compared to the first Finnish health study of prisoners in 1985, the need for treatment had increased, especially in relation to mental health disorders (Joukamaa, 1992). In the Health Study conducted among the general population in 2000, 37 percent of women and 27 percent of men in the age group 30-64 years were in need of medical attention because of chronic disease (Aromaa and Koskinen, 2004). The high figures among prisoners set challenges, in terms of the arrangement of adequate services, not only for the prison health care system but also for the public health care system.

There are many factors, both individual and societal (e.g. the labour market, employers' attitudes) affecting the employment of prisoners in various ways, but health issues, especially mental health and substance abuse, are of crucial importance. Finnish female prisoners have serious problems with substance abuse, including both alcohol and drug abuse, which impairs their work ability, employment prospects and is the cause of their need for treatment. In addition, female prisoners commonly have other mental disorders complicating their situation. The substance abuse problems affecting ability to work, however, are amenable to rehabilitation. Prisoners spend short periods in prison and females less frequently re-offend. The imprisonment stabilizes the health situation after an often chaotic lifestyle outside prison. We can take advantage of this time to assess the rehabilitation needs of prisoners. It is important to ensure that after release from prison the treatment and rehabilitation procedures that were initiated during incarceration are continued by public health services.

Up-to-date information and regular evaluation of the health issues and work ability of prisoners is needed for the implementation of efficient treatment and rehabilitation programmes. In this process, the special needs of minority groups, such as females, should be considered.

Strengths

Our study represents the population of Finnish female and male prisoners well. It was possible to compare the genders. In most prison studies, it is not possible to find results for females, because male offenders are in the majority.

Limitations

The prison population and prisons are different across Europe and internationally. For example, the status of prisoners, imprisonment policy and drug policy vary between countries (Andersen, 2004). Therefore, comparison with different prison studies is difficult.

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