JYU DISSERTATIONS 421

Heli Siltala

Family Violence as a Public Health Problem

Effects and Costs in Finnish Health Care

UNIVERSITY OF JYVÄSKYLÄ
FACULTY OF EDUCATION AND PSYCHOLOGY

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ABSTRACT

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The aim of this study was to provide more information on the long-term health effects of family violence on victims and the costs to health services of treating victims. This is the first longitudinal study conducted on the topic in Finland. It is also the first study to directly compare the health effects and costs of treating different types of interpersonal violence. The study also provides new information on Finnish health care professionals' experiences of family violence. The study data comprise two separate data sets gathered in collaboration with the Central Finland Health Care District. The first data set was collected from employees of the Central Finland Health Care District using a cross-sectional wellbeing questionnaire (N = 1 952). The second data set comprised emergency care patients who had been identified as having experienced family, sexual or other interpersonal violence (N = 345) and whose health care use and costs were analysed two years before and two years after their identification date. Data were analysed using chi-square test for independence (crosstabs), one-way analysis of variance, Kruskal-Wallis test, confirmatory factor analysis, multinomial logistic regression analysis, correlation analyses with the Kendall's Tau correlation coefficient, and structural equation modeling. The results showed that the health care costs of family violence victims had already exceeded the level of the general population 1.5 years before their identification in emergency care and further increased towards the identification date. These results indicate that the earlier identification of family violence in health care settings could significantly reduce both the associated health problems and the financial burden it places on health care services. Family violence was found to be common among a sample of health care professionals, and was significantly associated with impaired mental health and well-being. Hence, occupational health care services catering to health care professionals should also be better aware of family violence and able to offer active support to victims. This study demonstrates that family violence is a significant public health problem in Finland that affects individuals, institutions, and society. Thus, more resources should be dedicated to addressing family violence in health care services.

Keywords: Family violence, interpersonal violence, health care use, health care costs, quantitative research

TIIVISTELMÄ (ABSTRACT IN FINNISH)

Siltala, Heli
Lähisuhdeväkivalta kansanterveydellisenä ongelmana: Vaikutukset ja kustannukset suomalaisessa terveydenhuollossa
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Tutkimuksen tavoitteena oli tuottaa lisätietoa lähisuhdeväkivallan pitkäaikaisista terveysvaikutuksista ja -kustannuksista. Tämä oli ensimmäinen aihetta kartoittava suomalainen pitkittäistutkimus sekä ensimmäinen eri väkivaltatyyppien terveyshaittoja ja kustannuksia vertaileva tutkimus. Tutkimus tarjosi myös uutta tietoa terveydenhuollon ammattilaisten kokemasta lähisuhdeväkivallasta. Tutkimus pohjautui kahteen Keski-Suomen sairaanhoitopiirissä kerättyyn aineistoon. Näistä ensimmäinen muodostui sairaanhoitopiirin henkilöstöltä kerätystä hyvinvointikyselystä (N = 1 952). Toinen tutkimusaineisto koostui puolestaan lähisuhdeväkivallan, seksuaalisen väkivallan tai muun väkivallan uhreiksi tunnistetuista päivystyspolin potilaista (N = 345), joiden terveyspalveluiden käyttöä ja kustannuksia kartoitettiin kaksi vuotta ennen ja kaksi vuotta jälkeen tunnistamisen. Aineistojen analysoinnissa hyödynnettiin ristiintaulukointia (khiin neliö –testi), yksisuuntaista varianssianalyysia, Kruskal-Wallisin testiä, konfirmatorista faktorianalyysia, multinomiaalista logisistista regressiota, korrelaatioiden tarkastelua Kendallin järjestyskorrelaatiokertoimen avulla sekä rakenneyhtälömallinnusta. Tulokset osoittivat, että lähisuhdeväkivaltakokemuksiin liittyi merkittäviä fyysisiä ja psyykkisiä terveyshaittoja verrattuna sekä väkivaltaa kokemattomiin henkilöihin että muun tyyppisen väkivallan uhreihin. Lähisuhdeväkivallan uhrien terveyskustannukset ylittivät väestön keskiarvon jo 1.5 vuotta ennen heidän tunnistamistaan päivystyksessä ja kustannukset kasvoivat aina tunnistusajankohtaan saakka. Näiden tulosten perusteella lähisuhdeväkivallan aikaisempi tunnistaminen voisi merkittävästi vähentää sekä uhrien terveyshaittoja että hoitojärjestelmille aiheutuvia kustannuksia. Tutkimuksessa havaittiin myös, että lähisuhdeväkivaltakokemukset olivat yleisiä suomalaisten terveydenhuollon ammattilaisten keskuudessa ja että niillä oli merkitsevä yhteys työntekijöiden heikentyneeseen mielenterveyteen ja hyvinvointiin. Lähisuhdeväkivalta tulisikin huomioida nykyistä paremmin myös työterveyshuollossa ja terveydenhuollon ammattilaisille tulisi tarjota aktiivisesti tukea asian suhteen. Tutkimus osoittaa, että lähisuhdeväkivalta on merkittävä kansanterveysongelma, joka vaikuttaa niin suomalaisiin yksilöihin, instituutioihin kuin yhteiskuntaankin. Tämän vuoksi terveydenhuollossa tulisi kohdentaa nykyistä enemmän resursseja lähisuhdeväkivallan vastaiseen työhön.

Avainsanat: Lähisuhdeväkivalta, ihmisten välinen väkivalta, terveyspalveluiden käyttö, terveydenhuollon kustannukset, määrällinen tutkimus

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The first person I want to thank is my supervisor Juha Holma, who has had a crucial role at every step of my research journey, from my bachelor's thesis onwards. Despite his various academic duties and responsibilities, Juha has always had time for me and has made me feel that for him my work was a priority. Juha's family violence research and intervention lifework can only be admired, and I am proud to have had the opportunity to follow in his footsteps. I could not have wished for a better mentor. I have also been fortunate in having two other excellent supervisors, Marita Husso and Saija Mauno, whose valuable comments and insightful discussions have been important in steering my research and writing. I would also like to thank Gene Feder and Eija Paavilainen for reviewing my dissertation. Their expert comments helped me improve the final version of this work. I am also grateful to my co-authors Maria Hallman and Anneli Kuusinen-Laukkala, who were responsible for collecting the data sets that I used in this research. Without their work and interest in family violence, this dissertation would not have been possible.

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Oulu, 5.8.2021
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LIST OF ORIGINAL PUBLICATIONS

I Siltala, H. P., Holma, J. M., & Hallman, M. (2019). Family violence and mental health in a sample of Finnish health care professionals: The mediating role of perceived sleep quality. *Scandinavian Journal of Caring Sciences*, *33*(1), 231-243.

II Siltala, H. P., Kuusinen-Laukkala, A., & Holma, J. M. (2020). Victims of family violence identified in emergency care: Comparisons of mental health and somatic diagnoses with other victims of interpersonal violence by a retrospective chart review. *Preventive Medicine Reports*, *19*, 101136.

III Siltala, H. P., Kuusinen-Laukkala, A., & Holma, J. M. (2020). Health care use and costs resulting from interpersonal violence: A retrospective chart review. Submitted manuscript.

Taking into account the instructions given and comments made by the co-authors, the author of the present thesis was responsible formulating the research questions, conducting literature reviews, analysing the data and writing the final research reports. Thus, the author was also the main author of the three publications.

FIGURE

TABLE

CONTENTS

1 INTRODUCTION

In this dissertation, I chose to study the long-term health effects of family violence and the financial burden it places on health care services. This dissertation comprises three independent articles in addition to this summary. In the first section of this summary, I introduce the scope, protocol, and rationale of the study and the key terminology used. In the second section, I review the literature on family violence in relation to health care services. In sections three and four, I present the research questions and methodology of the study. In section five, I provide a summary of the results and, finally, in section six, I discuss the implications of the findings for both general practice and further research.

1.1 Course and scope of the present study

Because I identify as a social scientist, I shall begin by briefly describing my personal stance on the research topic, namely family violence. I first gained acquaintance with this research domain in 2012, when I started planning my bachelor's thesis. Family violence was the topic that spoke most loudly to me out of all the research possibilities offered in our psychology department. I was minoring in gender studies, and family violence research allowed me to integrate my interest in feminism and other socio-political issues with my psychology studies. I have followed this research path ever since, from my master's thesis to my doctoral studies. I have found family violence a rewarding research topic and working on it has given me a strong sense of purpose in the academic world. I hope that the importance I attribute to this research topic is also conveyed to the reader.

I started my doctoral studies in 2015. My three supervisors, Professor Juha Holma, Associate Professor Marita Husso and Professor Saija Mauno, helped me to plan and formulate my research topic. During this six-year research project, I was responsible for framing the research questions, conducting literature reviews, analyzing the data and writing the final research reports. The three journal

articles were written by me and my three co-authors: Professor Holma, Licentiate Maria Hallman and Dr Anneli Kuusinen-Laukkala. Professor Holma acted as the main supervisor of my doctoral studies and provided valuable comments on my plans for the research questions and data analysis. He also provided feedback during all phases of the writing process, including all three manuscripts and this final summary section. Licentiate Hallman and Dr Kuusinen-Laukkala were responsible for collecting the two original data sets on which this research project is based. In addition, comments and suggestions provided by my two other supervisors, Associate Professor Husso and Professor Mauno, advised me on writing this summary section. The final version of the summary was also influenced by editorial comments provided by my two reviewers, Professor Eija Paavilainen and Professor Gene Feder.

My own and my supervisors' and co-authors' academic histories and affiliations reflect the interdisciplinary nature of violence studies. This is also manifested in the scope of this dissertation, which theory-wise lies at the intersection of psychology, social science, health science and medical research. Family violence is a complex problem and the factors related to violence are distributed on the individual, situational, communal, and societal levels (Heise, 1998; Krug et al., 2002). To reduce family violence requires attention to, and measures targeted at, all these ecological factors. Thus, I examine the phenomenon at the individual, institutional and societal levels. At the individual level, I examine the effects of family violence on the health and well-being of its victims. At the institutional level, my focus is on how family violence is recognized and dealt with in health care services. Finally, at the societal level, I examine the health care costs associated with family violence. The human rights perspective is a crucial element and informs all levels of the study. In exploring the health effects and costs associated with family violence, I highlight why health care services need to address this problem more effectively. My main argument is that family violence should be regarded as a public health issue and that more efficient interventions could significantly decrease both the personal and societal costs resulting from family violence. I believe that the findings of this study on the health effects and costs of family violence will benefit health care professionals, service providers and policy makers and help them to plan and implement more effective means of preventing family violence.

1.2 The current state of affairs

For millions of people worldwide, the family is not the source of safety and support it ought to be; instead, they experience violence and abuse by their loved ones. For victims, this is a personal tragedy and for societies and states it reflects an inability to keep their citizens safe from harm. In Finland, various NGOs and researchers have sought to increase awareness of family violence since the 1990s. Several legislative and policy initiatives have since been made, one of the most recent being the decision in 2015 that the Finnish state take responsibility for the

funding of shelters intended to protect victims of family violence. In October 2020, the Finnish government, led by the prime minister, Sanna Marin, announced a program for reducing violence against women, a justice and safety issue that the government regards as of high importance (Ruuskanen, 2020). These changes in policies go hand-in-hand with the public discourse on violence, which has also grown in the past few years with the #MeToo-movement and stories by survivors of family violence.

Despite these measures, the true significance of the problem is not properly understood in Finland. This neglect is manifest in several areas, such as an insufficient number of shelters and unequal access to services catering for victims and perpetrators of family violence. The United Nations Human Rights Council has regarded violence against women as a major human rights violation in Finland and has made several policy recommendations aimed at reducing violence (United Nations General Assembly, 2017), many of which remain unratified by the Finnish state. Thus, much more must be done to recognize the harm caused by family violence in Finland. To develop more effective policies against violence, the EU has also called for more data on the effects and costs of violence against women (EIGE, 2014). According to the WHO (2016), health care services could play an important role in managing family violence globally. However, it is clear that health care services need more support in order to be able to address these recommendations issued by the UN, EU and WHO.

1.3 Defining and studying family violence

The term 'family violence' used in this dissertation is only one of the many options available in the research literature. For the purpose of this research, family violence refers to abusive behaviors targeted towards the current or previous partner or child of the perpetrator, as defined by the WHO (2002). Common to these forms of violence targeted at family members is that they violate the trust and safety that is essential in healthy intimate relationships. According to Johnson et al. (2001), such severe attachment injuries impose an intense and overwhelming emotional burden on victim(s), which is also likely to be long-lasting and difficult to treat.

Family violence is a form of interpersonal violence that can be physical, psychological, or sexual and includes intimidation and threats (Krug et al., 2002; Miller & McCaw, 2019). No universal definition exists that lists all the possible forms of abuse. Physical abuse includes, but is not restricted to, violent acts such as slapping, kicking, pushing, throwing objects at the victim, and using a weapon. Sexual abuse, in turn, includes rape and other ways of forcing or pressuring another person into sexual acts without their consent. Psychological abuse can appear as intimidation, constant belittling, name-calling, and emotional bullying. Controlling behaviors, such as restricting social contacts, stalking, and economic violence are also a prominent form of psychological violence. Due to the variety of abusive acts, the WHO definition of family violence highlights intentionality

and physical or psychological harm to the victim as its key defining features (Krug et al., 2002).

The diversity of family violence and lack of universally accepted definitions is reflected in the existing research literature, where different terms and samples have been used in discussing the issue, including domestic violence or abuse, intimate partner violence, violence against women and children, battering and violence in close relationships. The majority of the studies cited in the next section have focused on violence between current or previous intimate partners. In this dissertation, I also compare family violence with other forms of interpersonal violence. These forms include sexual violence by non-familial perpetrators and other violence, defined as non-sexual physical violence by a non-familial perpetrator.

2 PREVIOUS RESEARCH

In this section, the prevalence and effects on health of family violence are discussed in more detail. It is important to note that family violence affects people of all ages, genders, ethnicity, language, geography, socioeconomic status, sexual orientation, and ability (Krug et al., 2002; Riedl et al., 2019). The aim of this literature review is to provide a comprehensive picture of family violence both globally and in Finland. However, it is important to note that the complexity of family violence poses several limitations for research. Family violence is still a rather young research subject, and the definitions and methods used in researching it are continuing to change, as the phenomenon becomes better understood.

For the purpose of this review, relevant studies were searched from the PsycInfo and PubMed databases. Searches were conducted using several combinations of the following search terms: *domestic/family/partner/intimate partner* + *violence/abuse; IPV; sexual* + *violence/abuse, rape; interpersonal violence, violent crime, violence; health, effects, mental health, outcomes, costs; health/medical/emergency* + *care/services*. For each relevant study identified in the databases, a list of citing studies was also inspected in order to find other potentially relevant studies.

Due to the diversity of the existing research, this literature review is based on meta-analyses, review studies and large (multi-country) population-based studies. However, the more fine-grained the research questions become, the scarcer and more varied are the studies conducted on the subject. Hence, the present review also includes references to individual studies that most closely resemble the present study in terms of the methodology and samples used, i.e., longitudinal studies conducted in high-income countries. Due to the existing research gap, more detailed information on the effects and costs of family violence would be helpful for planning and implementing more effective policies for preventing and reducing family violence.

2.1 Prevalence of family violence

The largest WHO global survey conducted on the family violence concluded that the worldwide prevalence of physical or sexual intimate partner violence against women is around 11-47% (García-Moreno et al., 2013). A more recent survey conducted in the European Union reported that 22% of women have experienced physical and/or sexual violence in their intimate relationships since the age of 15 (FRA, 2014). The same survey reported that the prevalence of violence in Finland was one of the highest among the countries surveyed, with 5% of women reporting recent and 30% lifetime physical or sexual violence by an intimate partner. The experiences of violence reported were diverse and the majority of all the participants reporting abuse had experienced several forms of violence. Population-based surveys published in Finland in 2006 and 2010 reported, in turn, that 16-17% of both women and men have experienced physical violence by their current partner and 42% of women and 22% of men have experienced violence by a previous partner (Heiskanen & Ruuskanen, 2010; Piispa et al., 2006). Psychological family violence is even more common, with a total prevalence of 43% in Europe and 52% in Finland (FRA, 2014).

The total number of homicides has decreased significantly in Finland since the mid- 1990s, but this development is almost exclusively attributable to violence between men while the number of female victims has remained stable across the years (Lehti, 2020). Violence against children has also clearly declined in Finland since corporal punishment was outlawed in 1984 (Fagerlund et al., 2014). Nevertheless, based on earlier prevalence rates, it can be concluded that 70% of Finnish adults have experienced family violence as children (Sariola, 1990). Estimates of the prevalence of family violence have remained practically unchanged over the past decade (Miller & McCaw, 2019), and a recent survey found that 8% of Finnish women had experienced family violence during the past year (Hisasue et al., 2020). There is thus no evidence that family violence between adults is becoming rarer. On the contrary, the first reports on the subject since the onset of the COVID-19 pandemic indicate that it has led to a significant increase in family violence in both Finland and elsewhere (Moreira et al., 2020; Finnish Institute for Health and Welfare (THL), 2020).

Although the total prevalence of violent victimization is similar among Finnish women and men, a significant gender difference exists on the type of violence, with family and sexual violence being experienced mostly by women and other interpersonal violence by men (Heiskanen & Ruuskanen, 2010). This is also reflected in Finnish homicide statistics, which reveal that in 2013-2019, 60% of adult female victims and 8% of male victims had been killed by their current or previous intimate partners (Lehti, 2020). Women are also more often injured and more likely to seek medical care for family violence than men, while men are more likely to seek medical care for other violence (Heiskanen & Ruuskanen, 2010). Similar results on victimization by family, sexual and other violence among women and men have been found elsewhere (Krug et al., 2002; Yau et al.,

2013), clearly demonstrating that experiences of interpersonal violence are gendered. Additionally, specific population groups have been found to be especially vulnerable to family violence. These include various health care populations, such as pregnant women and psychiatric patients (Alhabib et al., 2010). In Finland, the prevalence of recent experiences of family violence has been reported to be 3% in birthing units, 7% in emergency care and 30% in psychiatric care (Notko et al., 2011). Health care providers should thus be aware of the frequency of family violence among their patients, especially women, and be sufficiently trained and prepared to handle the issue.

However, the high prevalence of family violence in Finland clearly demonstrates that the issue is not restricted to specific clinical populations or 'problem clients'. Instead, experiences of abuse are common across the population. Some studies have also examined the prevalence of family violence in specific occupational groups, including health care professionals. The reported life-time prevalence rates among health care professionals have been over 20% in Finland and Sweden (Leppäkoski et al., 2010; Stenson & Heimer, 2008) and 38-70% in other countries (Christofides & Silo, 2005; Janssen et al., 1998; McLindon et al., 2018; Reibling et al., 2020). However, the low number of existing studies and the wide range of reported prevalence rates calls for more research on the subject.

2.2 Health burden of family violence

Family violence is known to have various effects on the health and well-being of victims. To begin with, almost half of all women experiencing violence have been physically injured as a result of the violence (FRA, 2014; García-Moreno et al., 2013). However, acute injuries represent only a small proportion of the health problems associated with family violence. Somatic problems, in turn, include decreased functional and self-reported health, pain (especially in back, head and stomach), psychosomatic symptoms, obstetrical and gynecological issues, sleep problems, memory loss and dizziness (Dillon et al., 2013; Ellsberg et al., 2008; FRA, 2014; Heiskanen & Ruuskanen, 2010; Riedl et al., 2019). Experiences of family violence are also associated with various costly chronic diseases such as asthma, arthritis, stroke, and cardiovascular disease (Miller & McCaw, 2019; Wright et al., 2019). Furthermore, being exposed to family violence can directly restrict victims' access to health care services, which is likely to further impair their health (Ferranti et al., 2018; McCloskey et al., 2007).

Mental health problems are another major issue among victims of family violence, who frequently report suffering from depression, anxiety, and PTSD (Dillon et al., 2013; Riedl et al., 2019). Victims of family violence are also more suicidal and have more substance abuse issues than non-victims (Beydoun et al., 2017; Dillon et al., 2013). In addition to psychiatric diagnoses, mental health symptoms resulting from family violence have been found to be harmful even at the sub-diagnostic level (Rai et al., 2010). The mental health effects of family

violence are especially worrisome, since mental health problems are one of the costliest illnesses to treat and also lead to high disability pension rates. In Finland, the number of pensions resulting from mental health problems have increased significantly in the last decade and since 2018 have been the most common grounds for the awarding of work disability pensions (Kannisto et al., 2019; Mattila-Holappa, 2018). Furthermore, it has been demonstrated that psychological distress is also a significant contributor to disability pensions awarded for somatic illnesses (Rai et al., 2012). Experiences of family violence are typically associated with stigma, shame, and fear (Catallo et al., 2012; Krug et al., 2002). These negative feelings might further increase the mental health effects of family violence (Karakurt et al., 2014) and also explain why only a minority of the victims of violence report having contacted a doctor, the police or other services (FRA, 2014).

Notwithstanding, the various adverse health outcomes of family violence cause victims to use health care services significantly more often than the general population. Estimates varying from an increase of 25% at the population level up to double the rate of service use among help-seeking victims have been reported (Kruse et al., 2011; Rivara et al., 2007; Ulrich et al., 2003). In Finland, the health care costs of family violence have been estimated by Heiskanen and Piispa (2002). Based on data collected from the city of Hämeenlinna in November 2001, they evaluated the annual health care costs resulting from family violence in Finland to be on average € 2 311 per case and 23 million euros in total at the national level (at 2019 values). This equals 0.01% of Finland's GDP, and is in accordance with the lower estimates for the costs of family violence in the US by Brown et al. (2008). However, the previous data collected by Heiskanen and Piispa did not allow estimation of the longitudinal development of health care costs. Accurate cost estimates should include both the short- and long-term health effects of family violence, although for several reasons this is currently difficult to do. For example, victims of family violence suffer from various somatic and mental symptoms, use a range of health care services and do not usually disclose the presence of violence. These challenges are reflected in the variety of measures and methodologies utilized in studies evaluating the health care costs of family violence (EIGE, 2014; Waters et al., 2004; Waters et al., 2005). More research on the topic is thus needed to more comprehensively and accurately evaluate the costs of family violence.

Owing to the high disparity between research settings and methodologies, also only little information is available on how the effects and costs of family violence compare to those resulting from other forms of interpersonal violence (see, e.g., Wickramasekera et al., 2015; Waters et al., 2004; Waters et al., 2005). Interpersonal violence in general has been associated with decreased physical and mental health (Friborg et al., 2015; Krug et al., 2002, Tan & Haining, 2016); however, most of the studies on the subject have either reported prevalence of health effects among different victim groups or compared victims of a specific type of violence to non-victims. Comparisons between different forms of violence have thus been rare. There is an abundance of research evidence on the

associations of experiences of sexual violence with serious mental illnesses, such as depression anxiety and PTSD (Dworkin, 2018). In turn, the most common mental health problem associated with other interpersonal violence is substance abuse (Vaughn et al., 2010). The effects of family and sexual violence seem thus to be similar in this regard and have been noted to be associated with more psychological distress and lower quality of life than other interpersonal violence (Hisasue et al., 2020; Youstin & Siddique, 2019). There is also a significant overlap between family and sexual violence, since the perpetrator of sexual violence is most often a current or previous intimate partner (FRA, 2014).

To my knowledge, no previous studies have directly compared the costs of all three types of violence. It is possible that the various health impairments associated with family violence combined with the high prevalence rates result in higher total health care costs than other forms of interpersonal violence. Family violence is typically long-lasting land thus victims are often subjected to repeated assaults (Farchi et al., 2013; FRA, 2014; Hoelle et al., 2015; Kothari et al., 2014; Krug et al., 2002; Leppäkoski et al., 2011). Compared to the victims of non-familial violence, victims of family violence are also more often injured (FRA, 2014; Heiskanen & Ruuskanen, 2010). Repetitive abuse is especially problematic, as long-lasting family violence has been reported to become more serious with time (Krug et al., 2002; Piispa et al., 2006) and cumulative exposure to violence has been found to increase the likelihood of developing adverse health effects (Dillon et al., 2013; Friborg et al., 2015). Previous studies have demonstrated that the health burden of family violence is likely to persist over several years, although the associated health care costs seem to decrease with time (Fishman et al., 2010; Rivara et al., 2007). The mental health symptoms of violence seem to be especially enduring and significant differences lasting over decades have been reported in comparison to non-victims (Dillon et al., 2013). Similarly, abuse experienced as a child has been noted to have several significant effects on adult health and well-being (Hillis et al., 2017).

The adverse health outcomes of family violence are not restricted to physical abuse. Several studies have reported the health effects of psychological abuse to be even more detrimental (Friborg et al., 2015; Lagdon et al., 2014). The reason for this remains unclear, but the health effects of family violence might be explained by chronic stress activating neuroendocrine and immune system pathways or causing telomere shortening (Miller & McCaw, 2019). Victims of family violence have also been noted to adopt smoking or other substance abuse as a coping strategy, thus further increasing the likelihood of poor health (Beydoun et al., 2017; Miller & McCaw, 2019). However, the exact mechanisms behind these health effects are not known, as research settings have often only analyzed direct correlations between experiences of family violence and health outcomes. More research evidence on the effects of family violence could be helpful in planning more effective interventions for preventing and coping with the adverse health effects of family violence.

2.3 Family violence identification and interventions in health care

While the various health effects of family violence impose a strain on health care services, they also offer possibilities for interventions. The WHO (2016) has proposed that health care services adopt more active role in identifying and intervening in cases of family violence. Research evidence suggests that interventions targeted at family violence are on average more cost-effective than those targeting other forms of interpersonal violence (Waters et al., 2004). Thus, reducing family violence could significantly benefit both individuals and society. The notion that identification helps to reduce the frequency of health care visits and health problems by victims of family violence has been empirically supported (Hoelle et al., 2015; Spangaro, 2017). However, conflicting evidence also exists (O'Doherty et al., 2015) and identification of family violence has been a matter of controversy both in clinical practice and research (Feder, 2016). More research is thus needed to estimate the long-term effects of identification on victims of family violence.

One possible site for identifying victims is emergency care, where 1-8% of patients report that their visit is directly due to family violence (Boyle & Todd, 2003; Kothari et al., 2014; Notko et al., 2011; Parekh et al., 2012; Sethi et al., 2004; Sprague et al., 2014). Additionally, 16-40% of emergency care patients reported having experienced family violence during their lifetime (Bazargan-Hejazi et al., 2014; Hegarty et al., 2013; Notko et al., 2011; Sprague et al., 2014). Similar rates have also been found in Finland, where 7% of patients in emergency care have reported experiencing acute and 20% life-time family violence (Notko et al., 2011). Victims of family violence seek help from emergency care not only for physical injuries but also for various other symptoms, such as infections, obstetrical and gynecological issues, back and stomach problems, chronic pain, mental health issues and substance abuse (Farchi et al., 2013; Hoelle et al., 2015; Zachary et al., 2001). Due to the repetitive nature of family violence, victims typically make several visits to emergency care (Dichter et al., 2018; Hoelle et al., 2015; Rivara et al., 2007), and the number of visits has been found to increase prior to their identification (Hoelle et al., 2015).

Despite its high rates of prevalence and health care use, family violence is systematically under-recognized in health care services (Hinsliff-Smith & McGarry, 2017; Riedl et al., 2019). The difference is clear in comparison to other socially related health problems such as smoking, obesity or alcohol abuse, which health care professionals regularly inquire about and refer for interventions. Several possible reasons exist for the low identification rates of family violence. First, health care professionals seem, falsely, to believe that they are able to identify cases of family violence (Alvarez et al., 2017). As a result, family violence victims are almost exclusively identified based on their physical injuries (Davidov et al., 2015; Donnelly & Holt, 2020; Farchi et al., 2013), meaning that the majority of victims, who present to health care with other issues (Farchi et al.,

2013; Hoelle et al., 2015; Zachary et al., 2001), are likely to remain unidentified. Second, patients seeking medical help owing to family violence might choose not to disclose their abuse, especially if not directly asked about it (Husso et al., 2020; Spangaro, 2017). This might be due to the sense of shame commonly associated with victimization or to the victim being too afraid of the consequences or not trusting health care professionals enough to disclose the violence (Catallo et al., 2012; Hinsliff-Smith & McGarry, 2017; Krug et al., 2002). Victims of family violence might also feel helpless and unable to affect their own situation (Chang et al., 2010; Karakurt et al., 2014). A significant proportion of family violence victims are also either completely unable to recognize their experiences as violence or they minimize the consequences of violence (Catallo et al., 2012; Chang et al., 2010; Donnelly & Holt, 2020).

These issues highlight the need for health care professionals to actively inquire about family violence, even when it does not seem probable to them. The implementation of routine inquiry in health care has been found to triple family violence identification rates (O'Doherty et al., 2015). However, identification itself is not enough, as the abuse disclosed by patients might not be adequately recorded or the information not passed on to other personnel (Dheensa, 2020; Donnelly & Holt, 2020; Kivelä, 2020). Such practices downplay the importance of family violence and reflect serious lack of understanding of the dynamics of family violence. It has also been established that individuals who have been identified as victims of family violence have typically been exposed to serious violence (Hegarty et al., 2013; Leppäkoski et al., 2011; Santas et al., 2020) and are at high risk for future abuse or even death (Brignone & Gomez, 2017; Dheensa, 2020; Zachary et al., 2001). This requires that health care professionals handle each case of family violence with the necessary diligence.

The reluctance of health care professionals to ask about or intervene in cases of violence may be due to inadequate training, lack of resources, unsuitable health care facilities and the fear that patients would object to being asked about family violence (Alvarez et al., 2017; Donnelly & Holt, 2020; Hinsliff-Smith & McGarry, 2017; Husso et al., 2012). Although research has shown that most health care patients have a positive attitude to being asked about family violence (Hinsliff-Smith & McGarry, 2017; Riedl et al., 2019), the constraints concerning training, facilities and organizational support for active inquiry should be addressed, as being asked about family violence can also be a negative experience for victims (Leppäkoski et al., 2011; Hinsliff-Smith & McGarry, 2017). One potential factor that has received little attention is that health care professionals' personal experiences of family violence might affect their willingness to ask about violence or the treatment they provide for their patients (Alvarez et al., 2017; Hinsliff-Smith & McGarry, 2017; Leppäkoski et al., 2010).

Since routine inquiry about family violence has not become popular in health care services, some studies have tried to identify markers for high-risk patients, to whom identification and intervention resources could be targeted. The results have been somewhat inconsistent, but significant predictors for family violence have included previous, non-recent experiences of family

violence, injuries, a higher number of health care visits (especially to emergency care), headache, urinary tract infection, prenatal complications, STDs, HIV concerns, substance abuse and mental health issues (Bhargava et al., 2011; Eaton et al., 2016; Reis et al., 2009; Riedl et al., 2019). These predictors are in line with findings on the effects of family violence and suggest that health care professionals should be aware of the possibility that these issues are linked with experiences of violence. Accordingly, various guidelines have been issued recommending health care professionals to routinely inquire about family violence from several patient groups, such as women seeking help for mental health problems, substance abuse or sexual health concerns and women presenting to reproductive health settings, including pre- and postnatal care (Spangaro, 2017).

3 THE PRESENT STUDY

3.1 Study setting and aims

Family violence has been studied in multiple ways, using both quantitative and qualitative methods. To understand violence requires the use of diverse research methods, since it is a complicated issue that can be approached on different levels and from different disciplinary perspectives, including, psychology, medicine and health sciences, sociology, gender studies, history, philosophy, cultural studies, and economics. The aim of this study was to provide more information on the long-term health effects on victims of family violence and the costs to health services of treating victims, and thereby contribute to the quantitative research tradition in psychology and the health sciences. In addition to descriptive connections between family violence and health, predictive and explanatory relationships between the analyzed variables were also estimated. The major advantage of the chosen approach is that statistical analysis of the associations between experiences of family violence, health, and health care use can produce the measurable statistics that are needed as the basis for policies and interventions concerning family violence. By providing such data, this study demonstrates that family violence is a real problem in health care that is associated with several tangible health effects and related costs. It is evident, as shown in introduction and literature review sections, that the identification of family violence should be improved in health care, as merely treating the associated health symptoms is inadequate if the patient does not receive help for the underlying problem.

3.2 Research questions and hypotheses

The present study sought to answer two research questions:

Q1) How is family violence related to the mental and physical health of victims?

Q2) To what extent are the use and associated financial costs of health care associated with family violence?

The first research question concerns the effects of family violence on the individual level from the viewpoint of victims, whereas the second concerns effects on the institutional and societal levels. The first research question is addressed in **Studies I and II.** In these studies, both the direct and indirect effects of family violence on health and well-being are analyzed. In **Study I**, victims of family violence were compared to non-victims whereas in the **Study II** comparisons were made between family violence and other forms of interpersonal violence. The second research question is addressed by **Study III**, which analyzes health care use and costs among victims of family violence in comparison to other victim groups and the general population. Based on the previous research, the following research hypotheses were formulated for the present study:

H1) Victims of family violence present with more mental and physical health problems than non-victims or victims of non-familial forms of interpersonal violence.

H2) Victims of family violence have higher health care use and generate higher costs than the general population or victims of non-familiar forms of interpersonal violence.

4 METHOD

4.1 Participants and procedure

This research is based on two separate data sets with a combined total of 2 297 individual participants. Both data sets were gathered in collaboration with the Central Finland Health Care District. In 2016, the health care district employed 3 643 professionals and provided specialist health care, emergency care and some social services to a population of 252 651 people, which in Finland makes it a middle-sized health care district. Almost all of the services provided by the health care district are located at the Central Finland Central Hospital in the city of Jyväskylä.

The first data set, utilized in **Study I**, was cross-sectional in nature and all the data were gathered by a questionnaire in 2010. However, structural equation modeling (SEM) was utilized to conduct an analysis on the possible mediation effect of sleep on the other outcome variables measuring mental health. The second data set, utilized in the **Studies II and III**, was longitudinal. Data were gathered during 2011-2014 and an additional retrospective chart analysis covering a four-year period was conducted for each individual participant. The collection and utilization of both data sets were approved by the ethical committee of the Central Finland Health Care District.

4.1.1 Cross-sectional data set

The first data set used in this research was collected in 2010 by a cross-sectional wellbeing questionnaire targeted to employees of the Central Finland Health Care District. The questionnaire was administered electronically to all employees who at the time of the study had an official e-mail address provided by the health care district. In addition to the anonymous web-based questionnaire delivered by e-mail, printed questionnaires were delivered to some workplaces. The total response rate was 54%, resulting in 1 952 participants. Demographic information on the sample is presented in **Study 1**, table 1. In accordance with the

demographic features of the health care district´s employees, the majority of the participants were women and over half were nurses. The majority of the participants were 40-60 years old, had a permanent contract and worked full-time. The goal of the questionnaire was to evaluate the occupational well-being of the participants. The questionnaire included 52 items that measured the health, well-being, and lifestyle of the participants. The items were mainly in multiple-choice format with yes/no or Likert-scale response options. A detailed report on the well-being and health behaviors of the participants was published in 2012 (Ahtiainen, 2012). Family violence was not a specific interest of the original data collection, but one question included in the questionnaire asked whether the participant had experienced physical, sexual, or psychological family violence. These experiences of family violence were not included in the report by Ahtiainen (2012). The data set enabled comparison between participants reporting one or more types of family violence and those with no history of family violence.

4.1.2 Longitudinal data set

The second data set was collected at the emergency department of the Central Finland Central Hospital in 2011-2014. The initial data included information on all patients presenting to emergency care who had been identified and recorded as victims of interpersonal violence, i.e., having experienced either family violence, sexual violence or other interpersonal violence by a non-familial perpetrator. Initially, 518 such patients were identified, but after removing falsely identified cases (n = 120), patients whose medical records were out of reach due to residence in another municipality (n = 22) and children under 16 years of age (n = 31), the final sample contained 345 patients. Their identification visits covered 0.1 % of the total 340 308 visits recorded at the emergency department during the study period. Participants were 16-86 years old (mean (M) = 32.0, standard deviation (SD) = 13.12) and slightly over half of them were women. As can be seen from **Study II**, table 1, almost all the patients identified as victims of family or sexual violence were women, whereas majority of the victims of other violence were men. For the purpose of the present study, additional data were collected in 2016 to gather information on the health and service use of the victims of violence two years before and two years after their identification in emergency care. This retrospective chart review included all visits recorded by public health care providers within the city of Jyväskylä. Comparisons were made between patients experiencing family, sexual, and other violence.

4.2 Measures

Different measures were used in the three studies. The main focus in each study was on the associations between participants' experiences of family violence and their health. Variables extracted from the first data set were self-reported family

violence, sleep quality, and mental health measured by depressive symptoms and psychosocial well-being. Variables extracted from the second data set were based on participants' recorded health care visits and ICD-10 diagnoses (THL, 2011). The variables included experiences of interpersonal violence, all available diagnoses of mental and somatic health, and the use and associated costs of health care services. In the statistical analysis of both data sets, experiences of violence were included as an independent variable. Health measures (**Study I**), service use and costs (**Studies II-III**) were included as dependent variables.

4.2.1 Experiences of family and other violence

The first data set included a measure of self-reported family violence. Participants were asked in the well-being survey if they had ever experienced a) psychological, b) physical, or c) sexual family violence. Three response options were given for each item: "yes", "don't know" and "no". Only the "yes" and "no" answers to each of the three items were included in the statistical analyses. The five most common combinations of violence presented in **Study I**, table 4 were included in the statistical analysis. The second data set, in turn, measured the recorded type of interpersonal violence experienced by patients presenting to emergency care. Based on the date of identification noted in their medical records, participants were labeled as having experienced family violence if the perpetrator was reported to be a spouse, ex-spouse, dating partner, child, parent or other family member of the patient. Two family violence patients reported experiencing sexual violence, one psychological violence and the remainder physical violence. Participants seeking help due to sexual assault by an unknown perpetrator were assigned to the sexual violence group. The remaining participants reporting physical assault by a non-family perpetrator were labeled as having experienced other violence.

4.2.2 Mental and somatic health

Depressive symptoms were measured by three individual items: 1) "During the past two weeks, have you often been bothered by feeling down, depressed, or hopeless?" 2) "During the past two weeks, have you often been bothered by feeling little interest or pleasure in doing things?" and 3) "Do you need help regarding these issues?" All three questions were dichotomous, with yes/no answer options. The first two questions follow the preliminary screening criteria for depression recommended by the current Finnish care guidelines (Duodecim, 2020). For the purpose of this research, participants were labeled as experiencing depressive symptoms if they had answered "yes" to questions 1 or 2 and in addition felt a need for help (question 3). This definition was also used to identify sub-clinical symptoms of depression in a sample that was known to have a relatively high level of well-being (Ahtiainen, 2012). The three items had reasonable internal reliability as indicated by the Cronbach's alpha of 0.70. None of the items could be deleted without lowering the Cronbach's alpha.

General mental health was measured by the Mental Health Continuum Short Form (MHC-SF). The MHC-SF scale developed by Keyes (2009) was used as a measure of general mental health. The internal reliability of the MHC-SF scale has been found to be high (>0.80) and it has been validated in several countries (Keyes, 2009). The MHC-SF comprises 14 items distributed in three clusters of emotional, social, and psychological well-being. The response options for all items are "never", "once or twice", "about once a week", "about 2 or 3 times a week", "almost every day" and "every day". The responses were coded from 0 to 5, respectively. In line with the instructions provided by Keyes (2009), participants were first coded into three categories of mental health: flourishing, moderate and languishing. To be labeled as flourishing, a person must have answered "every day" or "almost every day" to at least one item in the first cluster and to a total of at least six items in the other two clusters. Accordingly, if a person answered "never" or "once or twice" to at least one item in the first cluster and to at least six items in the other two clusters, he/she was labeled as languishing. If the criteria for either of these two categories were not met, the person was labeled as having moderate mental health. Mean scores were also calculated for emotional, social, and psychological well-being by dividing each total cluster score by the number of items in that cluster, resulting in a range of 0.00-5.00. The mean scores and their standard deviations were as follows: emotional well-being (M = 4.00, SD = 0.90), social well-being (M = 3.09, SD = 1.06) and psychological well-being (M = 3.91, SD = 0.86). The mean scores were z-standardized and used as separate outcome variables in the further analyses.

Perceived sleep quality was investigated with seven items each with five Likert-scale response options ranging from "Completely disagree (1)" to "Completely agree (5)". The seven items, Q1-Q7, are displayed in **Study I**, table 2. Cronbach's alpha .87 indicated good internal reliability for these seven items and the alpha value would not have improved from the removal of any one of the items. Confirmatory factor analysis (CFA) was performed using Mplus 8 (Muthén & Muthén, 2012) to validate whether the seven sleep-related items could be condensed into one variable for further analyses. The number of missing data patterns for the CFA was six, resulting in a sample size of 1 946. The initial model, in which only factor loadings, factor variance and residual variances were included, did not show sufficient goodness-of-fit (RMSEA = 0.14, CFI = 0.88, TLI = 0.82 and SRMR = 0.06). Based on the modification indices, covariances between the items were included in the model until a satisfactory model fit was obtained. The six residual covariances included were: Q1 with Q2 & Q3; Q7 with Q5, Q6 & Q3; and Q4 with Q6. The final model showed good fit (RMSEA = 0.59, CFI = 0.99, TLI = 0.97 and SRMR = 0.02). The factor loadings for each item are presented in **Study I**, table 2. The final factor scores were saved and z-standardized to be used as a measure of sleep quality in further analyses.

Mental and somatic health were measured using the ICD-10 diagnoses (THL, 2011) noted in the participants' medical records. Health outcomes were grouped according to the ICD-10 main categories (I-XXII), except for normal childbirth, which was separated from pregnancy with complications, yielding 23

main diagnostic categories for statistical analysis. For the purpose of this research, diagnostic category XXI, which includes medical examinations, contact for counseling and additional codes for socioeconomic and psychosocial concerns, was categorized as "other diagnoses". Mental health diagnoses were first investigated as a single main category and subsequently in more detail by constructing separate variables for all the 11 diagnostic groups F0-F99. Separate variables were also constructed for symptoms and health issues known to be associated with family violence, but which are distributed across several different ICD-10 main categories. These included STDs, nutritional problems, neurological symptoms, sleep disturbances and pain. A dichotomous yes/no coding, indicating whether a participant had experienced each of the health outcomes before or after their identification in emergency care, was used for all diagnostic variables.

4.2.3 Health care use and costs

Health care use was measured by retrieving from the participants' medical records all available health care contacts and visits recorded 24 months before and 24 months after their identification in emergency care. The retrospective chart review thus included health care visits recorded during the period 2009-2016. The data retrieval included visits to all public service providers, including primary health care, specialist health care, nursing homes, dental care, and school health care. Visits to private health care providers and visits in other municipalities were out of reach of the retrospective chart analysis. Although one visit to health care services might have included several recorded "contacts", such as reception by a physician and a laboratory test, it was counted a single visit for the purposes of this study.

Health care costs were calculated based on the rates charged by the Central Finland Health Care District in the patients' home municipalities. Costs were calculated for all health care visits and contacts recorded between 2011-2016 using 2016 rates. If exact rates for each procedure or visit were not available, mean estimates for each service provider and type of visit were used instead. Examples of health care costs are provided in table 1. Exact rates were available for 94.1% of the recorded visits. Total health care costs were calculated for each participant two years before and two years after their identification in emergency care as victims of violence. All recorded contacts and visits were included separately in the analysis to estimate the total sum of all costs generated during the four-year analysis period. Costs allocated on the date of identification were included in the "after" category. In order to compare the development of visits and costs between the different violence groups, total visits and costs in each group were calculated for each week preceding and following the identification date. The number of visits and costs were standardized by dividing the weekly sums by the number of participants in each group.

TABLE 1 Examples of health care costs in the Central Finland Health Care District in 2016

Type of health care visit or procedure	Costs in €
Overnight stay in surgery ward	1157,12
Overnight stay in maternity ward	516,63
Overnight stay in psychiatric ward	453,64
ED visit	645,58
Visit for psychiatric care	161,29
Doctor's appointment in a health care center	117,82
Dental check-up/minor treatment	98,11 (mean)
Visit to the drug replacement and maintenance clinic	79,91 (mean)
Call or letter to patient	68,25
X-ray image	21,98

4.3 Statistical analysis

Statistical analyses were performed using Mplus 8 and SPSS 24 & 25 software. The analytical methods included chi-square test for independence (crosstabs), one-way analysis of variance (ANOVA), Kruskal-Wallis test, confirmatory factor analysis, multinomial logistic regression analysis, correlation analyses with the Kendall's Tau correlation coefficient, and structural equation modeling. The statistical analyses mostly concerned direct relationships between the independent and dependent variables, but mediator models were also used to test the relationships between experiences of family violence, sleep and mental health. The indicator of statistical significance was $p < .05$ in all the statistical analyses. Table 2 provides a summary of the settings, variables, and analysis methods in the three studies.

TABLE 2 Summary of the settings, variables, and analysis methods of the three studies

Study	Study setting	Variables	Analysis methods
I	Cross-sectional Self-report questionnaire	Family violence Depressive symptoms General mental health Emotional well-being Social well-being Psychological well-being Perceived sleep quality	Correlation analysis Crosstabs One-way ANOVA Structural equation modeling Confirmatory factor analysis
II	Longitudinal Chart review	Family violence ICD-10 main categories Mental health problems STDs Nutritional problems Neurological symptoms Sleep disturbances Pain	Crosstabs Kruskal-Wallis test Multinomial logistic regression
III	Longitudinal Chart review	Family violence Sexual violence Other violence Health care use Health care costs	Correlation analysis Kruskal-Wallis test

4.4 Research ethics

Although research on family violence is needed in order to raise awareness of the issue and to improve violence-related services, it is a sensitive research topic that warrants special consideration. The main issues in conducting family violence research concern participant confidentiality and well-being, as questioning people about their experiences of violence can cause them psychological distress or even comprise their physical safety (Ellsberg & Heise, 2002; Paavilainen et al., 2014). In the present study, confidentiality was ensured by the fact that the data used were secondary data collected by the Central Finland Health Care District. The research design involved no further contact with the participants. Both data sets were anonymized before they were handed over by the health care district, and thus no participants were identifiable from the data used in the study.

No additional risk to the well-being of the participants was posed by the second data set, which consisted solely of register data. However, the first data set was based on an online survey in which the participants were directly asked about their experiences of violence. This might have caused distress or other harm to some respondents with a history of family violence. At the end of the survey, participants were encouraged to describe their emotional responses when filling in the survey and to give qualitative feedback on the survey as a whole. While participants were not offered specific support on experiences of

family violence, they were provided with a link to additional occupational health care resources. Some of the participants with a history of family violence might have required additional support after participating in the study (Ellsberg & Heise, 2002; Paavilainen et al., 2014). However, victims of family violence have repeatedly reported positive attitudes towards being asked about their experiences (O'Doherty et al., 2015; Paavilainen et al., 2014; Ramsay et al., 2002). There is no evidence that being asked neutrally about family violence poses harm to victims (O'Doherty et al., 2015; Woerner et al., 2018), many of whom have reported positive outcomes from inquiry into their experiences of family violence (O'Doherty et al., 2015; Paavilainen et al., 2014). Based on these findings, the anonymous survey data utilized in this study is unlikely to have caused the participants serious distress.

The collection and utilization of both data sets were submitted for approval by an independent ethical committee, a procedure that has been recommended when researching family violence (Paavilainen et al., 2014). All the survey participants were volunteers and gave their informed consent to the use of their data for research purposes. The fact that participants were also able to choose when and where to fill in the online survey likely increased the safety and well-being of those at risk of family violence (Paavilainen et al., 2014).

5 RESULTS

5.1 Study I: Family violence, mental health, and sleep quality among health care professionals

The aim of **Study I** was to investigate the prevalence and effects of family violence in a sample of Finnish health care professionals. The study addressed three research questions: 1) How common are experiences of psychological, physical, and sexual family violence among health care professionals? 2) Are family violence experiences significantly associated with mental health outcomes? and 3) Are the possible associations between family violence and mental health mediated by sleep quality?

Overall, the findings demonstrated that family violence is a common issue among Finnish health care professionals, with as many as 38% of the participants reporting having experienced family violence at least once in their lives. Experiences of family violence were also significantly related to the well-being of the health care professionals, participants with a history of family violence consistently scoring worse on all the well-being measures included in the study, i.e. depressive symptoms, the MHC-SF scale and sleep quality. The most significant contributor to these negative effects was psychological abuse, which alone was significantly associated with all the outcome variables used in the study. Additionally, the results demonstrated that the negative associations of psychological abuse on mental health and well-being can, at least partially, be explained by the mediating effect of impaired sleep quality.

Experiences of family violence were significantly more common among women than men ($\chi 2$ (7) = 40.31, $p < .001$), with 40.5% of women (adjusted residual (AR) ≥ 2.0) and 21.3% of men (AR ≤ -2.0) reporting at least some form of abuse. Because the number of men reporting abuse was low, especially in the groups including sexual violence, no further gender comparisons were made. Of all the participants, 18.5% reported having experienced psychological violence only, 12.3% reported having experienced psychological and physical violence and 3.6% reported having experienced all three forms of violence. Physical

violence only was reported by 1.8% of participants and 1.2% reported having experienced both psychological and sexual violence. Sexual violence alone or together with physical violence was reported by less than 0.5% of the participants and thus these two abuse groups were excluded from the further analyses.

The crosstabs showed statistically significant differences between the violence groups in the prevalence of depressive symptoms ($\chi 2(5) = 22.24$, $p < .001$). As shown in table 5, participants with no history of family violence reported depressive symptoms significantly less often than those who had experienced family violence. Moreover, depressive symptoms were significantly more often reported by participants who had experienced either psychological violence alone, or psychological and physical violence, or psychological and sexual violence than the those in the other groups. The violence groups also displayed statistically significant differences in their MHC-SF mental health classifications ($\chi 2\ (10) = 23.73$, $p = .008$). As shown in **Study I**, table 5, participants with no history of family violence were classified more often as flourishing and less often as languishing than those in the other groups, whereas participants who had experienced psychological violence were classified significantly more often as languishing than those in the other groups.

One-way between-subjects ANOVAs indicated statistically significant differences between the violence groups in the MHC-SF clusters measuring emotional ($F(1928, 1933) = 5.09$, $p < .001$), social ($F(1928, 1933) = 5.77$, $p < .001$) and psychological well-being ($F(1928, 1933) = 3.15$, $p = .008$) as well as in sleep quality ($F(1936, 1941) = 4.44$, $p = .001$). The post-hoc analyses with Bonferroni correction indicated that compared to participants experiencing psychological abuse only, participants with no history of family violence scored higher on sleep quality ($p = .001$) and on emotional, ($p = .001$), social ($p < .001$) and psychological well-being ($p = .031$). Participants with no history of family violence also scored higher on emotional well-being than participants reporting combined psychological, physical, and sexual violence ($p = .041$). The means and standard deviations for these three violence groups are reported in table 3. No other significant differences were detected between the violence groups in MHC-SF cluster scores or sleep quality. The effect sizes for the ANOVA models were small ($\eta 2 = .008$-$.015$).

TABLE 3 Means (M) and standard deviations (SD) of continuous well-being variables in selected groups of family violence

		No family violence		Psychological violence		Psychological, physical & sexual violence	
	n	M	SD	M	SD	M	SD
Sleep quality	1 942	0.07	0.97	**-0.17**	**1.07**	-0.13	1.01
Emotional well-being	1 934	0.07	0.94	**-0.18**	**1.09**	**-0.29**	**1.16**
Social well-being	1 934	0.08	0.98	**-0.18**	**0.99**	-0.26	1.10
Psychological well-being	1 934	0.06	0.95	**-0.12**	**1.07**	-0.25	1.28

Note. Bolded values mark a statistically significant difference in comparison to the 'no violence' group

The analyzed direct and indirect mediation paths between family violence, sleep quality and mental health are outlined in **Study I**, figure 1. While sleep quality was found to be a significant mediator between family violence and all the dependent mental health variables, significant mediation effects were found only for the indirect paths (a*b) that included the "psychological violence only" and "psychological & physical violence" groups. The path coefficients and goodness-of-fit indices for the significant mediator models are presented in table 4. As can be seen from the indirect (a*b) and direct (c') path coefficients, sleep quality partially mediated the effect of psychological family violence on the depressive symptoms and MHC-SF cluster scores, and completely mediated the effect of psychological family violence on the MHC-SF classification. Sleep quality also partially mediated the effect of the combination of psychological and physical family violence on depressive symptoms and completely mediated the effect of the combination of psychological and physical family violence on the MHC-SF classification and cluster scores. The mediation models showed sufficient fit and accounted for 12-21% of the total variance in the dependent variables. In addition, the combination of psychological, physical and sexual family violence had a significant direct effect on the MHC-SF classification (Estimate = -0.07, 95% credibility interval (CR) [-0.12, -0.01]) and emotional well-being (Estimate = -0.06, 95% confidence interval (CI) [-0.11, -0.01]); however, the sleep-mediated indirect effects were not significant for these variables (Estimate = -0.08, CR [-0.16, 0.01] and Estimate = -0.01, CI [-0.03, 0.00], respectively).

TABLE 4 Standardized Bayesian estimates (SBE) and bias-corrected bootstrap estimates (BCBE) for the direct and indirect effects in the significant mediation models

	Depression		MHC-SF classification		Emotional well-being		Social well-being		Psychological well-being	
	SBE	[95% CR]	*SBE*	[95% CR]	*BCBE*	[95% CI]	*BCBE*	[95% CI]	*BCBE*	[95% CI]
Sleep quality										
Path b	-0.41	**[-0.10, -0.01]**	0.35	**[0.30, 0.39]**	0.38	**[0.33, 0.42]**	0.31	**[0.27, 0.35]**	0.34	**[0.29, 0.38]**
Psychological family violence										
Path a*b	0.11[a]	**[0.06, 0.17]**	-0.09[a]	**[-0.14, -0.05]**	-0.03	**[-0.05. -0.02]**	-0.03	**[-0.04, -0.01]**	-0.03	**[-0.05, -0.01]**
Path a	-0.10	**[-0.14, -0.05]**	-0.09	**[-0.14, -0.05]**	-0.09	**[-0.14, -0.04]**	-0.09	**[-0.14, -0.04]**	-0.09	**[-0.14, -0.04]**
Path c′	0.09	**[0.00, 0.16]**	-0.05	[-0.11, 0.00]	-0.06	**[-0.11, -0.02]**	-0.05	**[-0.09, -0.01]**	-0.05	**[-0.09, -0.00]**
Psychological & physical family violence										
Path a*b	0.07[a]	**[0.01, 0.13]**	-0.06[a]	**[-0.12, -0.01]**	-0.02	**[-0.04, -0.00]**	-0.02	**[-0.03, -0.00]**	-0.02	**[-0.03, -0.00]**
Path a	-0.05	**[-0.10, -0.01]**	-0.05	**[-0.10, -0.01]**	-0.05	**[-0.09, -0.01]**	-0.05	**[-0.09, -0.01]**	-0.05	**[-0.09, -0.01]**
Path c′	0.13	**[0.05, 0.19]**	-0.02	[-0.07, 0.04]	-0.02	[-0.06, 0.03]	-0.04	[-0.08, 0.00]	-0.03	[-0.08, 0.01]
	Goodness-of-fit indices									
Bayesian posterior predictive *p*	.565		.490		-		-		-	
RMSEA	-		-		.02		.00		.03	
CFI	-		-		.99		1.00		.98	
TLI	-		-		.93		1.01		.83	
SRMR	-		-		.01		.00		.01	
	Effect size									
R^2	.21[b]		.16[b]		.16		.12		.14	

Note. CR (credibility interval) and CI (confidence interval) ranges in bold are statistically significant. [a]Non-standardized values. [b]Calculated for the latent continuous dependent variable y*

5.2 Study II: Mental health and somatic diagnoses among victims of interpersonal violence identified in emergency care

The aim of **Study II** was to analyze the health symptoms of victims of interpersonal violence identified in emergency care. Comparisons were made between identified victims of family, sexual and other violence. The longitudinal data made it possible to analyze the mental and somatic health of the participants at different points in time. Respectively, the study addressed three research questions: 1) Did the victim groups differ in their diagnoses at their date of identification? 2) What effects of interpersonal violence on victims' health were found after identification? and 3) Can diagnostic predictors of family violence be detected before the identification of victims?

The results showed that most of the identified patients presented at emergency care with physical injuries, and that there were only a few differences between the diagnoses given to the victims of family, sexual, and other violence on their identification date. The victims of family violence presented with the most varied health symptoms both before and after identification, highlighting the diversity of family violence compared to other forms of interpersonal violence. However, no specific diagnostic risk markers were found that distinguished the victims of family violence from the victims of the other violence groups before identification. Overall, the victims of family and sexual violence showed more similarity in mental health problems and other symptoms than the victims of other violence.

Of the total of identified victims, 32.2% had experienced family violence, 9.3% sexual violence and 58.6% other violence. All the victims of sexual violence (AR ≥ 2.0) and 90.1% of victims of family violence (AR ≥ 2.0) were women, whereas 74.3% of the victims of other violence were men (AR ≥ 2.0). This gender difference was statistically significant ($\chi^2(2) = 150.04$, $p < .001$). The victims of sexual violence (mean rank (MR) = 95.16) were significantly younger than the victims of family violence (MR = 194.28; $p < .001$) or other violence (MR = 173.64; $p < .001$). Service use was common in the sample, with 83.5% of the participants having visited health care services during the two years before and 90.7% having done so during the first two years after identification.

Physical injury was the most common diagnosis recorded on the identification date, with as many as 79.1% of the victims having sustained physical injuries. However, only 4.6% were diagnosed with a more specific code indicating the external cause of the injury, such as family violence. The second most common diagnostic category was "other diagnoses", accounting for 20.0% of cases. Additional diagnoses assigned on the identification date included mental health disorders (5.2%) and unspecified symptoms (2.3%), as well as pregnancy complications, genitourinary problems, diseases of the musculoskeletal system and diseases of the circulatory system (< 1.0% each). Women experiencing family violence ($\chi^2(2) = 89.62$, $p < .001$; AR ≥ 2.0) and men experiencing other violence ($\chi^2(1) = 9.21$, $p = .002$; AR ≥ 2.0) were more likely to

be diagnosed with physical injuries than the victims in the other groups. On the other hand, the victims of sexual violence were diagnosed with physical injuries less often than the victims of family or other violence ($\chi^2(2) = 89.62$, $p < .001$; AR ≤ -2.0). Of the 32 identified victims of sexual violence, 29 received rape-related medical examinations only; these were recorded as other diagnoses. Thus, the victims of sexual violence were assigned this diagnostic code more often than the victims of the other types of violence ($\chi^2(2) = 146.50$, $p < .001$; AR ≥ 2.0). No other statistically significant differences existed between the victim groups on their identification date.

The victims of family violence significantly more often had at least one diagnosis recorded before their identification date than the victims in the two other violence groups ($\chi^2(2) = 8.34$, $p = .015$; AR ≥ 2.0). Compared to the other two groups, the victims of family violence were diagnosed significantly more often with genitourinary problems ($\chi^2(2) = 8.33$, $p = .016$; AR ≥ 2.0), pregnancy complications ($\chi^2(2) = 10.37$, $p = .006$; AR ≥ 2.0) and neurological problems ($\chi^2(2) = 6.07$, $p = .048$; AR ≥ 2.0). In addition, the victims of family violence were possibly more often diagnosed with mood disorders ($\chi^2(2) = 5.42$, $p = .067$; AR ≥ 2.0) and diseases of the nervous system ($\chi^2(2) = 5.50$, $p = .064$; AR ≥ 2.0).

After identification, the proportion of diagnosed participants increased in all the victim groups and the groups no longer differed significantly in the total prevalence of diagnoses ($\chi^2(2) = 4.52$, $p = .104$). However, the victims of family violence were diagnosed significantly more often with genitourinary problems than the victims of the other types of violence ($\chi^2(2) = 25.76$, $p < .001$; AR ≥ 2.0) and possibly more often with diseases of the nervous system ($\chi^2(2) = 4.28$, $p = .118$; AR ≥ 2.0). Compared to the victims of non-sexual violence by non-familial perpetrators, the victims of family violence also had significantly more diseases of the respiratory system ($\chi^2(2) = 17.53$, $p < .001$; AR ≥ 2.0), more genitourinary problems ($\chi^2(2) = 17.53$, $p < .001$; AR ≥ 2.0) and fewer substance-related disorders ($\chi^2(2) = 10.86$, $p = .004$; AR ≤ -2.0). No significant differences existed between the victims of family and sexual violence in these three variables. No significant differences were found between the violence groups in the overall prevalence of mental health disorders, although neurotic disorders were significantly more common after recognition among the victims of family and sexual violence (ARs ≥ 2.0) than victims of other violence (AR ≤ -2.0) ($\chi^2(2) = 7.41$, $p = .025$). In turn, the victims of other violence were diagnosed with substance-related disorders significantly more often ($\chi^2(2) = 10.86$, $p = .004$; AR ≥ 2.0) than victims in the other two groups (ARs ≤ -2.0).

A multinomial logistic regression model was conducted to identify possible predictors of family violence. The variables included in the model were mood disorders, neurotic disorders, diseases of the nervous system, genitourinary problems, pregnancy complications, unclassified symptoms, neurological symptoms, other diagnoses, age, and gender. While the final logistic regression model was statistically significant ($\chi^2(4) = 198.73$, $p < .001$), the only significant predictors of violence classification in the model were age and gender. According to the model, the victims of family violence were older than the victims of sexual

(B = 0.10, p < .001) or other violence (B = 0.03, p = .022) and more likely to be women than the victims of other violence (B = 3.35, p < .001). The regression model significantly classified 73.0% of all cases and 88.3% of the family violence victims. However, the ROC curves demonstrated that the model only had sufficient sensitivity and specificity to predict the classification of the victims of other violence (AUC = .844), but not that of the victims of family (AUC = .264) or sexual violence (AUC = .122).

5.3 Study III: Health care use and financial costs among victims of interpersonal violence identified in emergency care

The aim of **Study III** was to analyze the health care use of the identified victims of interpersonal violence in more detail. Comparisons were made between the health care use and costs of patients experiencing family, sexual, and other interpersonal violence both two years before and two years after identification in emergency care. The study addressed two research questions: 1) How often does each victim group use health care services and what are the associated financial costs? and 2) How do victims health care visits and costs develop over time before and after identification?

Patient records showed that the sample of identified victims made 19 290 health care visits and contacts, incurring the health care services total costs of 3.26 million euros, during the four-year study period. The health care costs in the sample were higher for all types of violence than estimates published in previous studies on the subject. Mean health care costs were highest in the family violence victim group, whose mean annual costs were 30% higher before identification and almost double after identification than those of the general population. This indicates the long-term nature of the negative effects on health resulting from violence both before and after identification. The victims of family violence demonstrated significantly higher health care use and costs in comparison to the victims of other interpersonal violence, but not in comparison to the victims of sexual violence. A significant increasing trend in the number of health care visits before identification was detected for all victim groups. After identification, the number of visits made by victims of family and sexual violence declined significantly.

The mean number of health care visits and contacts before identification was 22.49 (SD = 28.28, range 0-168) and after identification 34.07 (SD = 43.96, range 0-370). The ratio of participants with no recorded visits or contacts was 10.7% before identification and 3.7% afterwards. Health care use differed statistically significantly between the three victim groups both before ($\chi^2(2) = 8.91$, p = .012) and after ($\chi^2(2) = 11.26$, p = .004) identification. Before identification, the victims of family violence (MR = 194.66) used health care services significantly more often than the victims in the other violence group (MR = 159.92; p = .010). Similarly, the victims of family violence (MR = 193.61) used health care services

significantly more often than the victims of other violence also after recognition (MR = 157.87; p = .007). The health care use of all participants escalated during the period before identification. This linear correlation was strong for the victims in all three violence groups: family (r = .72, p < .001), sexual (r = .50, p < .001) and other (r = .74, p < .001). After identification, the health care use of the victims of the family violence (r = -.64, p < .001) and sexual violence (r = -.61, p < .001) decreased significantly, showing a strong linear correlation. In contrast, the health care use of the victims of other violence did not decrease significantly after identification (r = .01, p = .925).

Mean annual health care costs in the studied health care region throughout the study period were €1 650 per resident, whereas the corresponding costs of the victims of family violence were €2 180 before and €3 040 after their identification in emergency care. The corresponding means for the victims of sexual violence were €1 430 and €2 920 and for victims of other violence €1 770 and €2 750. A statistically significant difference was observed between the violence groups in mean health care costs both before ($\chi^2(2) = 6.98$, p = .031) and after recognition ($\chi^2(2) = 8.28$, p = .016). Before identification, the costs of the victims of family violence (MR = 193.36) were significantly higher than those of the victims in the other violence group (MR = 162.34, p = .025). As in the case of health care visits, health care costs also escalated towards the identification date among all participants. This linear correlation was strong for the victims in all three violence groups: family (r = .60, p < .001), sexual (r = .52, p < .001) and other (r = .57, p < .001). After identification, health care costs decreased significantly across all victims. This linear correlation was strong for the victims of family (r = -.56, p < .001) and sexual violence (r = -.52, p < .001) and low for the victims of other violence (r = -.23, p = .018). Weekly changes in health care costs are presented for each violence group in figures 1-3.

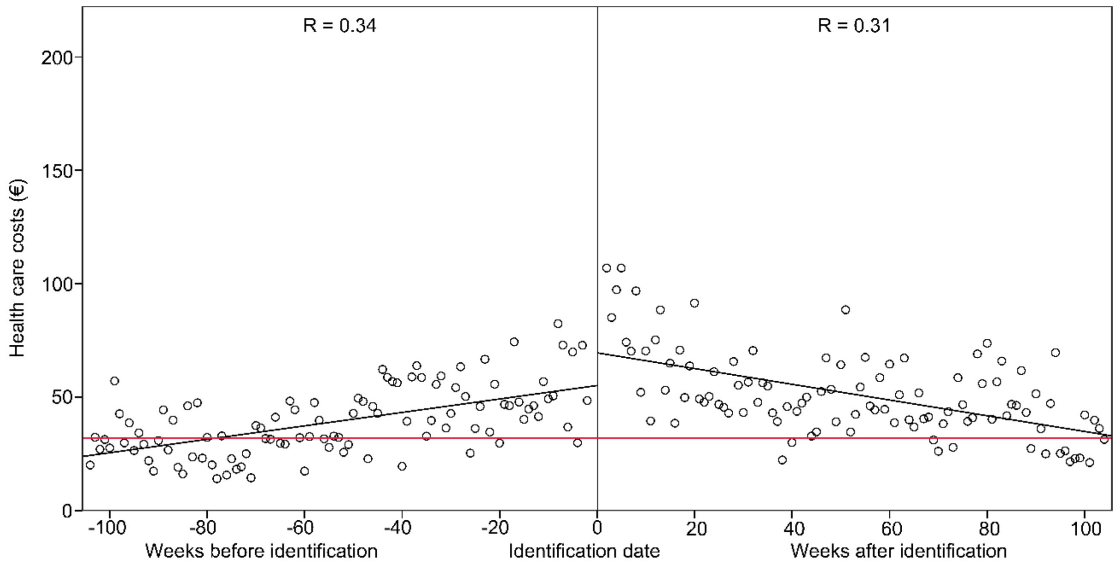

FIGURE 1 Correlation between standardized health care costs and time from date of identification for victims of family violence, compared to population mean.

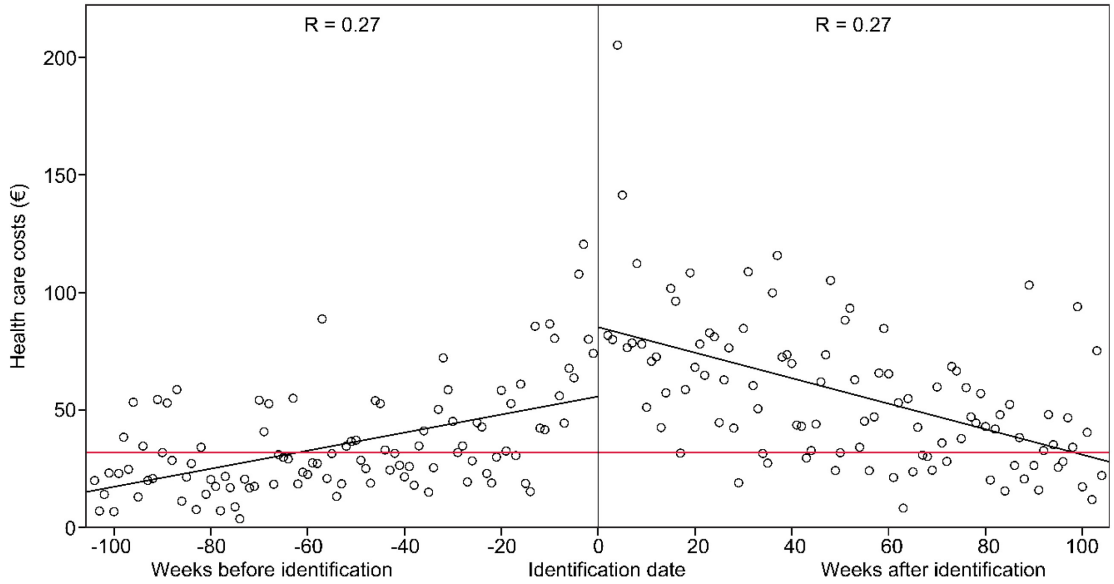

FIGURE 2 Correlation between standardized health care costs and time from date of identification for victims of sexual violence, compared to population mean.

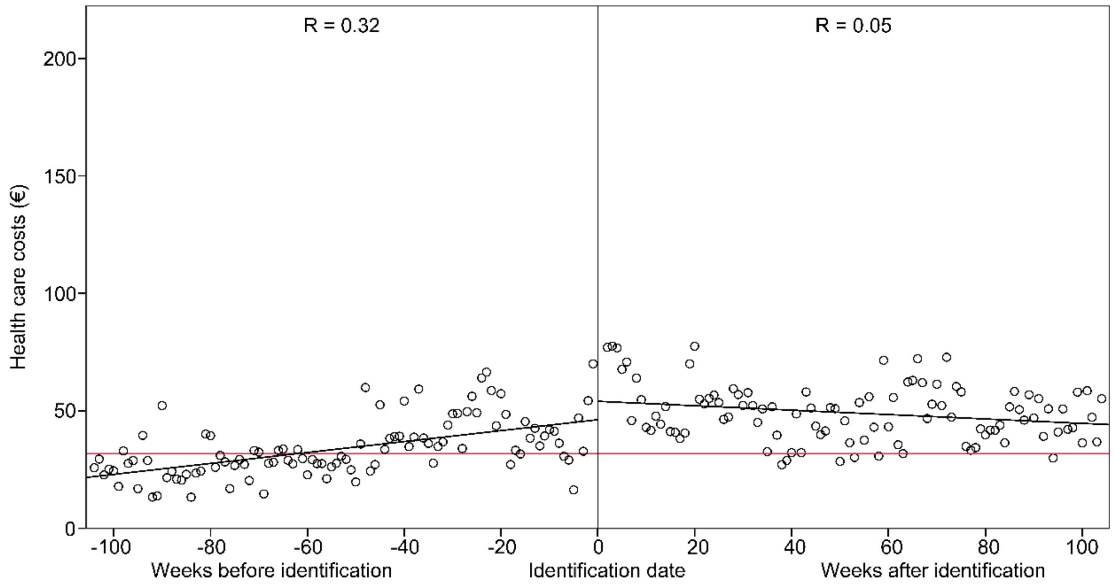

FIGURE 3 Correlation between standardized health care costs and time from date of identification date for victims of other violence, compared to population mean.

5.4 Summary of the studies

This dissertation examined family violence in Finland from the perspective of health care services. While the serious and long-term effects of various forms of family violence on both physical and mental health have long been established in comparison to non-victims, the present research contributed to the literature in several ways. First, the study demonstrated that the effects of family violence on health are at least as significant as those of other forms of interpersonal violence. The data also demonstrated that health care professionals are not immune to family violence but also share similar experiences. Furthermore, the present findings suggest that sleep quality mediates the mental health effects of psychological violence and could thus provide interesting possibilities for future research and interventions.

In addition to research on the individual effects on the victims of violence, there has also been a call for more research on the societal burden of family violence. The present data provided new empirical information on the health care costs of family violence. First, the victims of family violence generated 32% higher health care costs on average than general population before their identification and 84% higher costs afterwards. The victims of family violence also utilized health care services more often than the victims of other types of interpersonal violence. However, the health symptoms and health care use of the victims of sexual violence by unfamiliar perpetrators showed many similarities with that of the victims of family violence. These two victim groups, composed almost exclusively of women, thus significantly differed from the victims of other non-sexual and non-familial violence.

Second, this study also yielded empirical evidence on how the health care costs associated with family violence develop over time. The health care costs of the victims of family violence had already surpassed those of the general population 18 months before their identification in health care and continued to increase up to the date of identification, after which they began to decline. This is an important finding in light of the debate over whether allocating resources for the identification of family violence benefits either victims or the health care services. Taken together, the present findings clearly demonstrate that family violence is a serious public health problem in Finland due to its prevalence and its effects on and costs of treating victims' health.

6 DISCUSSION

6.1 Main findings

The aim of this dissertation was to provide more information on the burden on Finnish health care services of treating the victims of family violence. The first research question addressed the effects of family violence on victims' health, while the second research focused on the financial burden on public health services caused by family violence. The study utilized two separate data sets and participants identified as victims of family violence were compared with participants with no history of family violence and with participants experiencing other forms of interpersonal violence. This is the first longitudinal study on the wellbeing, health care use and financial costs of treating victims of family violence in Finland. To my knowledge, it is also the first study to directly compare the effects on victims and health care costs of different types of interpersonal violence. In accordance with the research questions, two research hypotheses were formulated: H1) Victims of family violence present with more mental and physical health problems than non-victims or victims of non-familial forms of interpersonal violence; and H2) Victims of family violence make higher use of health care services and generate higher costs than the general population or victims of non-familial forms of interpersonal violence.

The first research question was addressed in **Studies I and II**, and the findings indicate that family violence is a major problem in health care. Experiences of family violence were common among both patients and health care professionals and family violence was demonstrated to have multiple negative relationships with physical and mental health, in comparison to both non-victims and victims of non-familial interpersonal violence. These findings thus supported the first research hypothesis. **Study II** showed that victims of family violence used health care services with high frequency over the four-year study period. The most common diagnostic category among these patients was mental health problems, followed by physical injuries, unclassified symptoms, diseases of the respiratory system, genitourinary problems, diseases of the

nervous system, neurological problems and pregnancy-related complications. **Study I** further demonstrated the longevity of the mental health problems related to family violence suffered by its victims. Psychological abuse seemed to be especially harmful to mental health and well-being. Mediation analyses indicated that these effects could be explained by impaired sleep quality. However, the victims of physical family violence identified in **Study II** did not differ significantly from the victims of the other types of interpersonal violence with respect to sleep problems.

The second research question was addressed in **Study III**, and the results clearly show that family violence is a costly health care problem. The victims of family violence used health care services frequently during the four-year study period. As a result, their health care costs were 32% higher two years before their identification in emergency care and 84% higher two years after identification than those of the general population. Service use and associated costs were also significantly higher among the victims of family violence than in the other victim groups, especially before identification. These findings supported the second research hypothesis stating that victims of family violence have higher health care use and generate higher costs than the general population or victims of non-familiar forms of interpersonal violence. The health care costs of the victims of family violence already exceeded those of the general population 1.5 years before identification and further increased towards the date of identification. Victims' costs declined after identification, but continued to be higher than the general population means throughout the two-year post-identification follow-up. These trends in health care use and costs indicate that being identified in health care could be a turning point for the victims of family violence and help reduce the associated health care costs. In sum, **Studies II and III** indicated that in their health, service use and financial costs the victims of family violence can be clearly differentiated from the victims of interpersonal violence by non-familial perpetrators, while that the victims of sexual violence resemble the victims of family violence.

6.2 Relations to previous literature

The first research question addressed the health effects of family violence on its victims. Many of the findings support what is already known about the long-term health effects of family violence, including mental health problems and various somatic symptoms and diseases (Dillon et al., 2013; Ellsberg et al., 2008; Miller & McCaw, 2019; Riedl et al., 2019; Wright et al., 2019). The frequent health care use and various diagnoses of victims in the present sample demonstrate that although physical injuries are prevalent among victims of family violence, they represent only a minority of the health problems for which victims of family violence seek help from health care services (Farchi et al., 2013; Hoelle et al., 2015; Zachary et al., 2001). However, little research evidence is available on whether the health effects of family violence are more serious than those resulting from

other forms of interpersonal violence. The similarities between the victims of family and sexual violence found in the present study are in line with the links between these forms of violence and decreased mental health found in previous studies (Dillon et al., 2013; Dworkin, 2018) and with the higher psychological effects of family and sexual violence when compared to those of other interpersonal violence (Hisasue et al., 2020; Youstin & Siddique, 2019). The present findings also confirm that family and sexual violence are mostly experienced by women and other interpersonal violence by men (Heiskanen & Ruuskanen, 2010; Krug et al., 2002; Yau et al., 2013).

Generally speaking, the present findings demonstrated that differentiating victims of family violence from other victims of interpersonal violence based on their mental and somatic health is more difficult than differentiating them from non-victims. Whereas previous studies have identified several diagnostic predictors for family violence (Bhargava et al., 2011; Eaton et al., 2016; Reis et al., 2009), no significant predictors besides age and gender were detected in the present sample. Moreover, several health issues commonly associated with family violence, such as pain, neurological symptoms, sleep problems or the total prevalence of mental health problems, did not significantly differentiate victims of family violence from victims of other types of violence either before or after their identification. The reason for this might be that all forms of interpersonal violence are associated with negative health outcomes (Friborg et al., 2015; Krug et al., 2002; Tan & Haining, 2016). However, the present study demonstrated that compared to other victim groups, the victims of family violence suffered from a greater diversity of health symptoms, especially before their identification in emergency care. This is likely to reflect the repetitive nature of family violence in comparison to other forms of interpersonal violence (FRA, 2014; Heiskanen & Ruuskanen, 2010).

Although the identification of family violence victims in emergency care was based on physical injuries, in reality psychological abuse is the most common form of family violence in both the general population (FRA, 2014) and health care patients (Riedl et al., 2019). This fact was further demonstrated by the present data gathered from health care professionals. Moreover, in line with previous findings, the data also highlighted the harmfulness of psychological abuse in comparison to other forms of family violence (Friborg et al., 2015; Lagdon et al., 2014). However, the exact mechanisms explaining the harmfulness of psychological abuse remain unclear.

The present study suggests that the effects of psychological abuse might be due to the mediating effect of sleep quality, although the results must be evaluated with caution, since they were not derived from longitudinal data. Nonetheless, the negative effect of family violence on sleep quality has been well-established (Dillon et al., 2013) and sleep quality has, in turn, been associated with mental and physical health (Dolsen et al., 2014; Grandner et al., 2012). Some studies have found evidence for the mediating role of sleep quality between family violence and mental health (Lalley-Chareczko et al., 2015; Nowakowski et al., 2016; Pigeon et al., 2011), but these studies have not differentiated between

psychological and physical family violence. The present study suggests that the mediating effect of sleep quality between psychological family violence and victims' health might be unique. However, given the established associations between stress and sleep (Buysse et al., 2012; Ellis et al., 2012), it is possible that all forms of physical violence cause an impairment in sleep quality, which might explain why no significant differences in sleep quality were detected between the victims of different types of interpersonal violence.

The second research question addressed the use and costs of health services associated with family violence. The health care costs of treating the victims of family violence have not previously been estimated in detail in Finland, and little empirical data has been gathered on the subject internationally. Compared to previous estimates of the costs associated with different types of interpersonal violence (Dubourg et al., 2005; Heiskanen & Piispa, 2002), the present analysis found mean costs to be 37% higher for family violence, 38% higher for sexual violence, and 11-fold higher for other violence. Although the present and previous estimates cannot be directly compared owing to differences in research methodologies, they suggest that previous estimates on the mean costs per case of interpersonal violence underestimate the service use of the victims.

It is, of course, possible that the frequency of use of health care services by the present sample of victims of interpersonal violence was abnormally high. However, the present estimates are in line with previous reports on the service use of victims of family violence (Kruse et al., 2011; Rivara et al., 2007; Ulrich et al., 2003). Family violence is associated with various long-term health effects and the service use of the victims appears to change with time. For these reasons, cost estimates based on service use only after identification of the violent incident or for a short period, such as those reported by Dubourg et al. (2005) and by Heiskanen and Piispa (2002), are likely to be inaccurate. In addition to the general population, the identified victims of family violence also showed a higher frequency of health care service use than the other victim groups, despite the similarity between the victims of family and sexual violence in their health problems and service use patterns.

Most of the total health care costs of victims of family violence were generated after their identification. This indicates an unmet need for medical treatment for the various health problems associated with family violence. Previous studies have reported unmet health care needs among victims of family violence (Ferranti et al., 2018) and a high level of health care use even after the family violence has ended (Fishman et al., 2010). However, it is important to note that the victims of family violence also used health care services with high and increasing frequency before their identification in emergency care. This is in line with the findings by Hoelle et al. (2015) and indicate that the increasing frequency of health care use is likely to indicate cumulative exposure to violence, as has been detected in other studies (Farchi et al., 2013; Leppäkoski et al., 2011). As also found in other studies (Farchi et al., 2013; Hoelle et al., 2015), a majority of the family violence victims in the present sample were injured both before and after their identification date. The effectiveness of routine inquiry on reducing family

violence has thus been questioned (O'Doherty et al., 2015; Spangaro, 2017). In addition, victims of family violence have also reported negative experiences when disclosing abuse to health care professionals (Leppäkoski et al., 2011; Hinsliff-Smith & McGarry, 2017). However, the current data also supported the finding by Hoelle et al. (2015) that identification in health care was a turning point for victims that with time helped to reduce their subsequent use of health care services. This demonstrates that interactions with health care professionals can also promote significant change in the lives of family violence victims (Chang et al., 2010; Spangaro, 2017).

Based on the total prevalence rates of family violence reported by Notko et al. (2011) from the same hospital, it can be calculated that less than 1% of all emergency care patients with recent experiences of family violence were identified for the purpose of the present study. This is even lower than the 4.8% identification rate reported previously by Riedl et al. (2019). Identification of family violence in emergency care seems to be based almost exclusively on physical injuries (Davidov et al., 2015; Farchi et al., 2013), a notion supported by the present sample of identified victims. As a result, the majority of family violence victims who seek help for health problems other than physical injuries (Farchi et al., 2013; Hoelle et al., 2015) are likely to remain unidentified. This includes the many victims of psychological family violence (FRA, 2014; Riedl et al., 2019), who might not be able to associate their adverse health experiences with violence. Low identification rates thus constitute a major obstacle for family violence interventions. On the other hand, insufficient care and reporting of identified cases of family violence is also common (Dheensa, 2020; Donnelly & Holt, 2020; Kivelä, 2020), further increasing the risk for further abuse and health care visits.

Given the high prevalence of family violence both in Finland and elsewhere, it should not come as a surprise that experiences of family violence are also common among health care professionals. The prevalence of family violence in the present sample of health care professionals was found to be higher than previously reported among Scandinavian health care professionals (Stenson & Heimer, 2008; Janssen et al., 1998), but not as high as in the Finnish general population (FRA, 2014; Heiskanen & Ruuskanen, 2010; Sariola, 1990). The mental health symptoms associated with experiences of family violence among health care professionals are a cause for concern, as even mild psychological distress has been found to be a significant predictor of a future disability pension (Rai et al., 2012).

6.3 Implications

The results of this dissertation support what is already known about the detrimental health effects of family violence and highlight the need for more effective interventions targeted against violence. It is highly significant that the frequency of health care visits and costs of victims of family violence were found

to strongly increase before their identification in health care and to decline thereafter. This suggests that identification was a turning point for these victims and that earlier identification of family violence could ease individual suffering and reduce the financial burden on health care services.

Sexual violence was also found to have effects on health and health care use patterns very similar to those of family violence. The effects of these two forms of violence, which were almost exclusively experienced by women, thus differed from the effects of other interpersonal violence. This indicates that violence has a significant impact on the health of women in Finland. At the same time, interventions targeted against violence experienced by women have the greatest potential for reducing the costs of health care services. However, the current results also indicated that interventions against family violence are likely to remain inadequate if they are unable to factor in psychological as well as physical abuse.

The low number of identified victims combined with fact that the health care costs of the victims of family violence had already exceeded those of the general population 1.5 years before their identification indicate that there is room for significant improvement in the identification of these patients. However, the victims of family violence presented to health care services with a wide range of problems and no significant diagnostic predictors differentiating the victims of family violence from the victims of the other types of interpersonal violence were detected. This finding supports the implementation of routine inquiry about family violence in all health care services or at least for several patient groups, such as women seeking help for physical injuries and mental health problems or presenting to prenatal care. The findings that the identified victims used a wide variety of health care services and that experiences of family violence were also common in the non-clinical sample of health care professionals indicate that identification of family violence should not be restricted to specific services such as emergency care but instead be introduced across the health care sector.

Although the frequency of health care visits by victims of family violence was found to decline after their identification, half of them were re-injured after identification, as reported in **Study III**. Thus, simply being identified in health care does not automatically mean that the violence has ended. Furthermore, most of the health care visits by the victims of family violence took place after identification, which likely reflects the intensity of the care needed for treat the various adverse health effects of violence. These findings indicate that patients experiencing family violence should be provided with long-term support and that appropriate treatment models should be available for all victims of violence identified in health care. The results of this study indicate that supporting the sleep quality of victims via medically or psychosocially based sleeping interventions could an effective way of addressing the mental health outcomes of family violence.

On the other hand, as discussed in **Study III**, there is no indication that the identified victims of family violence in the present study had received any special intervention or care. This implies that 'treatment as usual' can significantly

reduce the adverse effects of family violence on victims' health. This should be encouraging news for health care services and professionals struggling with limited resources and supports the implementation of more comprehensive identification practices. Although all health care patients, and especially victims of family violence, support being asked about violence by health care professionals, the identification rates of family violence remain systematically low across health care services (Hinsliff-Smith & McGarry, 2017; Riedl et al., 2019). It seems that victims seeking help for problems other than physical injuries, including those resulting from psychological abuse, are more likely to remain unidentified. As a result, health services are likely to treat the symptoms of violence alone, allowing the underlying health problems to accumulate over time.

Health care professionals have listed many reasons for their reluctance to ask patients about family violence, such as lack of training, time pressure, insufficient facilities and lack of organizational support (Alvarez et al., 2017; Donnelly & Holt, 2020; Hinsliff-Smith & McGarry, 2017; Husso et al., 2012). These are, of course, valid concerns that need to be considered in health care organizations. Husso et al. (2020) have also reported on the difficulty of implementing development projects in health care services, meaning that training, organizational support and general acceptance of the importance of identifying family violence are not necessarily enough to change existing practices in health care. Furthermore, experiences of family violence by health care professionals themselves have mostly been overlooked.

It is known that workplace violence is a significant issue among health care professionals that has several negative consequences, such as impaired mental and physical health and a higher rate of burnout (Mento et al., 2020). Thus, it should not be surprising that family violence also significantly affects the health and well-being of health care professionals. If not adequately addressed, the associated psychological distress poses a serious risk to the working ability of health care professionals with a history of family violence (Rai et al., 2010; Rai et al., 2012). Personal experiences of family violence may also affect the quality of the care received by patients experiencing abuse (Alvarez et al., 2017; Hinsliff-Smith & McGarry, 2017; Leppäkoski et al., 2010). For these reasons, family violence and its effects on employee health should be better acknowledged in occupational health care, and health care professionals should be actively offered support on these issues.

More effective family violence interventions also entail changes on many other levels. In health care services, more resources should be allocated to staff training and the implementation of routine inquiry about family violence. The responsibility for asking about family violence should not left to individual professionals; instead, the identification practices developed require institutional support and supervision. Without effective administration, identification and intervention practices risk becoming a short-term bandage for a problem that requires constant attention (Husso et al., 2020). On the other hand, health care services do not exist in a vacuum but instead reflect the societal practices and attitudes in general. Interpersonal violence is a socio-political problem that

requires more decisive interventions and preventive actions throughout the society (Heise, 1998; Krug et al., 2002). Thus, general awareness of family violence and its consequences is needed on all levels of society, including both the general population and policy makers.

Accepting that family violence as a serious public health problem and a human rights issue instead of a private (and rare) relationship problem is crucial if we wish to eradicate or at least significantly reduce violence and its adverse consequences. The recent recommendations on family violence prevention and intervention made by the Finnish government (Ruuskanen, 2020) appear promising, but recommendations are not enough unless they are implemented in practice by both the state, municipalities and individual organizations. The change in violence against children offers an encouraging example: since the corporal punishment of children was outlawed in Finland in 1984, the amount of family violence experienced by children has fallen significantly and attitudes towards corporal punishment have become less accepting (Fagerlund et al., 2014). There is also growing evidence on the effectiveness of various responses utilized in health care services to reduce the adverse outcomes of family violence (Spangaro, 2017). These findings demonstrates that family violence can and should be reduced by public policies and by legislation.

6.4 Limitations

This study has its limitations that should be considered when evaluating the results. First, the fact that the two data sets used in this study were gathered in just one health care district, and hence not population-based, significantly restricts the generalizability of the results. The study would clearly have benefitted from larger and more comprehensive samples that would, for example, have enabled more detailed gender-based comparisons and provided information on the experiences of family violence among different occupational groups. The limited database also means that the results of this research might not be directly replicable in cultural contexts outside Finland. The problem of generalizability also affects family violence research more generally, since most of the existing studies have been conducted in western industrialized countries, and a large proportion of these in the USA. Comparisons on the effects and costs of family violence between the present and previous studies are difficult to make owing to the considerable diversity in the research terms and methodologies used. The terminological problems also make literature searches more difficult, and hence it is possible that some key studies on the subject were not included in the present literature review. In addition to these general limitations, both data sets included specific limitations that need to be discussed.

The first main limitation of the first data set is that the survey used in the study did not define family violence in detail. Examples of different violent acts might have helped participants to identify, in particular, experiences of psychological and sexual abuse. In addition, measures of family violence based

on self-reports alone are prone to recall bias. Thus, the validity of the family violence measure is somewhat compromised. Moreover, the survey did not ask about when precisely the reported violence had taken place or who perpetrated it. As a result, the experiences of participants reporting family violence might have been very different and not directly comparable. Although the sample constituting the first data set was rather large, the number of persons reporting some forms violence, especially sexual violence, was small. This affects the comparisons made between the different violence groups and might have caused overestimation of the effects of psychological abuse. Second, the cross-sectional nature of the data set means that the mediation analyses conducted in **Study I** are not reliable and must therefore be interpreted with caution.

In the second data set, the most significant limitation is the lack of a comparison group of non-victims. The three victim groups of family, sexual and other violence identified in the sample were heterogeneous in size and gender, and thus a matched comparison group or groups would have significantly increased the validity of the results. Moreover, gender and age were the only sociodemographic factors available for analysis. This makes it difficult to evaluate the generalizability of the results. The same applies to the low number of victims of family violence identified in the emergency department. In addition, no information on possible poly-victimization was available in the sample. It is likely that some overlap exists between the identified victim groups, e.g., some participants might have experienced more than one type of interpersonal violence, thereby possibly masking some of the differences between the identified groups. Likewise, no information was available on possible repeated victimization within the sample. This information would have helped to evaluate in more detail the possible accumulation of health effects caused by violence.

6.5 Future research

The preliminary nature of the present study calls for more research. To validate the present results, the findings on health care use and costs, differences between the violence types and the mediating effect of sleep quality should all be replicated in other samples with appropriate longitudinal designs. The patterns in mental and physical health associated with family violence found in this study are interesting and highlight the need for more longitudinal research on how help seeking or disclosure of violence affects the long-term health and well-being of victims. To more accurately evaluate the personal and societal costs of family violence, future research should also estimate the other costs generated outside health care services, such as those resulting from divorce, legal services and social services.

Much is already known about the prevalence and adverse effects of family violence and this research adds further to this knowledge. It should by now be clear *why* health care services need to address family violence more effectively. The logical next step would be to gather research evidence on *how* this could best

be done. Possible research topics in health care settings include the development and long-term implementation of identification practices (encompassing different forms of family violence) and developing family violence interventions and service models that are accessible, practical and scalable to various settings. The findings of the present study demonstrate that to fully understand the causal relationships between family violence, health and health care procedures calls for longitudinal research on new interventions and service models. Given the complex nature of family violence, it is likely that both bottom-up procedures (such as increasing the motivation and skills of individual professionals) and top-to-bottom policies (such as providing new guidelines and resources) are needed to implement sustainable family violence-related service models within health care. This presents a challenge for development and research, as limited short-term projects are at serious risk of wasting both time and money.

In addition to statistical measures of effectiveness, qualitative research during the implementation of new practices could provide valuable information on possible risks and obstacles in specific contexts and thus help to reduce or eliminate them. Given the high prevalence and low identification rates of family violence in health care, the effectiveness of measures intended to increase identification rates could also be preliminary evaluated already during the modification process. Additionally, the findings of both new and existing studies should be communicated more effectively to the general population in order to change violence-related attitudes and to ensure that family violence is universally seen as an important public health issue. General awareness of the issue would likely help to formulate effective public policies and legislation against family violence.

6.6 Conclusion

This study highlights the prevalence of family violence as a major problem that affects both individuals and society. The present findings are in line with what is already known about the harm caused by family violence and further demonstrate that the mental and physical health effects of family violence are significant in comparison to those of non-victims as well as the victims of other types of interpersonal violence. Family violence incurs significant costs to public health care services. However, most of the victims of family violence remain unidentified at first entry to health services, allowing for the health problems and costs to accumulate over time. Family violence affects both individuals, institutions and society and thus more resources should be dedicated to the prevention of family violence. Health care services are a natural point of contact for family violence victims, but if violence is not identified and interventions are lacking, the associated health care effects and costs are likely to increase over time. For more effective identification practices to be implemented in health care, family violence must be acknowledged as a major public health problem at all levels of society.

YHTEENVETO (SUMMARY IN FINNISH)

Lähisuhdeväkivalta kansanterveydellisenä ongelmana: Vaikutukset ja kustannukset suomalaisessa terveydenhuollossa

Lähisuhdeväkivalta on nimensä mukaisesti väkivaltaa, jota tekijä kohdistaa puolisoonsa, lapsiinsa, vanhempiinsa, sisaruksiinsa tai muihin erityisen läheisiin henkilöihin (Krug ym., 2002). Väkivallaksi lasketaan kaikki fyysiset, henkiset ja seksuaaliset teot, jotka aiheuttavat fyysistä tai psyykkistä haittaa niiden kohteelle (Krug ym., 2002; Miller & McCaw, 2019). Väkivaltaa ovat siis myös uhkaukset ja kontrolloiva käytös, jotka aiheuttavat uhrille pelkoa tai rajoittavat tämän itsemääräämisoikeutta. Vaikka lähisuhdeväkivaltaa voivatkin kokea kaikki ihmiset sukupuoleen, ikään, etniseen taustaan, maantieteellisen sijaintiin, sosioekonomiseen asemaan, seksuaaliseen suuntautumiseen tai toimintakykyyn katsomatta (Krug et al., 2002; Riedl et al., 2019), on valtaosa lähisuhdeväkivallan uhreista naisia ja lapsia ja tekijöistä puolestaan miehiä (Krug ym., Heiskanen & Ruuskanen, 2010; Yau et al., 2013). Kysesessä on siis myös sukupuolittunut ongelma. Tuoreimman EU:n tasolla toteutetun tutkimuksen perusteella Suomi kuuluu Euroopan väkivaltaisimpien maiden joukkoon: suomalaisista naisista 5% raportoi kohdanneensa fyysistä tai seksuaalista parisuhdeväkivaltaa kuluneen vuoden ja 30% elämänsä aikana, kun vastaavat EU:n keskiarvot olivat 4% ja 22% Naisten kokeman henkisen parisuhdeväkivallan yleisyys oli puolestaan 52% Suomessa ja 43% koko EU:ssa.

Lähisuhdeväkivalta on yhteydessä lukuisiin terveyshaittoihin, joihin kuuluvat muun muassa vammat, krooninen kipu, psykosomaattiset oireet, gynekologiset ongelmat, nukkumisvaikeudet, astma sekä sydän- ja verenkiertoelimistön häiriöt (Dillon ym., 2013; Ellsberg ym., 2008; FRA, 2014; García-Moreno ym., 2013; Heiskanen & Ruuskanen, 2010; Miller & McCaw, 2019; Riedl ym., 2019; Wright ym., 2019). Myös vakavat mielenterveysongelmat, kuten masennus, itsetuhoisuus ja post-traumaattinen stressihäiriö, ovat yleisiä lähisuhdeväkivallan uhreilla (Dillon et al., 2013; Riedl et al., 2019). Lähisuhdeväkivallan kokemiseen liittyy usein voimakasta häpeää ja pelkoa (Catallo ym., 2012; Krug ym., 2002). Nämä negatiiviset kokemukset voivat vahvistaa väkivallan haittavaikutuksia (Karakurt ym., 2014) sekä myös selittää, miksi vain vähemmistö väkivallan uhreista hakee apua terveydenhuollosta, poliisista tai muista palveluista (FRA, 2014). Lähisuhdeväkivallan lukuisten terveyshaittojen vuoksi uhrien on kuitenkin arvioitu käyttävän terveyspalveluja 25-100% enemmän kuin muun väestön (Kruse ym., 2011; Rivara ym., 2007; Ulrich ym., 2003). Suomessa lähisuhdeväkivallasta aiheutuvia terveyskustannuksia on arvioitu viimeksi vuonna 2001 ja tuolloin lähisuhdeväkivallan arvioitiin aiheuttavan vuoden 2019 rahaksi muutettuna 23 miljoonan euron vuosittaiset terveyskustannukset koko maan tasolla (Heiskanen & Piispa, 2002).

Lähisuhdeväkivallan yleisyydestä ja haitallisuudesta huolimatta suurin osa terveyspalveluita käyttävistä uhreista jää tunnistamatta (Hinsliff-Smith & McGarry, 2017; Riedl ym., 2019). Maailman terveysjärjestö WHO (2016) onkin

suosittanut, että terveydenhuollon toimijoiden tulisi puuttua lähisuhdeväkivaltaan nykyistä aktiivisemmin. Suositusta tukee myös se, että monien terveydenhuollon asiakkaiden, kuten raskaana olevien naisten ja mielenterveyspotilaiden, on havaittu kuuluvan lähisuhdeväkivallan riskiryhmiin (Alhabib et al., 2010; Notko et al., 2011). Myös EU on suosittanut jäsenmailleen naisiin kohdistuvan väkivallan vaikutusten ja kustannusten tarkempaa selvittämistä (EIGE, 2014). Näiden suositusten toteuttaminen olisi olennaista, sillä vaikka lähisuhdeväkivallan yleisyys ja ongelmallisuus tiedostetaan aiempaa paremmin, on väkivallan ehkäisyssä ja puuttumisessa edelleen merkittäviä puutteita myös Suomessa (YK:n yleiskokouksen lausuma, 2017). Ongelma on nyt entistäkin ajankohtaisempi, sillä vuonna 2020 alkaneen koronaviruspandemian on havaittu lisänneen entisestään lähisuhdeväkivaltaa sekä Suomessa että muualla maailmassa (Moreira et al., 2020; THL, 2020). Lähisuhdeväkivaltaan tulisikin puuttua nykyistä tehokkaammin sekä yksilöllisten haittojen että yhteiskunnallisten kustannusten vähentämiseksi.

Tämän tutkimuksen tavoitteena oli kartoittaa tarkemmin lähisuhdeväkivallan vaikutuksia Suomen terveydenhuoltojärjestelmälle ottaen huomioon sekä yksilöille että yhteiskunnalle aiheutuvat haitat. Täten ensimmäinen tutkimuskysymys käsitteli lähisuhdeväkivallan uhreille aiheutuvia terveysvaikutuksia ja toinen tutkimuskysymys käsitteli lähisuhdeväkivallasta terveydenhuoltojärjestelmälle aiheutuvia kustannuksia. Tutkimuksessa hyödynnettiin kahta aineistoa, jotka molemmat kerättiin yhteistyössä Keski-Suomen sairaanhoitopiirin kanssa. Tutkimuksessa lähisuhdeväkivaltaa kokeneita henkilöitä verrattiin sekä ei-väkivaltaa kokeneisiin että muun tyyppistä väkivaltaa kokeneisiin henkilöihin. Kyseessä on ensimmäinen suomalainen pitkittäistutkimus lähisuhdeväkivallan vaikutuksista uhrien hyvinvointiin, terveyspalveluiden käyttöön ja -kustannuksiin. Tietääkseni tämä on myös kansainvälisesti ensimmäinen tutkimus, joka vertailee suoraan lähisuhde- ja muun väkivallan terveysvaikutuksia sekä -kustannuksia.

Osatutkimus I tarkasteli lähisuhdeväkivallan yleisyyttä ja vaikutuksia 1 952 Keski-Suomen sairaanhoitopiirin työntekijän keskuudessa. Tutkimuksen tulokset osoittivat, että lähisuhdeväkivaltakokemukset ovat yleisiä suomalaisten terveydenhuollon työntekijöiden parissa, sillä 38% vastaajista raportoi kohdanneensa fyysistä, henkistä tai seksuaalista lähisuhdeväkivaltaa ainakin kerran elämässään. Lähisuhdeväkivaltakokemukset olivat merkitsevästi yleisimpiä naisten kuin miesten keskuudessa. Verrattuna ei-väkivaltaa kokeneisiin, oli lähisuhdeväkivaltaa kokeneiden vastaajien hyvinvointi merkitsevästi huonompi kaikilla tutkimuksissa käytetyillä mittareilla mitattuna, eli masennusoireiden, MHC-SF-mielenterveyskyselyn sekä unen laadun osalta. Lisäksi tutkimuksessa havaittiin, että henkisen lähisuhdeväkivallan kokemukset olivat toistuvimmin yhteydessä heikentyneeseen hyvinvointiin. Tutkimuksen perusteella tämä yhteys henkisen lähisuhdeväkivallan ja mielenterveyden välillä voidaan ainakin osittain selittää unen laadun välittävällä vaikutuksella.

Osatutkimus II vertaili puolestaan eri väkivaltatyyppien terveysvaikutuksia. Tutkimusaineisto kerättiin 345:ltä Keski-Suomen keskussairaalan päivystys-

polin potilaalta, joiden oli tunnistettu kokeneen joko lähisuhdeväkivaltaa, ei-läheisen henkilön tekemää seksuaalista väkivaltaa tai ei-läheisen henkilön tekemää muuta väkivaltaa. Tutkittavien terveydentilaa tarkasteltiin heidän potilastietojensa avulla kaksi vuotta ennen päivystyspolilla tunnistamista sekä kaksi vuotta sen jälkeen. Lähes kaikki tunnistetut lähisuhde- ja seksuaalisen väkivallan uhrit olivat naisia, kun taas muun väkivallan uhreista suurin osa oli miehiä. Tutkimus osoitti, että vain prosentti kaikista lähisuhdeväkivaltaa kohdanneista potilaista tulee tunnistetuksi päivystyspolilla. Kaikista tunnistetuista väkivallan uhreista valtaosa oli hakeutunut hoitoon fyysisten vammojen vuoksi eikä tunnistamispäivänä kirjattujen diagnoosien suhteen havaittu merkitseviä eroja eri väkivaltaryhmien välillä. Lähisuhdeväkivallan uhreille oli kuitenkin kirjattu moninaisempia diagnooseja kaksi vuotta ennen ja jälkeen tunnistamisen, mikä viittaisi siihen, että lähisuhdeväkivallan terveysvaikutukset ovat laaja-alaisemmat kuin muiden väkivaltatyyppien. Tutkimuksessa ei kuitenkaan löydetty tiettyjä ennakoivia diagnooseja, jotka olisivat luotettavasti erotelleet lähisuhdeväkivaltaa kokeneet henkilöt muista väkivallan uhreista jo ennen tunnistuspäivää. Kaiken kaikkiaan tutkimuksessa havaittiin, että lähisuhde- ja seksuaalisen väkivallan uhrien mielenterveys- ja muut oireet muistuttivat toisiaan ja erosivat kolmannesta tutkitusta ryhmästä eli henkilöistä, jotka olivat kokeneet ei-läheisen tekemää ei-seksuaalista väkivaltaa.

Osatutkimus III kartoitti tarkemmin näiden päivystyspolilla tunnistettujen uhriryhmien terveyspalveluiden käyttöä. Vuosittaiset terveydenhuollon kustannukset olivat tutkimusajankohtana Jyväskylän kaupungissa keskimäärin 1 650 euroa asukasta kohden, kun taas lähisuhdeväkivallan uhreilla vuosikustannukset olivat aineiston perusteella keskimäärin 2 180 euroa ennen ja 3 040 euroa jälkeen tunnistamisen. Lähisuhdeväkivaltaa kokeneiden potilaiden terveyskustannukset olivat merkitsevästi korkeammat kuin ei-läheisen, ei- seksuaalisen väkivallan uhreilla. Korkeammat kustannukset sekä väestön keskiarvoon että muuhun väkivaltaan nähden korostavat lähisuhdeväkivallan terveysvaikutusten vakavuutta ja pitkäaikaisuutta. Tutkimuksessa myös havaittiin, että kaikkien väkivallan uhrien terveyspalveluiden käyttö lisääntyi lineaarisesti tunnistuspäivämäärää lähestyttäessä. Tunnistamisen jälkeen terveyspalveluiden käyttö puolestaan laski lähisuhdeväkivallan ja seksuaalisen väkivallan uhreilla, mutta ei muun väkivallan uhreilla. Lähisuhdeväkivallan uhrien terveyskustannukset ylittivät väestön keskiarvon jo 1.5 vuotta ennen heidän tunnistamistaan ja nämä tulokset viittaavatkin siihen, että lähisuhdeväkivallan aikaisemmalla tunnistamisella terveydenhuollossa voitaisiin merkittävästi vähentää potilaiden hoidosta aiheutuvia kustannuksia.

Tutkimuksen tulokset koskien lähisuhdeväkivallan yleisyyttä ja haitallisuutta osoittavat, että lähisuhdeväkivalta on vakava kansanterveydellinen ongelma Suomessa. Toisaalta tutkimuksessa havaitut samankaltaisuudet lähisuhde- ja seksuaalisen väkivallan uhrien terveyspalveluiden käytössä viittaavat siihen, että näiden pääosin naisiin kohdistuvien väkivallan muotojen vähentämisellä voitaisiin saavuttaa merkittäviä kustannussäästöjä julkiselle sektorille. Ter-

veydenhuollossa tulisikin ottaa käyttöön nykyistä kattavampia seulontamenetelmiä ja lähisuhdeväkivallasta tulisi kysyä rutiininomaisesti ainakin tietyiltä korkean riskin potilasryhmiltä, kuten fyysisten vammojen tai mielenterveysongelmien takia hoitoon hakeutuvilta naisilta sekä raskaana olevilta henkilöiltä. Pelkkä fyysisestä väkivallasta kysyminen ei todennäköisesti kuitenkaan riitä, vaan lähisuhdeväkivallasta aiheutuvien haittojen vähentäminen vaatii myös henkisen väkivallan tehokkaampaa tunnistamista sekä pitkäaikaisen tuen tarjoamista väkivaltaa kokeneille potilaille. Lähisuhdeväkivallan asianmukainen kohtaaminen vaatiikin terveydenhuollon työntekijöiltä riittävää koulutusta, resursseja sekä työnantajan tukea (Alvarez ym., 2017; Donnelly & Holt, 2020; Hinsliff-Smith & McGarry, 2017; Husso ym., 2012). Lisäksi tämä tutkimus viittaa vahvasti siihen, että myös terveydenhuollon työntekijöiden omat väkivaltakokemukset tulisi huomioida nykyistä paremmin ja niihin tulisi olla tarjolla matalan kynnyksen tukea esimerkiksi työterveyshuollon kautta.

Koska lähisuhdeväkivallan terveyshaitat ovat olleet tiedossa jo pitkään, tulisi aihetta käsittelevän tutkimuksen keskittyä jatkossa kartoittamaan keinoja, joilla väkivaltaan voitaisiin kaikkein tehokkaimmin puuttua. Terveydenhuollon piirissä tutkimusta tulisi kohdentaa esimerkiksi lähisuhdeväkivallan tunnistamismenetelmien kehittämiseen ja käyttöönottoon. Lisäksi terveydenhuoltoon tulisi kehittää tehokkaita ja kattavia lähisuhdeväkivallan hoitopolkuja ja työntekijöitä tulisi kouluttaa järjestelmällisesti näiden puuttumismallien käyttöönottoon. Näillä keinoilla terveydenhuoltojärjestelmä voisi onnistua merkittävästi vähentämään lähisuhdeväkivallasta aiheutuvia pitkäaikaisia kustannuksia. On kuitenkin tärkeää tiedostaa, että lähisuhdeväkivalta on monimutkainen sosio-poliittinen ongelma, johon vaikuttavat monet niin yksilölliset, sosiaaliset kuin yhteiskunnallisetkin tekijät (Heise, 1998; Krug ym., 2002). Siksi lähisuhdeväkivaltaan puuttumista ei voida ulkoistaa vain yhdelle yhteiskunnan osa-alueelle, vaan väkivallan vähentäminen vaatii muutoksia niin yksilöiden asenteissa kuin politiikassa, kulttuurissa ja yhteiskunnan rakenteissakin.

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ORIGINAL PAPERS

I

FAMILY VIOLENCE AND MENTAL HEALTH IN A SAMPLE OF FINNISH HEALTH CARE PROFESSIONALS: THE MEDIATING ROLE OF PERCEIVED SLEEP QUALITY

by

Heli Siltala, Juha Holma & Maria Hallman, March 2019

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Family Violence and Mental Health among Finnish Health Care Professionals:

The Mediating Role of Perceived Sleep Quality

Abstract

Objective

The aim of the study was to investigate the prevalence and effects of family violence (FV) among Finnish health care professionals. In addition to analyzing direct connections between different types of FV and mental health, the mediating effect of sleep quality was also taken into account.

Methods

The study followed a cross-sectional design. The sample comprised 1 952 health care professionals from Central Finland, who participated in a survey measuring their health and well-being. The dependent variables were perceived sleep quality and mental health as measured by depressive symptoms and the MHC-SF questionnaire. Data were analyzed using cross-tabulations, ANOVA and structural equation modelling.

Results

41% of the participants reported experiencing FV. The most common forms of abuse were "psychological FV only" and "psychological & physical abuse". Participants with FV experiences scored significantly worse on depressive symptoms ($p < 0.001$), MHC-SF classification ($p = 0.008$), sleep quality ($p = 0.001$) and emotional ($p < 0.001$), social ($p < 0.001$), and psychological ($p = 0.008$) well-being. The mediation analyses indicated that the harmfulness of FV was at least partially explained by impaired sleep quality.

Conclusions

The results demonstrate that FV experiences are common among Finnish health care professionals and that they significantly affect their mental health. FV should thus be taken to account in seeking to promote the occupational well-being of health care professionals. The results also suggest that the harmfulness of FV might be mediated by sleep quality. This finding prompts the need for further investigation and FV-related interventions.

Keywords: family violence, mental health, sleep, health care professionals, care givers

Family Violence and Mental Health in a Sample of Finnish Health Care Professionals:

The Mediating Role of Perceived Sleep Quality

Introduction

In this paper, family violence (FV) is defined as close-relationship violence. FV includes intimate partner violence but can also refer to abuse between parents and children, between siblings and between former partners. Although there is much variation in the terms and definitions used in the scientific literature, FV is clearly a major public health issue that affects the well-being of numerous people around the world. According to the World Health Organization, FV can be physical, sexual or psychological (1). The prevalence of adulthood FV seems to be somewhat higher in Finland than elsewhere in Europe (2, 3) with as many as 17% of Finnish women and 16 % of men reporting physical or sexual abuse in their current relationship and 42% of women and 22% of men reporting abuse in a previous relationship (4). Additionally, 53% of Finnish women have reported experiencing psychological FV during their lives (3). No corresponding data currently exist on men. Recent years have witnessed a significant decrease in FV experienced by Finnish children (5) whereas in earlier decades the prevalence of childhood psychological or physical FV was as high as 70% (6). Thus, experiences of childhood FV are common among Finnish adults.

The effects of life-time exposure to family violence include injuries and various physical symptoms, depression, posttraumatic stress disorder (PTSD), anxiety, suicidal tendencies, impaired sleep quality, substance abuse and social dysfunction (7, 8, 9, 10, 11). It is also noteworthy that mental health symptoms resulting from FV can be harmful even at the sub-diagnostic level (12). All these related physical and psychological health issues mean that people with FV experiences are more likely than non-victims to use health care services (1). It should also be noted that many patient groups, such as pregnant women and psychiatric patients, are especially vulnerable to FV victimization (2). Health care

professionals could thus potentially play a major role in both recognizing and treating the consequences of FV.

However, studies have also indicated that health care professionals' personal FV experiences may affect their recognition of FV and level of care in FV cases, as well as their general work performance and well-being (13, 14, 15). Despite these connections, only a few studies have investigated FV experiences among health care professionals themselves. In these studies, the overall life-time prevalence of FV has been found to be over 20% in Finland and Sweden (15, 16) and 38-39% in other countries (17, 18). Studies distinguishing between different forms of FV among health care professionals have reported prevalence rates of 13-25% for physical or sexual abuse, 7% for specific sexual abuse and 14-42% for emotional abuse (16, 19, 20). To our knowledge, no studies have reported on the prevalence of different types of FV among Finnish health care professionals.

The health effects of FV are long-term and may persist for years or even decades after the abuse has ended (7, 9). This seems to be especially true in the case of mental health symptoms (7), although the reason for this remains unclear. A growing body of studies has also highlighted the adverse effects of psychological abuse in comparison to physical or sexual abuse (10), whereas others have emphasized abuse severity and the co-occurrence of different types of FV (7). But since most of the research on the subject has focused on finding direct correlations between FV and different well-being variables, the mechanisms underlying these discrepancies in research findings remain unknown. More complex analytical models could potentially yield valuable new insights on the subject as well as new interventional methods. For example, there has been a call for more research on the link between FV and sleep quality (21, 22).

Theoretical framework

Three possible pathways between FV, sleep quality and mental health have been identified. First, both psychological and physical FV have been shown to be strongly associated with decreased sleep quality. FV experiences have been linked with greater frequency of nightmares, difficulty in falling asleep, reduced sleep length, higher usage of sleep medication, more sleep disturbances, lower sleep efficiency and lower perceived quality of sleep (7, 11, 23, 24). A recent study by Miller-Graff and Cheng (25) suggests that sleep disturbances are a regulatory stress response that is most strongly associated with recent FV. However, abusive experiences in childhood have also been found to affect sleep quality either directly or indirectly (11, 25). Severity of abuse has also been associated with poorer sleep quality (26). These findings are in line with existing psychobiological theories that attribute sleep problems to disturbed neurobiological activity resulting from an acute threat (27, 28).

The second pathway connecting FV, sleep and mental health derives from the general importance of sleep for well-being. Sleep problems are associated with various health issues, such as cardiovascular and metabolic disorders, depression, anxiety, substance abuse and decrease in perceived quality of life (29, 30, 31, 32). Dolsen et al. (29) argue in their review that sleep problems are not only a comorbid symptom of various mental health disorders, such as depression, but also a separate transdiagnostic process that is related to mental health problems either causally or bidirectionally. This conclusion is supported by longitudinal studies showing that sleep problems both precede mental health disorders and expose people to them. Additionally, Dolsen et al. (29) state that while sleep-specific treatments have successfully alleviated comorbid mental health symptoms, disorder-specific treatments appear not to have had a similar effect on sleep problems.

The third potential pathway is the possible mediating effect of sleep quality on FV and mental health. Abused women have reported that FV has severely affected their sleep quality and that loss of sleep in turn has caused them various health problems and also

affected their ability to cope with FV (33). Some statistical evidence has been adduced for this mediation effect, although research on the phenomenon is scarce. For example, impaired sleep quality has been reported to influence the effects of generally violent or stressful experiences on mental health outcomes, such as depression and PTSD (22, 34). In one of the few studies focusing solely on FV, Pigeon et al. (35), in a sample of women exposed to FV, found that when adjusted for socio-demographic factors, abuse severity and PTSD symptoms, poor sleep quality significantly increased the risk for depressive symptoms. A large population-based study by Lalley-Chareczko et al. (36), in turn, concluded that the adverse mental health effects of exposure to physical or sexual violence or threats by an intimate partner were mediated by sleep quality, regardless of whether the violence was measured as life-time or past-year prevalence. In contrast, a study by Hernandez-Ruiz (37) provided somewhat mixed results, concluding that while music therapy effectively reduced anxiety levels and improved the sleep quality of sheltered FV survivors, the changes in these two outcome variables were not correlated.

Studies linking FV and sleep could help explain the mechanisms through which FV affects mental health and well-being. This knowledge could also facilitate the identification of violent experiences that might be causing sleep problems and lead to new possibilities for FV-related interventions. The preliminary and partially contradictory findings of the existing studies call for more research on the topic.

The current study

This study aimed to contribute to the literature on two different fronts. The first was to investigate the prevalence of FV and its effects on well-being among Finnish health-care professionals. The second was to add to the existing research-based knowledge on the connections between FV, sleep quality and mental health by exploring the possible mediation effect of sleep quality between FV and mental health. The specific research questions were:

1) How common are experiences of physical, sexual and psychological FV in the present sample of Finnish health care professionals?
2) Are FV experiences significantly associated with mental health outcomes?
3) Are the possible associations between FV and mental health mediated by sleep quality?

Method

Procedure

The data used in this study were originally collected in May 2010 as a part of a project promoting health and occupational well-being among employees of the Central Finland Health Care District (38). The data collection originated from the health care district's 2009-2013 action plan for health promotion. Although FV was not a special interest in this action plan, a few items addressing the issue were included in the study. A link to an anonymous web-based questionnaire with an accompanying cover letter was sent to all employees who at the time of the study had an official e-mail address provided by the health care district. In addition, printed questionnaires were delivered to some workplaces. The 52-item questionnaire measured the health, well-being and lifestyle of the participants, mainly with multiple-choice items with yes/no or Likert-scale response options. The items of interest for the present study were those measuring FV experiences, depressive symptoms, general mental health and sleep quality. The study was approved by the ethical committee of the Central Finland Health Care District.

Participants

A total of 1 952 persons, accounting for 54% of all the employees of the health care district, participated in the study. The sample demographics are displayed in Table 1. The approximate response rates for the different occupational groups were 45% for

physicians, 69% for nurses, 77% for the occupational group other 1 and 59% for the group other 2.

[Table 1]

Measures

Family violence. Participants were asked if they had ever experienced a) psychological, b) physical, or c) sexual FV. Three response options were given for each item: "yes", "don't know" and "no". Only the "yes" and "no" answers to each of the three items were included in the statistical analyses.

Depressive symptoms. Depressed mood was measured by three items: 1) "During the past two weeks, have you often been bothered by feeling down, depressed, or hopeless?" 2) "During the past two weeks, have you often been bothered by feeling little interest or pleasure in doing things?" and 3) "Do you need help regarding these issues?" All questions were dichotomous, with yes/no answer options. The first two questions follow the preliminary screening criteria for depression recommended by the Finnish Medical Society Duodecim and the Finnish Psychiatric Association (39). In this study, a participant was labeled as experiencing depressive symptoms if he/she had answered "yes" to either of these two questions and in addition felt a need for help. This definition was used to identify sub-clinical symptoms of depression in a sample that was known to have a relatively high level of well-being (38). A Cronbach's alpha resulted in a value of 0.70, indicating reasonable internal reliability for these three items. Additionally, deletion of any of the items would have resulted in a lower alpha value.

Mental health continuum short form (MHC-SF). The MHC-SF scale developed by Keyes (40) was used as a measure of general mental health. The internal reliability of the MHC-SF scale has been found to be high (>0.80) and it has been validated in several countries (40). The MHC-SF comprises 14 items distributed in three clusters of *emotional*,

social and *psychological well-being*. The response options for all items were "never", "once or twice", "about once a week", "about 2 or 3 times a week", "almost every day" and "every day". The responses were coded from 0 to 5, respectively. According to the criteria provided by Keyes (40), participants were first coded into three categories of mental health: *flourishing*, *moderate* and *languishing*. To be labeled as flourishing, a person must have answered "every day" or "almost every day" to at least one item in the first cluster and to a total of at least six items in the other two clusters. Accordingly, if a person answered "never" or "once or twice" to at least one item in the first cluster and to at least six items in the other two clusters, he/she was labeled as languishing. If the criteria for either of these two categories were not met, the person was labeled as having moderate mental health. Mean scores were also calculated for emotional, social and psychological well-being by dividing each total cluster score with the number of items on that cluster, resulting in a range of 0.00-5.00. The mean scores and their standard deviations were as follows: emotional well-being (M = 4.00, SD = 0.90), social well-being (M = 3.09, SD = 1.06) and psychological well-being (M = 3.91, SD = 0.86). The mean scores were z-standardized and used as separate outcome variables in further analyses.

***Sleep quality*.** In the original questionnaire, perceived sleep quality was measured by seven items, which had five Likert-scale response options ranging from "Completely disagree (1)" to "Completely agree (5)". The seven items, Q1-Q7, are displayed in Table 2. Confirmatory factor analysis (CFA) was performed using Mplus 8 (41) to find out whether the seven sleep-related items could be compressed into one variable for further analyses. The number of missing data patterns for the CFA was 6, resulting in a sample size of 1 946. The initial model, in which only factor loadings, factor variance and residual variances were included, did not show sufficient goodness-of-fit (RMSEA=0.14, CFI=0.88, TLI=0.82 and SRMR=0.06). According to the modification indices, covariances between the items were

included in the model until a satisfactory model fit was reached. The six residual covariances included were: Q1 with Q2 & Q3; Q7 with Q5, Q6 & Q3; and Q4 with Q6. The final model showed good fit (RMSEA=0.59, CFI=0.99, TLI=0.97 and SRMR=0.02). The factor loadings for each item are presented in Table 2. The factor scores were saved and z-standardized for further analyses.

Statistical Analysis

Statistical analyses were conducted using Mplus 8 and SPSS 24. In SPSS, missing data were excluded listwise. In Mplus, full-information maximum likelihood estimation (FIML) was used to capitalize on all available data. In FIML, missing values are assumed to be missing at random (MAR). The possibility for participants to skip questions in the questionnaire resulted in a listwise missing rate of 0.9% across all participants and all variables of interest.

The variables used in this study were not normally distributed, and thus the initial correlations between them were calculated using Kendall's Tau correlation coefficient. Due to some small cell counts, the cross tabulations used to analyze the connections between FV and the categorical dependent variables were performed using Monte Carlo simulation. Connections between FV and the continuous dependent variables were studied by one-way ANOVAs. The assumption of homogeneity of variances was not met for the variables measuring sleep quality, emotional well-being and psychological well-being. Thus, the ANOVAs were performed using bias-corrected bootstrapping (1000 iterations with 95% confidence intervals (CI)).

After establishing the direct effects between FV, sleep and mental health outcomes through ANOVAs and crosstabs, the possible mediation effects between these variables were analyzed by constructing mediator models with Mplus, using structural equation modeling (SEM). Different FV groups were recorded as dummy variables with the

"no violence" group as the reference group in the SEM analyses. For the continuous mental health variables (MHC-SF cluster scores), the significance of mediation paths was tested by generating bias-corrected bootstrap confidence intervals (1000 iterations, 95% CI) for indirect effects, as suggested by Preacher & Hayes (42). For the categorical mental health variables (depressive symptoms and MHC-SF classification), bootstrapping was not possible, and thus the corresponding mediator models were constructed using a Bayesian estimator (4 000 iterations with 95% credibility interval (CR)). The Bayesian estimator uses the probit link function to explain the dependent variable and handles the missing data in the same way as FIML.

Initial correlations between all the study variables are presented in Table 3. In the first step of specifying the mediator model, all covariates that correlated significantly with the respective dependent variable and/or sleep quality were included in the model. Next, non-significant covariate paths were removed from the model one by one starting from the variable with the highest *p*-value until the model included only significant covariate paths. For models including continuous dependent variables, the goodness-of-fit of the final model was evaluated using the RMSEA, CFI, TLI and SRMR measures. For the categorical mediator models, goodness-of-fit was evaluated using Bayesian posterior predictive checks (43). R^2 values were reported as a measure of effect size. In the categorical mediator models, the R^2 values were calculated for the latent continuous dependent variable y*, which has a linear relationship with the independent variable x (44).

[Table 3]

Results

A total of eight different combinations of FV were identified in the data and are presented in Table 4. The two smallest groups, "physical & sexual FV" and "sexual FV only", contained so few cases that they were omitted from all further statistical analyses.

Cross tabulation showed a significant gender difference within the FV groups ($\chi^2(7) = 40.31$, $p < 0.001$). As can be seen from the adjusted residuals displayed in Table 4, the number of women was significantly lower in the "no violence" group and significantly higher in the groups "psychological FV only", psychological & physical FV" and "psychological, physical & sexual FV". However, in the further statistical analyses, specific gender comparisons were not made as the sample contained only two men who had reported sexual FV.

[Table 4]

Family Violence and Well-Being

The associations between FV and the categorical mental health variables are presented in Table 5. Cross tabulations revealed significant differences between the analyzed FV groups in both depressive symptoms ($\chi^2(5) = 22.24$, $p < 0.001$) and MHC-SF classification ($\chi^2(10) = 23.73$, $p = 0.008$). As can be seen from the adjusted residuals, the participants with no experiences of FV scored better on both measures, reporting significantly less depressive symptoms and a higher MHC-SF classification. "Psychological FV only" was the only group associated with more depressive symptoms as well as a lower MHC-SF classification, whereas "physical FV only" showed no statistically significant connections with these measures. For the other FV groups, the results were more inconsistent, with "psychological & physical FV" and "psychological & sexual FV" showing a significant link with depressive symptoms but not with the MHC-SF classification. All three FV types combined were, in turn, significantly associated with a lower MHC-SF classification but not with depressive symptoms.

[Table 5]

One-way ANOVAs were conducted to investigate the effect of FV on sleep quality and the MHC-SF cluster scores. The results and post-hoc group comparisons are presented in Table 6. The ANOVAs showed a statistically significant difference between the six FV

groups for both sleep quality ($p = 0.001$), emotional well-being ($p < 0.001$), social well-being ($p < 0.001$) and psychological well-being ($p = 0.008$). The effect sizes for these models were small ($\eta^2 = 0.008$-0.015). Tukey post-hoc tests with Bonferroni correction revealed a significant difference between the "no violence" and "psychological FV only" groups in sleep quality ($p = 0.001$), emotional well-being ($p = 0.001$), social well-being ($p < 0.001$) and psychological well-being ($p = 0.031$). In addition, the "psychological, physical & sexual abuse" group differed significantly from the "no violence" group in emotional well-being ($p = 0.041$). Other differences between the FV groups were not statistically significant.

[Table 6]

Sleep as a Mediator

The mediator models used for testing the relationships between FV, sleep and mental health variables are outlined in Figure 1. *Path a* represents the direct effect of independent variables X on sleep quality and *path b* the direct effect of sleep quality on dependent mental health variables Y. The indirect *path a*b* represents the effect of X on Y through the mediating variable M. The total causal effect of X on Y is composed of the indirect effect and the direct effect of X on Y (*path c'*).

The hypothesized mediation effects were tested separately for each dependent variable. The categorical covariates included in the initial mediator models were age and form of employment for depressive symptoms; gender, age, form of employment and occupation for MHC-SF classification; age, form of employment and occupation for emotional and psychological well-being and age, form of employment, nature of work, working hours and occupation for social well-being. Of the 25 possible indirect paths (*path a*b*), only those including the groups "psychological FV only" and "psychological & physical FV" yielded significant results. Additionally, the group "psychological, physical & sexual FV" had a significant direct effect on MHC-SF classification and emotional well-

being, but these effects were not mediated by sleep quality. These final mediator models with their path coefficients, significant covariates and goodness-of-fit indices are presented in Figures 2-6. The indirect effects are displayed in Table 7. The mediation models explained 12-21% of the variance in dependent variables. For depressive symptoms, both mediation effects were partial since the direct paths *c'* remained significant after controlling for the indirect effect. For MHC-SF classification, both mediation effects were complete since the direct paths *c'* became insignificant. For emotional, social and psychological well-being, the mediation effects were partial for the group "psychological FV only" and complete for "psychological & physical FV".

[Figure 1]

[Figure 2]

[Figure 3]

[Figure 4]

[Figure 5]

[Figure 6]

[Table 7]

Discussion

Principal Findings

The first aim of this study was to investigate the prevalence and effects of FV in a sample of health care professionals. The total prevalence rate of FV in this sample was 38%, which is somewhat higher than previously found among Scandinavian health care professionals (15,16) but not as high as the total prevalence of FV in Finnish population-based samples (3, 4, 6). The present findings thus indicate that FV is a common issue among Finnish health care professionals. However, since the present data were collected in only one hospital

district, further studies are needed to ascertain whether FV experiences are equally as common among health care professionals elsewhere in Finland. The present participants with a history of FV reported more depressive symptoms, scored worse on the MHC-SF scale and rated their sleep quality lower than those who reported never experiencing FV. The most significant contributor to these negative effects was psychological abuse, which alone was significantly associated with all outcome variables used in the study. For other forms of FV the results were more inconsistent. These findings are compatible with previous studies emphasizing the adverse effects of FV and especially psychological abuse (10).

The second aim of the study was to investigate whether the harmful effects of FV could be mediated by sleep quality. Previous studies have established that FV has a negative effect on sleep and that sleep quality is in turn associated with physical and mental health (23, 24, 26, 32). In the present study, sleep quality was found to be a significant mediator between FV and depressive symptoms, MHC-SF classification and MHC-SF cluster scores, thus supporting the previous findings by Pigeon et al. (35) and Lalley-Chareczko et al. (36). However, significant mediation effects were found for only two abuse groups, namely "psychological FV only" and "psychological & physical FV". These differences are interesting and prompt speculation on the possible reasons.

First, it is possible that the proposed mediation model between FV, sleep and mental health is unique to psychological abuse even when it is combined with other forms of FV. This could help to explain the harmfulness of psychological abuse. Previously it has been argued that psychological FV, which includes elements of domination and belittling, could have a more significant impact on the personality of victims than physical or sexual abuse (9). Psychological abuse might also lead to prolonged and cumulative exposure to FV because people experiencing psychological FV might be less likely to seek help – either because they do not see psychological abuse as serious enough or because controlling abuse

limits their access to support (10). Some or all of these mechanisms could be manifested in proposed mediation model. The previous studies conducted on the subject by Pigeon et al. (35) and Lalley-Chareczko et al. (36) did not distinguish between different forms of FV, and hence it is possible that the mediation effects found in these two studies were also mainly related to psychological abuse.

However, the differences found in the present study could also be influenced by additional factors, such as the duration, timing or severity of FV. For example, less recent occurrence of abuse could explain why the mental health effects of all three FV types combined were not mediated by sleep quality, despite the co-existence of psychological abuse in this group. The present findings might also be affected by statistical factors, since "psychological FV only" and "psychological & physical FV" were the most common abuse groups in the sample. This may have caused their effects to be overestimated (type I error) and/or the effects of the other FV groups to be underestimated (type II error). Additionally, while the investigated mediator models were controlled for gender, age, form of employment, occupation, nature of work and working hours, the possibility remains that other variables not included in the present models could have influenced the observed direct or indirect effects. Such potentially mediating or moderating variables identified in previous research include PTSD symptoms, anxiety and physical health (11, 24, 26). Thus, more research is needed to support the present findings as well as explain them.

Strengths and Limitations

The present study is one of the first to investigate FV experiences among Finnish health care professionals, although it should be noted that the topic has thus far received little research attention elsewhere. Gaining more accurate and up-to-date information on health care professionals' personal experiences of FV is important since such experiences can affect not only their personal health and well-being but also their

performance at work. The present study was also one of the first to analyze the possible mediating effect of sleep on the mental health effects of FV. This is a new and promising direction in FV research. The study design included several measures of mental health and comparisons were made between psychological, physical and sexual FV. SEM provided a powerful tool for estimating the associations and possible mediation effects between the variables of interest. The sample used in the study was large and it provided new insights into how FV affects professionals with a relatively high level of health and well-being. However, the study also has several limitations that need to be addressed.

First, the effect sizes for the direct and indirect effects found were relatively small, which means that the findings on the proposed mediation model should be considered preliminary only. Secondly, the sample used in this study did not enable identification of precisely when the FV had occurred or who the perpetrator was. As a result, participants reporting FV experiences may have had very different abuse backgrounds, rendering the comparability of these experiences debatable. However, as the literature demonstrates, the effects of FV on adult health and well-being are very similar regardless of whether the abuse has been experienced in childhood or adulthood (see e.g. Dillon et al. (7) and Hillis et al. (9)). On the reliability of using a lifetime definition of FV, it can be argued that possible recall bias may lead to under- rather than overestimation (8). Thus, it is likely that a sample comprising only more recent experiences of FV would have produced even more significant effects with larger effect sizes. The same applies to the lack of more specific definitions of FV in the data collection questionnaire, since people do not necessarily recognize all their abusive experiences as FV. This might be especially true for psychological abuse. Another limitation is that owing to the relatively small number of persons reporting physical or sexual abuse in the sample, the comparisons between the different FV groups were not as comprehensive as

they could be. The same is true for the small number of men reporting FV, which made it impossible to perform more detailed gender comparisons within the sample.

Policy and Research Implications

The findings of this study demonstrate that FV can significantly affect the well-being of health care professionals. However, screening and intervention procedures for FV are practically non-existent both among people employed in health care services and in occupational health care settings in general. To more effectively reduce the personal and societal costs of FV, it should be addressed more actively in the context of various low-threshold services, including occupational health care. This is especially important in the case of health care professionals, since processing their own FV experiences could have cumulative positive effects on the extent and modes of treatment provided to patients (13, 14, 15). Health care professionals should thus be made more aware of the adverse effects of FV, educated in the recognition and treatment of FV and supported in dealing with their own experiences of FV.

The present study also provides interesting implications for FV-related interventions. The mediation effects found suggest that the mental health of FV survivors could be improved by focusing on their sleep quality. This could be a new and relatively straightforward and practical way of helping people who suffer from the adverse consequences of FV, although other supportive and preventive measures remain greatly needed to reduce the prevalence and harmful effects of FV. Sleep-related interventions have been shown to be successful among other populations with mental health issues (29), while few treatment trials targeted specifically to FV survivors have also been conducted or are in process (37, 45). However, further studies on the subject are needed before more precise suggestions and recommendations for FV-related interventions can be made. Future studies on the subject should include a population-based sample, more precise definitions regarding

the severity, perpetrators and timing of FV, and additional measures of mental health and well-being.

Conclusions

The purpose of this study was to contribute to the literature on FV and to examine its consequences for mental health among health care professionals. The findings demonstrate that FV experiences have a significant effect on the well-being of health care professionals. To reduce both the personal and financial costs resulting from impaired mental health and well-being, FV should be regarded as one health risk among others and addressed more effectively in occupational health care settings and other low-threshold services. The present study also provided a possible explanatory mechanism for the adverse effects of FV, namely the mediating effect of sleep quality. These findings point to interesting possibilities for services aimed at helping FV survivors; for example, interventions focusing on sleep quality could help to attenuate the adverse consequences of FV. However, more research is needed to fully establish the connections between FV, mental health and sleep quality found in this study.

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Author contribution

All authors contributed to the study design. MH contributed to data collection. HS contributed to the statistical analyses and drafting of the manuscript. JH supervised and reviewed the drafting of the manuscript.

Ethical approval

The study was approved by the Ethical Committee of the University of Jyväskylä (20.06.2011) and a research permit for the study was received from the Central Finland Health Care District (10.11.2011).

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Table 1

Sample demographics (N=1 952)

	f	%
Gender		
Women	1 684	86.3
Men	268	13.7
Age		
≤ 30	316	16.2
31-40	373	19.1
41-50	623	31.9
51-60	556	28.5
≥ 61	84	4.3
Form of employment		
Permanent	1 463	74.9
Fixed-term	489	25.1
Nature of work		
Full-time	1 778	91.1
Part-time	174	8.9
Working hours		
One-shift	944	48.4
Two-shift	277	14.2
Three-shift or night work	642	32.9
Other	89	4.6
Occupation		

Table 1

Continued

	f	%
Doctor	131	6.7
Nurse	1 102	56.5
Other 1	440	22.5
Other 2	279	14.3

Note. Other1 = Research and therapy staff, research and therapy assistants, office staff, IT staff. Other2 = Cleaning, cooking, laundry, technical, storage and logistic staff.

Table 2

Standardized and unstandardized coefficients for CFA

Item	β	B	SE
Q1: I get enough sleep	0.65	1.00	-
Q2: I sleep well	0.91	1.38	0.04
Q3: I feel alert when I wake up	0.63	0.96	0.04
Q4: I fall asleep easily	0.62	0.93	0.04
Q5: I sleep without waking up during the night	0.72	1.28	0.06
Q6: I easily fall asleep again if I wake up during the night	0.70	1.08	0.05
Q7: I don't normally wake up earlier than usual (before my alarm clock goes off)	0.48	0.87	0.05

Note. CFA = Confirmatory factory analysis. SE = Standard error.

Table 3

Correlations between study variables (N = 1 942)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	-												
2. Age	-0.038	-											
3. Form of employment	-0.032	0.378***	-										
4. Nature of work	0.062**	-0.012	0.097***	-									
5. Working hours	-0.009	-0.190***	-0.119***	-0.002	-								
6. Occupation	0.000	0.186***	0.096***	0.020	-0.368***	-							
7. Family violence	-0.137***	0.006	-0.044*	-0.025	0.051*	-0.002	-						
8. Depressive symptoms	0.011	0.001	0.030	-0.036	-0.028	-0.007	0.088***	-					
9. MHC-SF classification	-0.059**	-0.045*	-0.041	-0.006	-0.007	-0.078***	-0.048*	-0.252***	-				
10. Sleep quality	-0.002	-0.084***	-0.077***	0.021	0.002	0.010	-0.066***	-0.197***	0.237***	-			
11. Emotional well-being	-0.031	-0.074***	-0.074***	-0.034	-0.007	-0.052**	-0.055**	-0.225***	0.545***	0.273**	-		
12. Social well-being	-0.033	-0.051**	-0.043*	0.006	-0.036*	-0.065***	-0.067***	-0.163***	0.548***	0.217**	0.422***	-	

Table 3

Continued

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
13. Psychological well-being	-0.034	-0.062**	-0.082***	-0.018	-0.006	-0.074***	-0.049**	-0.204***	0.622***	0.249**	0.514***	0.493***	-

*$p < .05$, **$p < .01$, ***$p < .001$

Table 4

Frequency of FV

FV type	All (*N* = 1 951)	Women (*N* = 1 683)	Men (*N* = 268)
No violence	62.2 %	59.5%†	78.7 %††
Psychological only	18.5 %	19.4 %††	12.7 %†
Psychological & physical	12.3. %	13.1. %††	7.1 %†
Psychological, physical & sexual	3.6 %	4.2 %††	0.4 %†
Physical only	1.8 %	2.0 %	0.7 %
Psychological & sexual	1.2 %	1.3 %	0.4 %
Physical & sexual[a]	0.1 %	0.1 %	-
Sexual only[a]	0.4 %	0.4 %	-

[a]Excluded from further analyses

†Adjusted residual ≤ -2.0. ††Adjusted residual ≥ 2.0

Table 5

FV, depressive symptoms and MHC-SF classification

	Depressive symptoms	MHC-SF classification		
	(*N* = 1 940)	(*N* = 1 934)		
FV type		*Flourishing*	*Moderate*	*Languishing*
No violence	5.0 %†	68.8 %††	30.3 %	0.9 %†
Psychological only	9.4 %††	63.3 %	32.8 %	3.9 %††
Psychological & physical	11.3 %††	67.1 %	30.0 %	2.9 %
Psychological, physical & sexual	8.5 %	54.9 %†	42.3 %††	2.8 %
Physical only	5.7 %	71.4 %	25.7 %	2.9 %
Psychological & sexual	17.4 % ††	62.5 %	34.8 %	0.0 %

†Adjusted residual ≤ -2.0. ††Adjusted residual ≥ 2.0

Table 6

ANOVA analyses for sleep quality and MHC-SF cluster scores

Variable	FV 1		FV 2		FV 3		FV 4		FV 5		FV 6						
	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)	M	(SD)	*F*	(df1, df2)	*p*	η^2	*N*
Sleep quality	-0.17	(1.07)	-0.08	(1.01)	-0.13	(1.01)	-0.24	(1.18)	0.23	(.93)	0.07	(0.97)	4.44	(1936, 1941)	.001	.011	1 942
Emotional well-being	-0.18	(1.09)	-0.22	(1.06)	-0.29	(1.16)	-0.14	(1.19)	0.20	(.80)	0.07	(0.94)	5.09	(1928, 1933)	.000	.013	1 934
Social well-being	-0.18	(0.99)	-0.09	(.1.01)	-0.26	(1.10)	-0.03	(1.00)	0.26	(1.01	0.08	(0.98)	5.77	(1928, 1933)	.000	.015	1 934
Psychological well-being	-0.12	(1.07)	-0.07	(1.05)	-0.25	(1.28)	0.04	(0.85)	0.02	(.94)	0.06	(0.95)	3.15	(1928, 1933)	.008	.008	1 934

Continued

	Sleep quality	Emotional well-being	Social well-being	Psychological well-being
Pairwise comparisons	FV 6 > FV 1	FV6 > FV 1, FV 3	FV 6 > FV 1	FV 6 > FV 1

Note. Pairwise comparisons column shows which group differences are statistically significant at $p < .05$ (with Bonferroni correction).

FV 1 = Psychological only. FV 2 = Psychological & physical. FV 3 = Psychological, physical & sexual. FV 4 = Psychological & sexual.

Table 6

Continued

Note. FV 5 = Physical only. FV 6 = No violence.

Table 7

Standardized indirect effects within the final mediation models

	Depression[a]		MHC-SF classification[a]		Emotional well-being		Social well-being		Psychological well-being	
	Estimate	[95% CR]	Estimate	[95% CR]	Estimate	[95% CI]	Estimate	[95% CI]	Estimate	[95% CI]
Psychological FV	0.11	**[0.06, 0.17]**	-0.09	**[-0.14, -0.05]**	-0.03	**[-0.05. -0.02]**	-0.03	**[-0.04, -0.01]**	-0.03	**[-0.05, -0.01]**
Psychological & physical FV	0.07	**[0.01, 0.13]**	-0.06	**[-0.12, -0.01]**	-0.02	**[-0.04, -0.00]**	-0.02	**[-0.03, -0.00]**	-0.02	**[-0.03, -0.00]**
Psychological, physical & sexual FV	-	-	-0.08	[-0.16, 0.01]	-0.01	[-0.03, 0.00]	-	-	-	-

Note. CR (credibility interval) and CI (confidence interval) ranges in bold are statistically significant.

[a]Non-standardized values

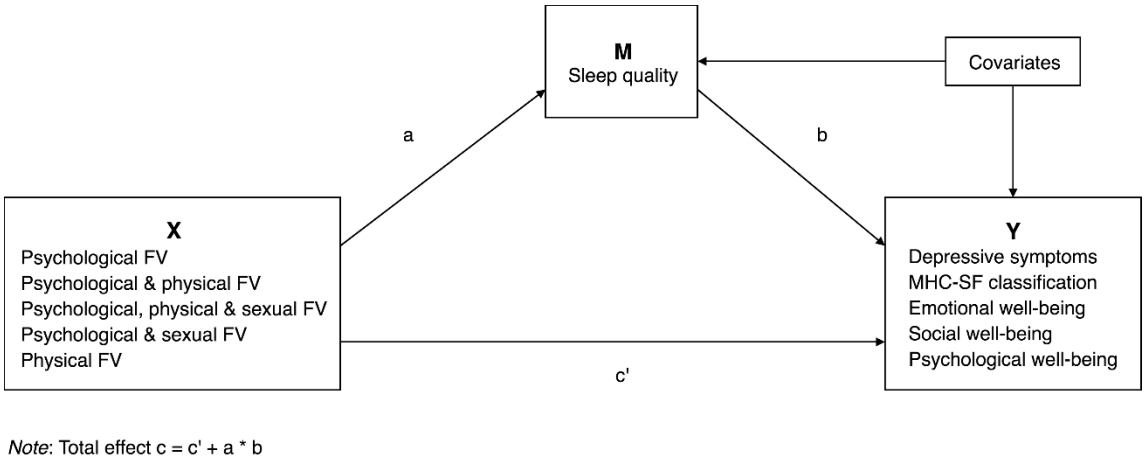

Figure 1: The proposed mediation models between family violence, sleep quality and mental health.

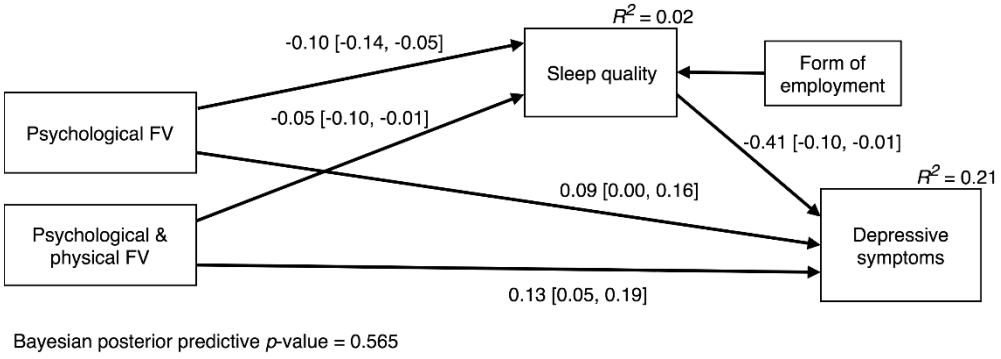

Figure 2: Final mediation model for depressive symptoms with standardized Bayesian estimates and 95% credibility intervals of the estimates.

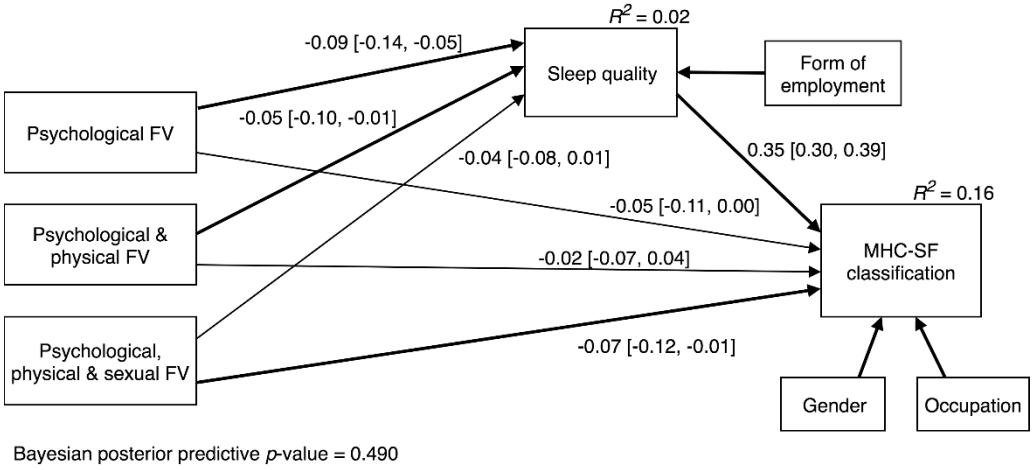

Figure 3: Final mediation model for MHC-SF classification with standardized Bayesian estimates and 95% credibility intervals of the estimates.

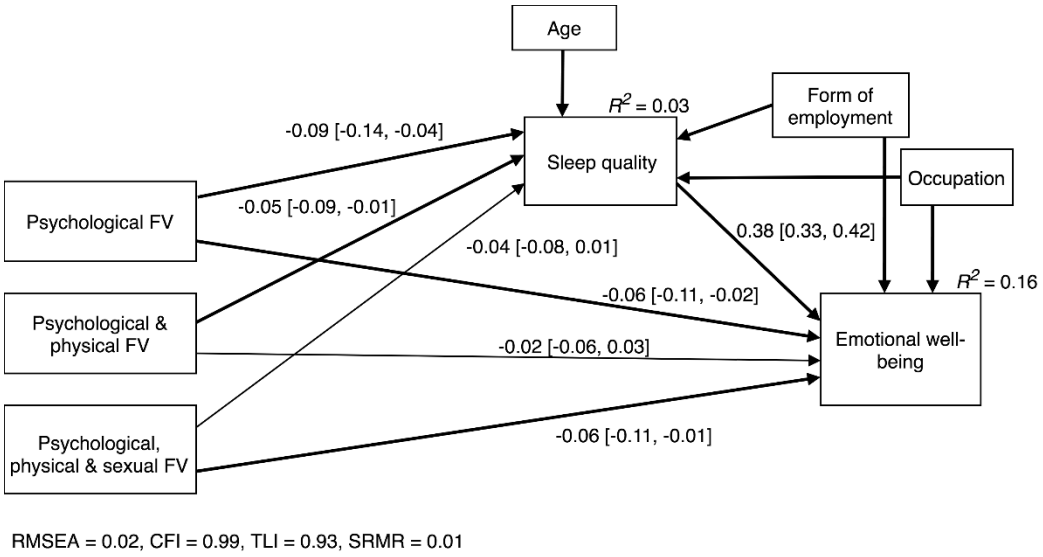

Figure 4: Final mediation model for emotional well-being with standardized bias-corrected bootstrap estimates and 95% confidence intervals of the estimates.

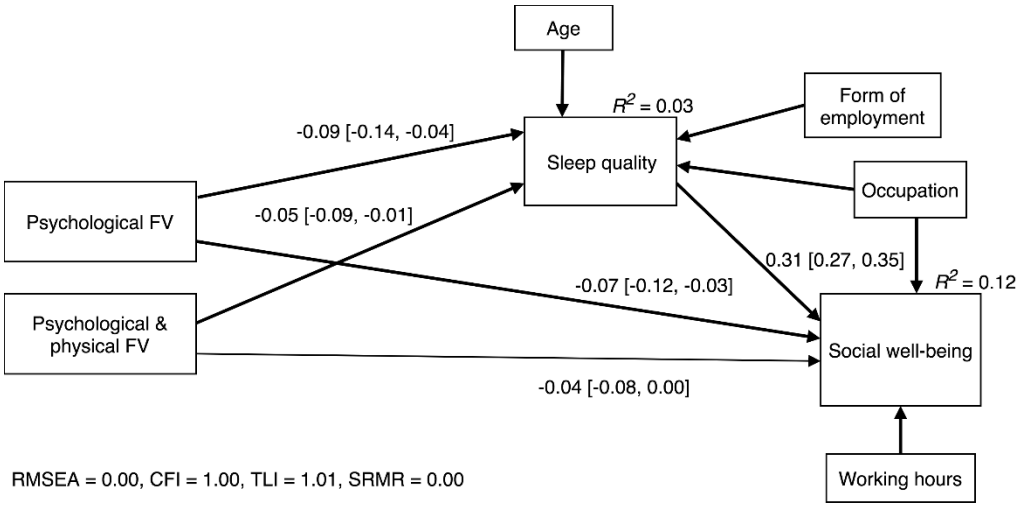

Figure 5: Final mediation model for social well-being with standardized bias-corrected bootstrap estimates and 95% confidence intervals of the estimates.

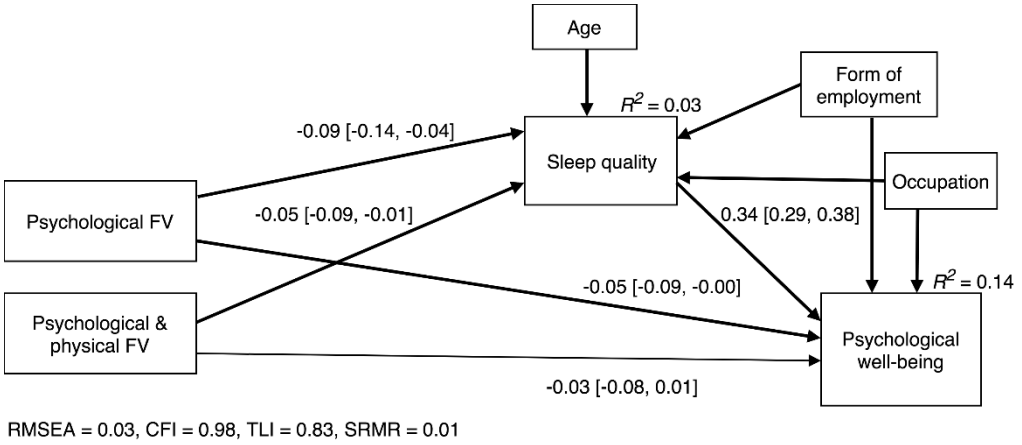

Figure 6: Final mediation model for psychological well-being with standardized bias-corrected bootstrap estimates and 95% confidence intervals of the estimates.

Appendix

Table A1

MHC-SF questionnaire

Cluster	Items
	"During the past month, how often did you feel…"
Emotional well-being	1. happy?
	2. interested in life?
	3. satisfied with life?
Social well-being	4. that you had something important to contribute to society?
	5. that you belonged to a community (for example at your workplace or a social group)?
	6. that our society is becoming a better place?
	7. that people are basically good?
	8. that the way our society works makes sense to me?
Psychological well-being	9. that you liked most parts of your personality?
	10. good at managing the responsibilities of your daily life?
	11. that you had a warm and trusting relationships with others?
	12. that you had experiences that challenged you to grow and to become a better person?
	13. confident to think or express your own ideas and opinions?
	14. that your life has a sense of direction or meaning to it?

II

VICTIMS OF FAMILY VIOLENCE IDENTIFIED IN EMERGENCY CARE: COMPARISONS OF MENTAL HEALTH AND SOMATIC DIAGNOSES WITH OTHER VICTIMS OF INTERPERSONAL VIOLENCE BY A RETROSPECTIVE CHART REVIEW

by

Heli Siltala, Anneli Kuusinen-Laukkala & Juha Holma, September 2020

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Victims of family violence identified in emergency care: Comparisons of mental health and somatic diagnoses with other victims of interpersonal violence by a retrospective chart review

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ABSTRACT

Family violence is a global health problem incurring significant costs to both individuals and health care systems. However, family violence as a cause of trauma and other health issues is often unidentified in patients attending emergency care. Better understanding of the risk factors associated with family violence could improve the identification and treatment of victimized patients in health care settings. Little longitudinal research exists on the mental and somatic health of family violence victims currently identified in EDs and little is known about how victims of family violence differ from other help-seeking victims of interpersonal violence. A total of 345 patients were identified as victims of interpersonal violence in a mid-size Finnish ED during the period 2011–2014. A retrospective chart review was conducted to analyze their mental and somatic health two years before and two years after identification. Victims of family violence were most likely women and they were significantly older than other victim groups. Victims of family violence also presented the most varied health symptoms both before and after identification, although differences between victim groups were not as clear as in previous studies comparing victims of family violence with non-victims. Comparison with previous data demonstrated that family violence was severely under-identified at the study site, further increasing the likelihood of family violence victims revisiting health care services. More attention should thus be paid to the identification and treatment of family violence in emergency care and other health care settings.

1. Introduction

Family violence is a serious health issue negatively impacting both individual and societal well-being. Globally, 23–38% of women have experienced physical or sexual violence by their intimate partner and 42% of them have sustained injuries (García-Moreno et al., 2013). The most recent population-based study conducted in Finland by Heiskanen and Ruuskanen (2010) showed that 17% of women have been abused by their current partner and 42% by a previous partner, the respective numbers for men being 16% and 22%. Annually, about one in ten Finnish citizens are subjected to violence, with women experiencing most often family violence and sexual violence and men other forms of interpersonal violence. Furthermore, over 20% of family violence victims but less than 10% of other victims report having been assaulted more than 10 times during their lives. Although family violence is at least as common as other violent crime, its costs to society and prevention tend to be discussed less. Besides acute injuries, family violence has been shown to have various long-lasting effects, such as poorer functional and self-reported health, backache, stomach pain, headache, psychosomatic symptoms, obstetrical and gynecological issues, sleep problems, memory loss and dizziness (Dillon et al., 2013; García-Moreno et al., 2013). The most common mental health issues linked with family violence are depression, anxiety and PTSD (Bazargan-Hejazi et al., 2014; Dillon et al., 2013; Hegarty et al., 2013). Victims of family violence are also known to be more suicidal and to have more substance abuse issues than the general population (Beydoun et al., 2017; Dillon et al., 2013; García-Moreno et al., 2013). Repetitive victimization has been associated with the severity of mental health issues resulting from violence (Cougle et al., 2009; Dillon et al., 2013) and thus the health effects caused by family violence are likely to be longer-lasting and more detrimental than those of other violence. Victims of family violence and sexual violence have also been found to experience more psychological distress than victims of non-sexual and non-intimate assaults (Youstin and Siddique, 2018).

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While only a minority of victims of interpersonal violence seek help (Heiskanen and Ruuskanen, 2010), the numerous health impairments associated with family violence cause its victims to use health care services more often than the general population (Dillon et al., 2013; Hegarty et al., 2013; Hoelle et al., 2015). These services include EDs and trauma centers, where 1–8% of all visits (Farchi et al., 2013; Hegarty et al., 2013; Notko et al., 2011; Parekh et al., 2012) and 13% of assault-related visits (Yau et al., 2013) have been found to be direct outcomes of family violence. Moreover, 8–20% of patients presenting to EDs have experienced family violence within the past year and 16–40% during their lifetime (Bazargan-Hejazi et al., 2014; Sprague et al., 2014; Zachary et al., 2001). In Finland, 7% of ED patients have reported recent and 20% life-time family violence (Notko et al., 2011). Thus, emergency care could be a significant intervention point for victims of family violence. However, the majority of family violence victims are likely to remain unidentified in the day-to-day practices of EDs (Hinsliff-Smith and McGarry, 2017) while those who are identified have typically already suffered several assaults (Farchi et al., 2013; Leppäkoski et al., 2011). After their identification, many victims also revisit EDs (Dichter et al., 2018; Hoelle et al., 2015; Rivara et al., 2007), a situation that further highlights the need for more efficient family violence interventions in emergency care. Currently it seems that most family violence victims identified "naturally" in EDs are diagnosed with external injuries (Davidov et al., 2015; Farchi et al., 2013). This, however, fails to account for the majority of victims, who present to EDs with other issues, such as infections, obstetrical and gynecological complaints, pain and mental health problems (Farchi et al., 2013; Hoelle et al., 2015; Zachary et al., 2001). Additionally, studies have demonstrated that physical injuries resulting from family violence are not significantly different from those sustained by other victims of violence (Reijnders and Ceelen, 2014; Yau et al., 2013).

Electronic patient systems could potentially be applied to prompt care providers to ask about family violence in high-risk cases (Miller et al., 2015). This might significantly shorten the delay in the identification of family violence victims. For example, Reis and colleagues (2009) reported that their predictive model was able to identify high-risk patients 27–34 months before family violence was identified. The risk factors identified in the few existing longitudinal studies include external injuries, a higher frequency of health care visits (especially to EDs), headache, urinary tract infections, prenatal complications, STDs, HIV concerns, substance abuse and previous, non-recent experiences of family violence (Bhargava et al., 2011; Eaton et al., 2016; Reis et al., 2009). The predictive value of these markers has, however, been inconsistent. While several studies have found mental health issues to predict family violence identification (Bhargava et al., 2011; Eaton et al., 2016; Reis et al., 2009), conflicting results have also been reported (Hoelle et al., 2015). Predictors of family violence have also been noted to differ depending on the victim's age and gender (Bhargava et al., 2011; Eaton et al., 2016; Reis et al., 2009). It seems that women are more likely to experience family violence and to seek treatment for injuries resulting from family violence, whereas men are more likely to experience other violence and to seek medical treatment for injuries resulting from non-familial violence (Hamberger and Larsen, 2015; Heiskanen and Ruuskanen, 2010; Yau et al., 2013). To our knowledge, no previous studies have directly compared the predictive factors between family violence, sexual violence and other violence using longitudinal data.

Additionally, little longitudinal research has addressed the mental and somatic health of family violence victims naturally identified in EDs and no such studies have been conducted in Finland. This study contributes to filling an important gap in violence research and improve understanding of the ways in which victims of family violence differ from other victims of interpersonal violence.

Our first research question concerns possible differences between victim groups on their identification date. We predict that identification of victims of interpersonal violence in emergency care is based on injuries and thus no significant somatic differences can be detected between violence groups on their identification date (H1). Our second research question concerns the health effects of interpersonal violence. We predict that the health effects of family violence are longer-lasting and more detrimental than those of other forms of violence (H2). Finally, our third research question concerns possible predictors of family violence. We predict that specific health symptoms can be identified as predictors of family violence (H3).

2. Method

2.1. Data and procedure

The study was conducted in a middle-sized Finnish central hospital. The sample for retrospective chart review included all patients who visited the hospital's ED in 2011–2014 and were assigned an ICD-10 diagnosis code indicating interpersonal violence. Initially, 518 patients were identified but after removing falsely identified accident victims (n = 120), patients whose medical records were out of reach due to residence in other municipality (n = 22) and children under 16 years of

Table 1
Sample descriptives and adjusted residuals for crosstab analyses. Research conducted in Finland 2011–2014.

Variable	All (N = 345)		Family violence (N = 111)		Sexual violence (N = 32)		Other violence (N = 202)	
Gender*								
Women	53.3%		90.1%$^{+}$		100%$^{+}$		25.7%$^{-}$	
Men	46.7%		9.9%$^{-}$		0%$^{-}$		74.3%$^{+}$	
Age group*								
16–17	4.3%		1.8%		18.8%$^{+}$		3.5%	
18–30	52.8%		43.2%$^{-}$		71.9%$^{+}$		55.0%	
31–50	29.6%		36.9%$^{+}$		6.3%$^{-}$		29.2%	
≥51	13.3%		18.0%		3.1%		12.4%	
Any diagnosis before*	83.5%		89.2%$^{+}$		93.8%		78.7%$^{-}$	
Any diagnosis after[a]	90.7%		91.9%		100%		88.6%	
Mental health diagnosis before	38.8%		39.6%		56.3%$^{+}$		35.6%	
Mental health diagnosis after[b]	51.9%		60.4%		62.5%		64.4%	
Age* M (SD)	32.0	(13.12)	34.8	(13.62)	23.6	(1.66)	31.9	(12.81)

M = mean, SD = standard deviation.
* Significant group difference ($p < .001$).
[a] Identification date excluded.
[b] Identification date included.
$^{+}$ Adjusted residual ≥ 2.0.
$^{-}$ Adjusted residual ≤ −2.0.

age (n = 31), the final sample for analysis was 345. This covers 0.1% of the total 340 308 ED visits recorded during the study period. Descriptive information on the final sample is presented in Table 1. The sample contained slightly more women than men. Mean participant age was 32.0 years (range 16 – 86 years). Based on the recorded date of identification, a participant was labelled as having experienced family violence if the perpetrator was reported to be a spouse, ex-spouse, dating partner, child, parent or other family member of the patient. Two family violence patients reported experiencing sexual violence, one psychological violence and the remainder physical violence. Participants seeking help due to sexual assault by an unknown perpetrator were assigned to the sexual violence group. The remaining participants reporting physical assault by a non-family perpetrator were labelled as having experienced other violence. Diagnostic variables at the date of identification and during the preceding and following 24 months were retrieved from medical records. Health outcomes were grouped according to the ICD-10 main categories (I-XXII), except that normal childbirth was separated from pregnancy with complications, yielding 23 main diagnostic categories. For the purpose of this paper, the ICD-10 diagnostic category XXI including medical examinations, contact for counselling and additional codes for socioeconomic and psychosocial concerns is referred to as “other diagnoses”. Mental health diagnoses were first investigated together as one of the main categories and then in more detail by constructing separate variables for all 11 ICD-10 diagnostic groups F0-F99. Separate variables were also constructed for symptoms and health issues known to be associated with family violence but which are scattered across several different ICD-10 main categories. These included STDs, nutritional problems, neurological symptoms, sleep disturbances and pain. A dichotomous yes/no coding, indicating whether a participant had experienced each of the health outcomes during the studied time periods, was used for all diagnostic variables.

2.2. Statistical analysis

In the first part of the analysis, the dependent variable was violence type and the independent variables were gender, age and the different ICD-10 diagnostic categories. Differences between the three violence groups in gender and the diagnostic variables were analyzed using crosstabs. To reduce the chance of type I errors, statistically significant differences were reported only for diagnostic variables for which at least one of the violence groups contained not less than 10 positively identified cases. To avoid type II errors, variables that indicated significant differences in crosstabs (adjusted residual (AR) $\geq$ 2.0 or ≤ -2.0 and $n \geq 10$) were reported even in cases where the overall chi-square test between the three violence groups was non-significant. Because the data contained several significant outliers and Levene’s test indicated unequal variances between the violence groups (F = 6.42, p = .002), the non-parametric Kruskal-Wallis test was used to analyze between-group age differences. Significance values for post-hoc comparisons were adjusted by Bonferroni correction for multiple tests. In the second part of the analysis, multinomial logistic regression was used to investigate variables predictive of violence classification, with violence type as the dependent variable and family violence as the reference category. Possible predictors were initially identified in the first part of the analysis and variables that indicated significant differences between two or more violence groups (p < .05 or AR $\geq$ 2.0/≤ -2.0 in one or more crosstab cells) were then tested for multicollinearity. Predictors with no multicollinearity issues were entered one by one to the logistic regression model as independent variables. At each step, non-significant predictors that produced no pairwise differences between violence groups were removed from the model.

3. Results

3.1. Group differences on the identification date

Descriptive information on the sample is presented in Table 1, including significant ARs for the crosstab analyses. 32.2% of the identified patients came to the ED owing to family violence, 9.3% to sexual violence and 58.6% to other violence. All the victims of sexual violence and 90.1% of the family violence victims were women, whereas 74.3% of the other victims were men. These gender differences were statistically significant ($\chi^2(2)$ = 150.04, p < .001).

The Kruskall-Wallis tests indicated a significant age difference between the three violence groups ($\chi^2(2)$ = 24.59, p < .001), with mean ranks of 194.28 for family violence, 173.64 for other violence and 95.16 for sexual violence. Post-hoc analyses showed that victims of sexual violence were significantly younger than victims of family violence (p < .001) or other violence (p < .001) but the age difference between victims of family violence and other violence was non-significant (p = .239).

On their identification date, 79.1% of all victims had been diagnosed with injuries, but only 4.6% assigned a more specific code for the external cause of the injury (e.g., family violence). Women experiencing family violence ($\chi^2(2)$ = 89.62, p < .001; AR = 5.6) and men experiencing other violence ($\chi^2(1)$ = 9.21, p = .002; AR = 3.0) were more likely to be diagnosed with injuries than other groups. Victims of sexual violence, in turn, were diagnosed with injuries less often than other violence groups ($\chi^2(2)$ = 89.62, p < .001; AR = -9.4). Other diagnoses were documented for 20.0% of patients and 35 (10.1%) patients were assigned this diagnostic category alone, i.e., without any other primary diagnosis. This group included 29 (90.6%) of the sexual violence victims, who received rape-related medical examinations only and were thus assigned to this category more often than other violence groups ($\chi^2(2)$ = 146.50, p < .001; AR = 9.3).

Injuries and other diagnoses were by far the most common diagnostic categories on the identification date. Mental health disorders were diagnosed for 5.2% and unspecified symptoms for 2.3% of the participants. The prevalence of pregnancy complications, genitourinary problems, diseases of the musculoskeletal system and diseases of the circulatory system ranged between 0.3 and 0.9%. Differences in these variables between the violence groups were either non-significant or could not be computed reliably owing to low prevalence rates.

3.2. Diagnostic differences before and after identification

As shown in Table 1, the majority of the participants had used health care services both before and after their identification. On average, the prevalence of preceding diagnoses was significantly higher among victims of family violence than other victim groups ($\chi^2(2)$ = 8.34, p = .015), but after identification the difference between violence groups was no longer significant ($\chi^2(2)$ = 4.52, p = .104). The most prevalent mental and somatic diagnostic categories in the sample are listed in Table 2 while the categories indicating significant differences between the three violence groups are displayed in Table 3 along with relevant chi-square and p-values. Compared to other victim groups, victims of family violence had significantly more genitourinary problems both before and after their identification and more neurological problems before identification. After identification, victims of family violence had significantly more diseases of the respiratory system and genitourinary problems and less substance-related disorders than victims of other violence, but no significant differences existed between victims of family and sexual violence in regard of these variables. The ARs listed in Table 3 indicate some additional cell differences within variables where the overall difference between groups was non-significant. Thus, victims of family violence had potentially more mood disorders before identification and more diseases of the nervous system both before and after identification than other two victim groups.

Table 2
Most prevalent diagnostic categories before and after identification of violence. Research conducted in Finland 2011–2014.

Before identification date		After identification date	
Other diagnoses	66.7%	Other diagnoses	69.0%
Mental health disorders	38.8%	Mental health disorders	51.6%
Neurotic disorders	21.7%	Neurotic disorders	29.3%
Mood disorders	17.7%	Mood disorders	24.6%
Substance-related disorders	15.9%	Substance-related disorders	20.0%
Injuries	32.2%	Injuries	50.7%
Unspecified symptoms	29.9%	Unspecified symptoms	34.5%
Pain	25.2%	Pain	33.3%
Musculoskeletal diseases	21.2%	Musculoskeletal diseases	30.4%
Diseases of the digestive system	16.2%	Diseases of the digestive system	32.2%
Respiratory diseases	15.9%	Respiratory diseases	24.3%
Skin diseases	12.2%	Neurological symptoms	14.5%
Genitourinary diseases	11.6%	Skin diseases	14.2%

3.3. Predictors of family violence

Variables indicating significant differences between the violence groups, and thus included in the multinomial logistic regression model, were mood disorders, neurotic disorders, diseases of the nervous system, genitourinary problems, pregnancy complications, unclassified symptoms, neurological symptoms, other diagnoses, age and gender. While several of these variables were significantly inter-correlated ($p < .05$), the VIFs for all the variable combinations were < 3, indicating that multicollinearity should not present a problem when constructing the logistic regression model (Midi et al., 2010). Variables were added to the model in the presented order. The final logistic regression model displayed in Table 4 was statistically significant ($\chi^2(4) = 198.73$, $p < .001$) but only included age and gender as significant predictors of violence classification. According to the model, victims of family violence were older than victims of sexual ($B = 0.10$, $p < .001$) or other violence ($B = 0.03$, $p = .022$) and 28 times more likely to be women ($B = 3.35$, $p < .001$) than victims of other violence. The model significantly classified 73.0% of all cases and 88.3% of the family violence victims. However, the ROC curves demonstrated that the model only had sufficient sensitivity and specificity when predicting the classification for victims of other violence (AUC = 0.844), but not for victims of family (AUC = 0.264) or sexual violence (AUC = 0.122).

4. Discussion

This retrospective chart review analyzed the health symptoms of family violence victims naturally identified in emergency care and compared them with those of patients experiencing other forms of interpersonal violence. The majority of all the identified patients presented to ED with physical injuries. Injuries were especially common among women experiencing family violence and men experiencing other violence. No other diagnostic differences recorded on the identification date were statistically significant. This supports our first research hypothesis and corresponds with previous research proclaiming that identification of family violence in emergency care is based on external injuries (Davidov et al., 2015; Farchi et al., 2013). However, some demographic differences appeared between the identified violence groups. Victims of family and sexual violence were mostly women and other victims men which resembles previous findings of gender differences (Hamberger and Larsen, 2015; Heiskanen and Ruuskanen, 2010; Yau et al., 2013). Majority of all identified victims were young, which matches data from previous Finnish population-based studies on violence victimization (Heiskanen and Ruuskanen, 2010; Piispa et al., 2006), but in the present sample victims of family violence were also found to be significantly older than victims of sexual and other violence. Older age of the family violence victims is in line with these patients being exposed to violence for an extended time before their identification (Farchi et al., 2013; Leppäkoski et al., 2011). This delay in identification was further supported by the fact that victims of family violence received significantly more diagnoses two years before their recognition than the other victim groups.

Further analysis revealed that the victims of family violence experienced significantly more genitourinary problems, pregnancy complications and neurological symptoms, and possibly more mood disorders and diseases of the nervous system before identification than the other victim groups. Respectively, two years after their identification the victims of family violence experienced significantly more genitourinary problems and potentially more diseases of the nervous system than the other two victim groups. Compared to victims of other violence, victims of family and sexual violence also had significantly more diseases of the respiratory system and complications of pregnancy. Additionally, victims of family and other violence potentially experienced more injuries and less other diagnoses than victims of sexual violence. The fact that victims of family violence presented most varied health symptoms both before and after recognition supports our second

Table 3
Diagnostic differences between violence groups. Research conducted in Finland 2011–2014.

Variable	Before identification date						After identification date					
	Family violence (N = 111)	Sexual violence (N = 32)	Other violence (N = 202)	χ^2	df	p	Family violence (N = 111)	Sexual violence (N = 32)	Other violence (N = 202)	χ^2	df	p
Mental health problems total	39.6%	56.3%$^+$	35.6%	4.98	2	0.083	51.4%	62.5%	50.0%	1.73	2	0.421
Mood disorders	24.3%$^+$	18.8%	13.9%$^-$	5.42	2	0.067	28.8%	28.1%	21.8%	2.15	2	0.342
Substance-related disorders	13.5%	9.4%	18.3%	2.37	2	0.306	**13.5%**$^-$	**6.3%**$^-$	**25.7%**$^+$	**10.86**	**2**	**0.004**
Neurotic disorders	**22.5%**	**46.9%**$^+$	**17.3%**$^-$	**14.24**	**2**	**0.001**	**36.0%**	**40.6%**	**23.8%**$^-$	**7.41**	**2**	**0.025**
Diseases of the respiratory system	18.9%	18.8%	13.9%	1.58	2	0.455	**34.2%**$^+$	**40.6%**$^+$	**16.3%**$^-$	**17.53**	**2**	**< 0.001**
Diseases of the nervous system	12.6%$^+$	3.1%	5.9%	5.50	2	0.064	17.1%$^+$	3.8%	9.4%	4.28	2	0.118
Genitourinary problems	**17.1%**$^+$	**18.8%**	**7.4%**$^-$	**8.33**	**2**	**0.016**	**23.4%**$^+$	**12.5%**	**4.5%**$^-$	**25.76**	**2**	**< 0.001**
Complications of pregnancy	**9.9%**$^+$	**3.1%**	**2.0%**$^-$	**10.37**	**2**	**0.006**	**16.2%**$^+$	**18.8%**$^+$	**1.5%**$^-$	**27.39**	**2**	**< 0.001**
Unclassified symptoms	36.0%	37.5%	25.2%$^-$	4.97	2	0.084	36.0%	31.3%	34.2%	0.28	2	0.871
Injuries	32.4%	18.8%	34.2%	3.01	2	0.222	50.5%	31.3%$^-$	54.0%	5.71	2	0.058
Neurological problems	**9.9%**$^+$	**0.0%**	**4.5%**	**6.07**	**2**	**0.048**	18.9%	9.4%	12.9%	2.86	2	0.239
Other diagnoses	**65.8%**	**90.6%**$^+$	**63.4%**	**9.30**	**2**	**0.010**	70.3%	84.4%$^+$	65.8%	4.56	2	0.102

Note. Significant three-way group differences ($p < .05$; $n \geq 10$) are marked in bold.
$^+$ Adjusted residual ≥ 2.0.
$^-$ Adjusted residual ≤ -2.0.

Table 4
Final multinomial logistic regression model with significant predictors of violence classification. Research conducted in Finland 2011–2014.

	Family violence vs sexual violence				Family violence vs other violence			
Predictors	B	(SE)	OR	[95% CI]	B	(SE)	OR	[95% CI]
Intercept	14.73	(0.79)	–	–	−3.55	(0.54)	–	–
Age	0.10	(0.03)	1.11	[1.05–1.17]	0.03	(0.01)	1.03	[1.00–1.05]
Gender*	–	–	–	–	3.35	(0.37)	28.38	[13.86–58.12]
Model fit	Likelihood ratio				Correctly predicted			
	χ^2	df	*p*	Nag.R^2	All	Family violence	Sexual violence	Other violence
	198.73	4	0.000	0.525	73.0%	88.3%	74.3%	12.5%

Pearson goodness-of-fit: $\chi^2(172) = 164.80$, $p = .640$.
* Comparison group = men. Gender effect could not be computed for family violence vs sexual violence, as all participants in sexual violence group were women.

hypothesis. These findings are in line with the well-established research evidence concerning the detrimental health effects of family violence (Bazargan-Hejazi et al., 2014; Beydoun et al., 2017; Dillon et al., 2013; Ellsberg et al., 2008; Hegarty et al., 2013), although the detected differences between violence groups were not as clear as in previous samples comparing victims of family violence to non-victims. For example, majority of all participants regardless of violence type were diagnosed with further injuries and/or with mental health disorders after their identification. However, clear qualitative differences existed between groups in regard of mental health disorders: victims of family and sexual violence experienced significantly more neurotic disorders after recognition than victims of other violence, who, in turn, were diagnosed with substance-related disorders significantly more often than the two other groups. These findings conform to previous studies associating family and sexual violence with anxiety and post-traumatic stress (Dillon et al., 2013; García-Moreno et al., 2013) and other violence with substance-related disorders (Heiskanen and Ruuskanen, 2010; Vaughn et al., 2010).

The detrimental health effects of family violence are especially worrying given that these patients are rarely identified in health care (Hinsliff-Smith and McGarry, 2017). Another study conducted at the same hospital demonstrated that 7% of all ED patients have experienced recent family violence (Notko et al., 2011), whereas the present sample indicates that only 0.5% of these patients are identified and sufficiently reported at the day-to-day practice of the ED. Although this identification rate is slightly underestimated due to the repetitive visits by the identified victims, both present and previous samples demonstrate that patients experiencing family violence are systemically underidentified in EDs and other medical settings. This seems to be especially true for victims seeking help for other issues than physical injuries. Furthermore, the repeated injuries and prolonged health care problems revealed in the present sample indicate that simply being identified is not automatically helpful for patients experiencing family violence. More effective intervention measures are thus needed in health care services.

Efficient interventions combined with earlier and more comprehensive identification of family violence could significantly lessen the burden that prolonged abuse imposes on both individuals and health services. Since universal screening for family violence has been controversial (Hinsliff-Smith and McGarry, 2017; Leppäkoski et al., 2011), several studies have tried to discover “red flags” for family violence that can be applied in health care settings. The present study provides some support for previously discovered markers, such as repeated injuries and mental health symptoms (Bhargava et al., 2011; Eaton et al., 2016; Reis et al., 2009). However, when the predictive value of gender and age were controlled for, the victims of family violence were no longer significantly distinguished from the other victim groups in any of the diagnostic classes. Our third research hypothesis was thus not supported and no recommendations can be made concerning specific risk markers for screening purposes. Future research might increase our understanding of predictive factors, but the health care services should also acknowledge that universal screening of family violence might be needed due to the prevalence of this problem.

When developing screening policies, it should be taken into account that distinguishing victims of family violence from other victims of interpersonal violence is more difficult than separating them from non-victims. For example, many health outcomes commonly associated with family violence, such as pain, sleep problems and undefined health symptoms, did not significantly differentiate the studied victim groups from one another. Additionally, the detected health differences were clearer before than after identification. In the case of mood disorders and neurological symptoms this change can be attributed to the tendency for the victims of sexual and other violence to reach the previously higher level of the family violence victims, whereas for neurotic disorders the prevalence rates among the family violence patients reached the level of the sexual violence patients. These patterns are interesting and highlight the need for more longitudinal research on the health effects of interpersonal violence. It is also likely that different victim groups require specific treatment after identification, and thus in both research and practice more attention should be paid to the differences between victims of family violence, other violence and sexual violence.

However, it is also important to notice that victims of family and sexual violence presented more similar health symptoms than victims of other violence. The similarity of the health effects associated with family and sexual violence has been supported by previous research, as well (García-Moreno et al., 2013). Interpersonal violence is a highly gendered issue with women being mostly exposed to family and sexual violence perpetrated by men, and men to non-familiar violence by other men (Heiskanen and Ruuskanen, 2010). In the present sample, the victims of family and sexual violence were diagnosed with significantly more physical and mental health issues than victims of other violence, which emphasizes the harmfulness of these forms of violence typically experienced by women. These findings highlight that interpersonal violence is not only a personal issue, but instead a sociopolitical problem that requires more decisive interventions and preventive actions throughout the society, including in health care settings.

While the present study provides valuable new insights on the topic, its limitations should be taken into account. First, the generalizability of the results is questionable due to the low rate of identification of family violence victims in the studied ED. Moreover, no reliable information on possible polyvictimization in the sample is available. Due to the high prevalence of family violence in Finland, it is likely that several participants in the other violence and sexual violence groups had also experienced family violence at some point during their lives. This could hide health differences between the violence groups. Furthermore, it is unclear to what extent the differences found in crosstabs between the patients experiencing family, sexual and other violence can be

attributed to gender rather than the type of violence. It is known that women use health care services more frequently than men (Kapiainen and Eskelinen, 2014; Merrill and Fowers, 2019) and also more often seek help after experiencing violent crime (Youstin and Siddique, 2018). On the other hand, it has been argued that the higher frequency of domestic and sexual abuse experienced by women might at least partly explain their higher use of health care (Dunn et al., 2012). Another limitation of the sample is that no other sociodemographic factors other than gender and age were available for analysis. For these reasons, more studies are needed before robust conclusions can be drawn on the health differences between victims of different forms of interpersonal violence.

5. Conclusion

The present findings demonstrate that family violence is a prevalent problem among patients presenting to emergency care and that its effects on victims' health are at least as significant as those of other forms of interpersonal violence. However, family violence is seriously underidentified in emergency care, with the result that victims are likely to suffer from a wide range of mental and somatic health issues and to make repeat visits to EDs and other medical services. When advocating the need of family violence identification in EDs, it should be borne in mind that differentiating victims from non-victims of family violence is likely to be easier than differentiating between victims of family violence and victims of other types of violence. On the other hand, distinguishing between family, sexual and other violence could facilitate the provision of more suitable and effective treatment for these patient groups in health care settings.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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III

HEALTH CARE USE AND COSTS RESULTING FROM INTERPERSONAL VIOLENCE: A RETROSPECTIVE CHART REVIEW

by

Heli Siltala, Anneli Kuusinen-Laukkala & Juha Holma, December 2020

Submitted manuscript

Introduction

The World Health Organization (WHO) defines interpersonal violence as the use of physical force or other power that causes or is likely to cause harm to another person (Krug et al., 2002). Murder, sexual violence and physical assaults are estimated to be the costliest crimes, with per-offense costs to society of $9 million, $241,000 and $107,000, respectively (McCollister, French, & Fang, 2010). Altogether, the costs of interpersonal violence amount to as much as 2-6% of annual GDP in industrialized countries and even more in low-income countries (Waters et al., 2004). The severe risks to both physical and mental health posed by interpersonal violence (Friborg et al., 2015; Tan & Haining, 2016) mean that a significant part of the costs of violence are borne by the health care sector (Dubourg et al.,2005; Heiskanen & Piispa, 2002). Since this is especially likely for family and sexual violence, the WHO (2016) has recommended that health care services play a more significant role in preventing these forms of violence. The prevalence of family violence in Finland, the context of this study, has been reported to be among the highest in Europe, with 5% of women reporting recent and 30% lifetime physical or sexual abuse by a current or previous partner (FRA, 2014). Research also suggests that interventions targeted at family violence are on average more cost effective than those targeting sexual violence or other types of physical assault (Waters et al., 2004). Thus, reducing violence, and especially family violence, through interventions could greatly benefit societies in several ways. As a first step, this study sought to clarify the health care use and costs of victims of different forms of interpersonal violence.

Victims of family violence visit health care services more often than non-victims (Dichter et al., 2018; Hegarty et al., 2013; Kothari et al., 2014). It has been estimated that the health care costs of victims of family violence are 20-36% higher than those of the general population (Dolezal et al., 2009; Kruse et al., 2011; Rivara et al., 2007). Significantly higher estimates of double this amount have also been reported (Ulrich et al., 2003). The increase in violence-related costs has been found to persist for several years (Fishman et al., 2010; Rivara et al., 2007). As a result, the annual costs of emergency care alone for victims of family violence in the US have been estimated to be $89 million (Davidov et al., 2015) while estimates of annual total medical costs in the US have ranged from $2 billion to $7 billion (Brown et al., 2008). In Finland, the total health care costs resulting from family violence have been estimated to be €23 million (Heiskanen & Piispa, 2002), or around 0.01% of Finland's GDP, and thus in line with the lower estimates of Brown et al. (2008). While family violence is clearly a costly problem, the scarcity of studies and the wide variation in estimates of health care costs call for more research on the topic. It should also be noted that cost estimates are usually based on known cases of family violence, which form only a minority of all such incidents (Hinsliff-Smith & McGarry, 2017).

Although interpersonal violence is known to be associated with impaired health, only a few studies have compared the effects on victims' health or the health care costs of different types of violence. Both family and sexual violence have been associated with serious mental illnesses, such as depression, anxiety, and PTSD (Dillon et al.,

2013; Dworkin, 2018; Siltala et al., 2020), and found to cause more psychological distress than other types of interpersonal violence (Youstin & Siddique, 2019), most of which have been associated with substance abuse (Siltala et al., 2020; Vaughn et al., 2010). Family and sexual violence are also interlinked, as in most instances the perpetrator of sexual violence is a current or previous partner (FRA, 2014). In addition to mental health problems, family violence has been shown to increase the likelihood of other long-term health impairments, including functional and self-reported health, pain, sleep problems, and coronary disease (Dillon et al., 2013; Hegarty et al., 2013; Kothari et al., 2014; Wright et al., 2019).

The few existing comparative studies have reported higher per case costs for sexual than for family violence (Waters et al., 2004) or other non-lethal physical assaults (Dubourg et al., 2005; McCollister et al., 2010; Wickramasekera et al., 2015). However, it is possible that the various health-impairments associated with family violence combined with its high prevalence rates result in higher total health care costs for family violence than other forms of interpersonal violence. Recurrent victimization is also typical in family violence (Farchi et al., 2013; Heiskanen & Ruuskanen, 2010; Hoelle et al., 2015; Kothari et al., 2014; Leppäkoski et al., 2011), which further increases the likelihood of victims developing adverse health effects (Dillon et al., 2013; Friborg et al., 2015). Further detrimental health outcomes also follow from the psychological abuse associated with family violence (Friborg et al., 2015; Lagdon et al., 2014; Siltala et al., 2019). However, cost comparisons between family violence and other types of violence are hampered by the high disparity between research methodologies (Wickramasekera et al., 2015; Waters et al., 2004). To our knowledge, no direct comparisons of the costs of all three types of violence in the same study have been reported. More research on the subject is thus called for.

Although direct physical injuries account for only a minority of all the costs associated with interpersonal violence (Hoelle et al., 2015; McCollister et al., 2010; Wickramasekera et al., 2015), emergency care plays a significant role in identifying and caring for the victims of interpersonal violence. Data on help-seeking victims have shown that women are more likely to have experienced family violence and been assaulted at home whereas men have more likely experienced other forms of violence, been assaulted outside the home, and been under the influence of alcohol at the time of the assault (Nurmi-Lüthje et al., 2008; Tingne et al., 2014; Yau et al., 2013). Women have also been more likely to be sexually assaulted (Nurmi-Lüthje et al., 2008; Seifert et al., 2009; Yau et al., 2013). Systematic screening studies have established that 1-8% of all ED visits are directly caused by family violence (Boyle & Todd, 2003; Kothari et al., 2014; Notko et al., 2011; Parekh et al., 2012; Sethi et al., 2004; Sprague et al., 2014). Moreover, 11-40% of patients have also previously experienced family violence (Bazargan-Hejazi et al., 2014; Hegarty et al., 2013; Notko et al., 2011; Sprague et al., 2014). However, studies based on medical records report much lower prevalence rates (Davidov et al., 2015; Farchi et al., 2013; Kivelä et al., 2019; Siltala et al., 2020), indicating that only a fraction of domestic violence victims are properly identified and recorded. This implies a clear need for improving screening practices in emergency care and other health care services.

Individuals identified as victims of family violence have typically experienced serious violence (Hegarty et al., 2013; Leppäkoski et al., 2011; Santas et al., 2020) and

frequently revisit EDs after identification (Dichter et al., 2018; Hoelle et al., 2015; Rivara et al., 2007). While some research indicates that health care visits related to domestic violence before and after identification are not evenly distributed, findings overall have been inconsistent. Hoelle et al. (2015) reported that visits to health care services by victims of family violence increased before their identification and declined thereafter. Other studies have found an increase during the first year after the incident (Logan et al. 2012) and a decline during the next two to four years (Kruse et al., 2011). In turn, Kothari et al. (2014) reported a significant increase in injury-related health care visits from before to after the occurrence of family violence among men but not women. Fishman et al. (2010) reported that the elevated health care costs associated with family violence had returned to the baseline level after three years, whereas Rivara (2007) reported 20% higher health care costs up to five years later.

The scarcity of research and the inconsistent findings of the existing studies call for more research on health care use related to family violence. Further research on the trends in health care use of victims of other forms of interpersonal violence, where even less information exists, is also needed. A cross-sectional study by Helweg-Larsen et al. (2011) concluded that the health care costs of women exposed to other forms of interpersonal violence were higher after the incident than those of women exposed to family violence, whereas for men the situation was the reverse. In their analysis of family violence court cases (victim/defendant), Kothari et al. (2014) reported that men accumulated more injury-related hospital visits than women irrespective of their role in the incident. To our knowledge, the trends in health care use of the victims of different types of interpersonal violence have not previously been compared longitudinally. If health care visits related to family or other forms of interpersonal violence were found to escalate over time, this knowledge might enable the earlier identification of victims. Research has shown that interventions targeted to vulnerable patients are helpful and significantly decrease their vulnerability to crime/family violence (Christ et al, 2018; Iverson et al., 2011).

Research questions

The present research goal contributes to filling the gap in the literature by comparing the health care use and costs of victims of different types of interpersonal violence in Finland. The research hypotheses, based on the research evidence presented in the introduction, were as follows:

H1) Compared to victims of sexual or other interpersonal violence, victims of family violence visit health care services more frequently both before and after their identification, and thus generate higher total health care costs.

H2) Health care visits increase before identification and decline afterwards among victims of family violence but not among victims of sexual or other interpersonal violence.

Method

Sample

The study was implemented in a middle-sized Finnish central hospital in 2011-2014. The sample for this retrospective chart review included all the hospital's ED patients who, during this period, who had been assigned an ICD-10 diagnosis code indicating trauma caused by interpersonal violence. The initial sample comprised 518 patients; however, after removing falsely identified accident victims (n = 120), patients whose medical records were unavailable due to residence in other municipality (n = 22) and children under 16 years of age (n = 31), the final sample for analysis was 345. The sample comprised 0.1 % of the total of 340,308 ED visits recorded at the hospital during the study period. Details of the final sample are summarized in Table 1. The sample contained slightly more women than men. The victims of family and sexual violence were predominantly women and majority of the other victims men. Participants were 16-86 years old, with a mean age of 32.0 years. The descriptive results have been reported elsewhere (Siltala ym., 2020). The results indicated that the gender differences between groups were statistically significant and that the victims of sexual violence were significantly younger than those of family or other violence.

Variables

The type of violence recorded at the identification date was extracted from medical records. A participant was labeled as having experienced family violence if the perpetrator was reported to be a spouse, ex-spouse, dating partner, child, parent, or other family member. Two family violence patients reported experiencing sexual violence and one psychological violence. The others reported experiencing physical violence. Participants seeking help due to a sexual assault by an unknown perpetrator were assigned to the sexual violence group. The remaining participants reporting physical assault by a non-family perpetrator were labeled as having experienced other forms of interpersonal violence.

Participants' health care use was estimated by retrieving all available health care contacts and visits from their medical records 24 months before and after the identification date. Medical records searched were those maintained by all public service providers, i.e., primary health care, specialist health care (including psychiatric care), nursing homes, dental care, and school health care, in the study area over the period 2009-2016. Visits to private health care providers and visits made in other municipalities were unavailable for the data retrieval. Since a single visit to a health care services provider might have been recorded separately by different "contacts", such as a physician and laboratory testing personnel, only one visit per day per participant was counted for the purpose of this study. However, health care costs were calculated by including all recorded contacts in the analysis.

Health care costs were estimated based on the rates provided by the health care district. If the exact rates for each procedure or visit were not available, a mean estimate of the costs of each service provider and visit type was used instead. Exact rates were available for 94.1% of visits. Total health care costs were calculated for each individual before and after identification. Costs accumulated on the date of

identification were included in the "after" category. In order to compare the development of visits and costs between the different violence groups, total visits and costs for each group were calculated for each week preceding and following the identification date. The numbers of visits and costs were standardized by dividing the weekly sum by the number of participants in each group.

Statistical analysis

The data regarding the service use of the identified victims contained several significant outliers. Additionally, the Saphiro-Wilk test showed that the health care visits were not normally distributed neither before ($p < .001$ for all violence groups) nor after identification ($p < .010$ for all violence groups). Instead, the health care visits were strongly skewed towards the lower end of health care visits both before and after identification. Thus, the between-group differences in total health care use and costs were analyzed with the non-parametric Kruskall-Wallis H test. Significance values for post-hoc comparisons were adjusted by Bonferroni correction for multiple tests. Trends in service use of the three identified victim groups were analyzed in more detail by examining the correlations of the number of health car visits and costs with time from the identification date. As the initial data showed that the total number of health care visits was 2.5-4.5 times higher during the first week after identification than during any other week in all violence groups, the first week after identification was excluded from the final correlation analyses. Figure 1 illustrates the difference within the group of family violence victims. All analyses were performed using IBM SPSS Statistics 25 software.

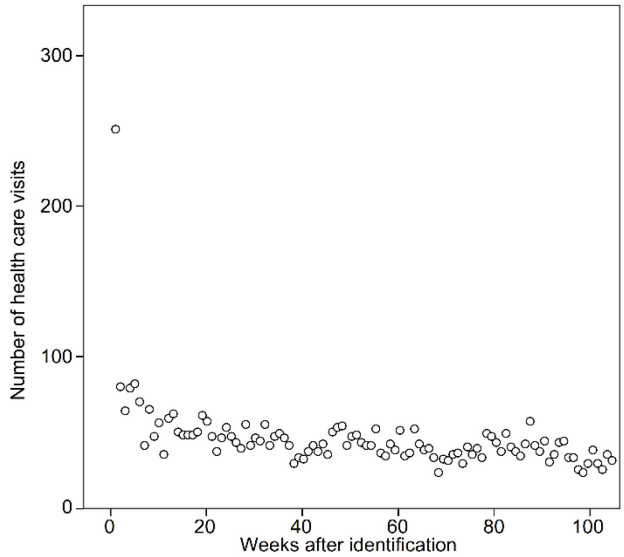

FIGURE 1 The unstandardized weekly health care visits of family violence victims, including the week of identification

TABLE 1 Sample descriptives

Variable	All (N = 345)	Family violence (n = 111)	Sexual violence (n = 32)	Other violence (n = 202)
Gender				
Women	53.3%	90.1%	100%	25.7%
Men	46.7%	9.9%	0%	74.3%
Age group				
16-17	4.3%	1.8%	18.8%	3.5%
18-30	52.8%	43.2%	71.9%	55.0%
31-50	29.6%	36.9%	6.3%	29.2%
51 ≤	13.3%	18.0%	3.1%	12.4%
Visits before M (SD)	22.49 (28.28)	27.41 (31.21)	21.66 (26.78)	19.92 (26.55)
Visits after M (SD)	34.07 (43.96)	38.32 (35.86)	33.56 (26.06)	31.82 (49.84)
Costs before (euro) M (SD)	3,745.94 (5177,62)	4,369.76 (4983.36)	2,866.97 (3412.54)	3,542.40 (5487.58)
Costs after (euro) M (SD)	5,720,33 (7395.99)	6,077.28 (6537.51)	5,832.15 (4652.20)	5,506.47 (8171.38)

Note. The means (M) and standard deviations (SD) for health care visits and costs are presented for two years before and after identification

Results

Health care use

Altogether, the participants made 19 292 health care visits and contacts, 40.2% during the 24 months before and 59.8% during the same period after identification. The number of health care visits varied between 0-168 visits or contacts before and 0-370 after identification. No recorded visits or contacts were recoded for 10.7% of the participants before identification and 3.7% afterwards. Means and standard deviations for health care visits and costs across the sample are summarized in table 1.

The Kruskall-Wallis tests indicated a significant difference between the violence groups in the number of health care visits both 24 months before identification ($\chi^2(2) = 8.91$, $p = .012$) and 24 months after identification ($\chi^2(2) = 11.26$, $p = .004$). Mean ranks before and after identification were 194.66 vs. 193.61 for family violence, 180.45 vs. 197.05 for sexual violence and 159.92 vs 157.87 for other violence. Post-hoc analyses showed that the victims of family violence had significantly more health care visits than the victims of other violence both before ($p = .010$) and after identification ($p = .007$). The sexual violence group did not differ significantly from the other two groups in their health care use.

Participants' health care use was not evenly distributed during the weeks preceding or following the identification date. All three victim groups showed a significant increase in health care visits towards their identification dates. Linear correlations were strong: $r = .72$ ($p < .001$) for family violence, $r = .50$ ($p < .001$) for sexual violence, and $r = .74$ ($p < .001$) for other violence. After identification, the victims of family and sexual violence showed a significant decrease in their health care visits, with linear correlations of $r = -.64$ ($p < .001$) for family and $r = -.61$ ($p < .001$) for sexual violence. The victims in the other violence group did not show a significant decrease in health care visits after identification ($r = .01$, $p = .925$). Changes in weekly health care visits by violence group are presented in figures 2-4.

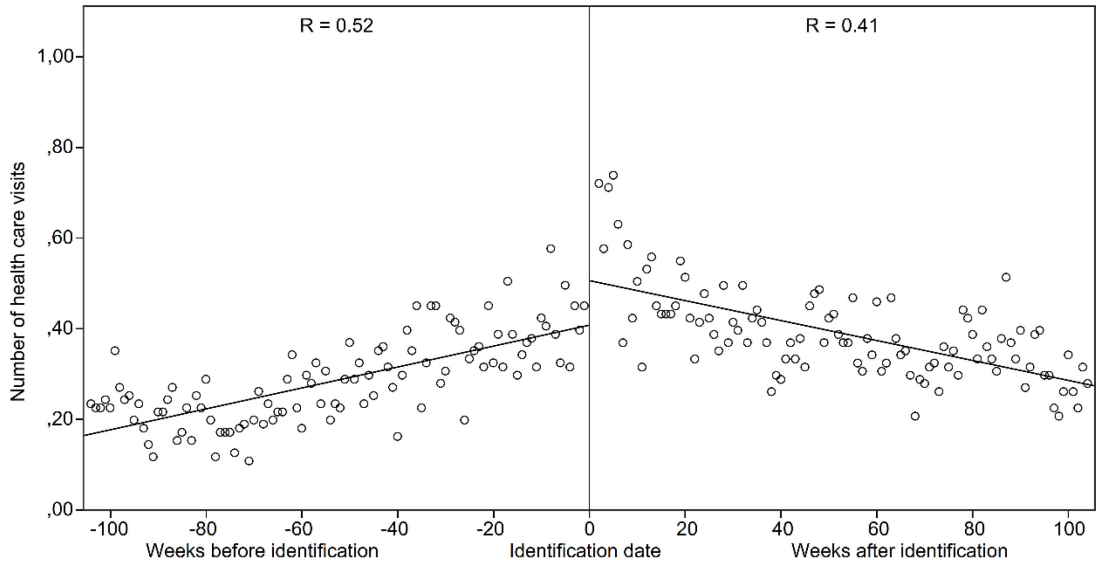

FIGURE 2 Correlation between standardized number of health care visits and time from identification date for victims of family violence

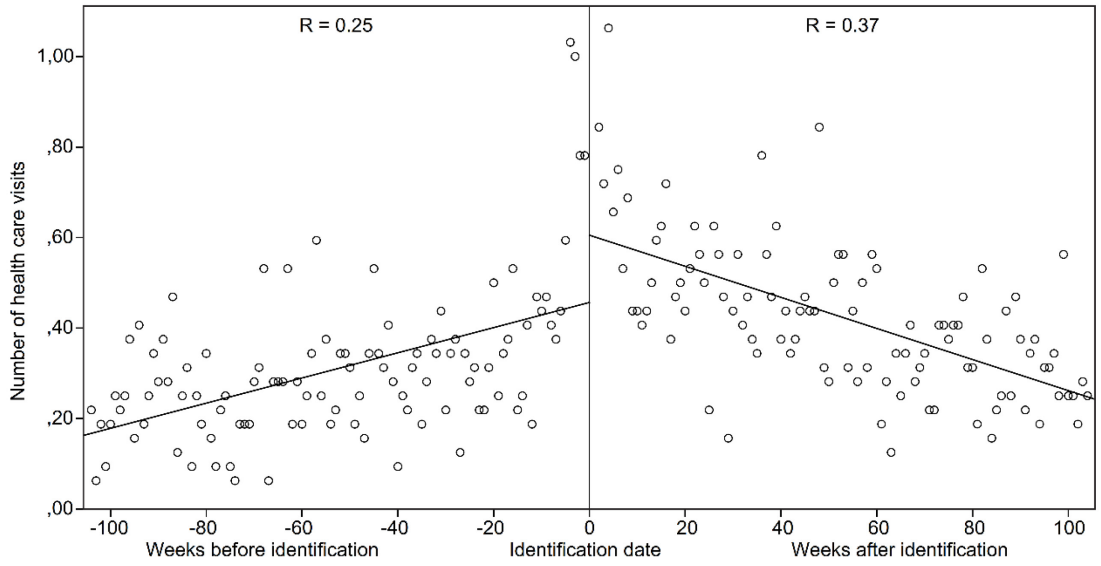

FIGURE 3 Correlation between standardized number of health care visits and time from identification date for victims of sexual violence

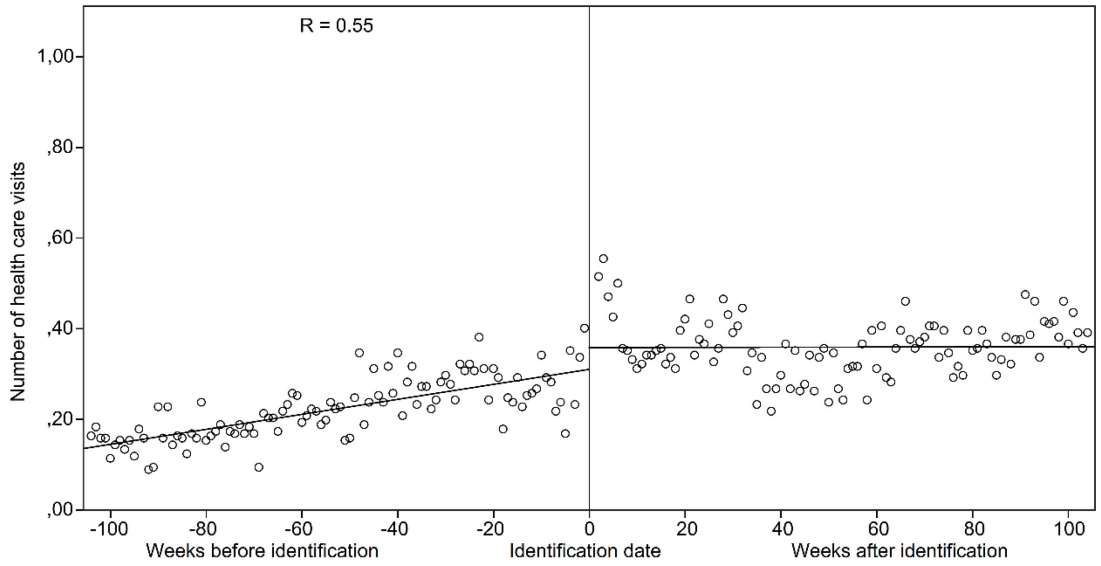

FIGURE 4 Correlation between standardized number of health care visits and time from identification date for victims of other violence

Health care costs

The total costs of the recorded health care visits were €1.29 million before and €1.97 million after identification. Mean annual health care costs per person in the studied region in 2011-2014 were €1,654. Based on the total costs displayed in table 1, the mean annual costs generated by victims of family violence thus exceeded those of the general population by 32.1% two years before and by 83.8% two years after identification. In turn, the corresponding costs of the victims of other violence were 7.1% and 66.5% higher and those of the victims of sexual violence 13.3% lower and 76.4% higher than in the general population.

Mean costs differed between the three violence groups both before ($\chi^2(2) = 6.98$, $p = .031$) and after identification ($\chi^2(2) = 8.28$, $p = .016$). Mean ranks two years before identification were 193.36 for family violence, 169.69 for sexual violence and 162.34 for other violence. Mean ranks two years after identification were 186.65 for family violence, 203.91 for sexual violence and 160.60 for other violence. Before identification, health care costs were significantly higher among the victims of family than other violence ($p = .025$). The victims of sexual violence did not differ from the two other victim groups in their health care costs before identification. Two years after identification, no statistically significant differences were observed between the three groups.

Changes in the weekly health care costs for each violence group are presented in figures 4-6. The figures include the mean health care costs in the study region as reference (red line). As with health care visits, health care costs escalated towards the identification date in all victim groups. This linear correlation was strong in all groups: family $r = .60$ ($p < .001$), sexual $r = .52$ ($p < .001$) and other violence $r = .57$ ($p < .001$). The health care costs of the family violence victims surpassed the population mean approximately 1.5 years before their identification date, which was earlier than that in

the other two groups. After identification, health care costs decreased significantly in all groups. This linear correlation was strong for family (r = -.56, p < .001) and sexual violence (r = -.52, p < .001) and low for other violence (r = -.23, p = .018). Despite declining over time, the health care costs of the family violence victims did not quite fall to the mean level of the general population during the two-year follow-up. The costs of the victims of sexual violence returned to the population mean within two years of their identification. The costs of the victims of other violence remained relatively stable in comparison to the population mean during the two-year follow-up.

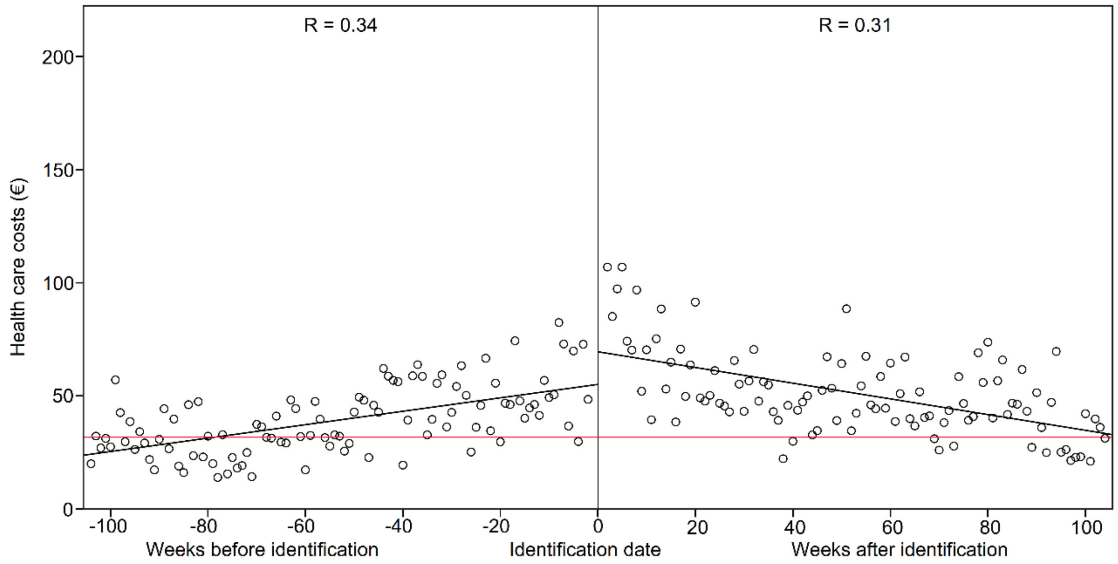

FIGURE 5 Correlation between standardized health care costs and time from date of identification for victims of family violence, compared to population mean

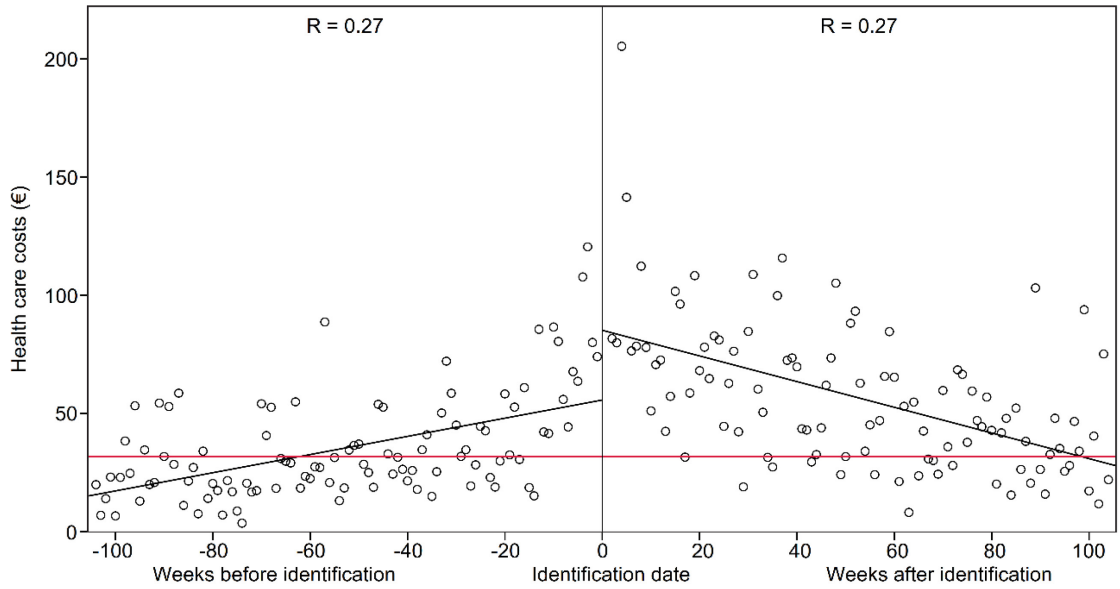

FIGURE 6 Correlation between standardized health care costs and time from date of identification for victims of sexual violence, compared to population mean

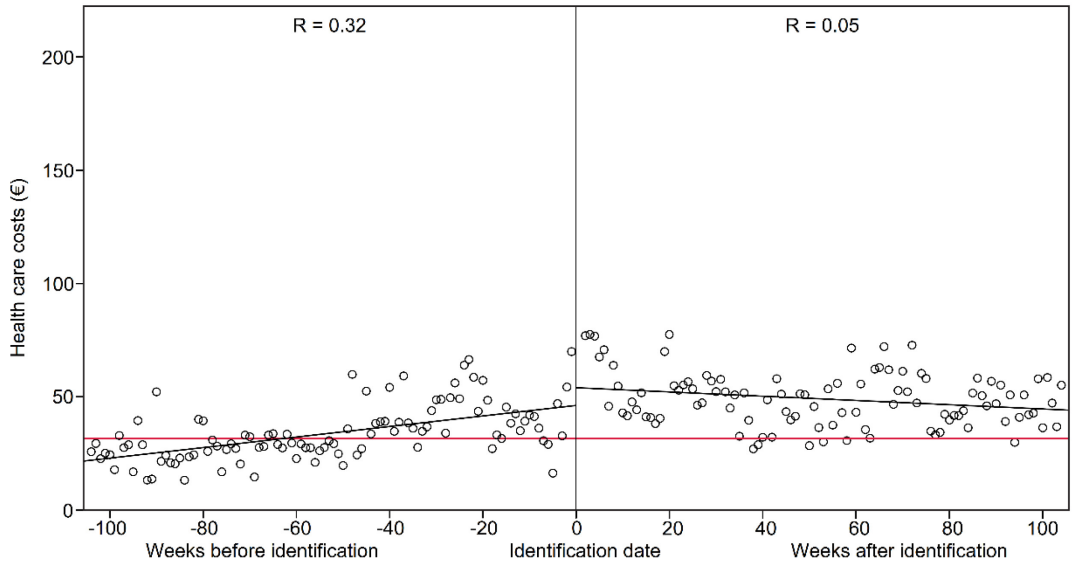

FIGURE 7 Correlation between standardized health care costs and time from date of identification date for victims of other violence, compared to population mean

Discussion

Main findings

Although studies comparing victims of family violence to non-victims have established the extent of the health-related problems associated with family violence (Dillon et al., 2013), the present study is, to our best knowledge, the first to directly compare the health care use of victims of different forms of interpersonal violence using empirical longitudinal data. The data analysis extended over a four-year period for each participant. The first research hypothesis was that health care use and costs would be higher among the victims of family violence than in the other victim groups. The results showed that patients experiencing family violence made significantly more health care visits both before and after identification and generated higher health care costs before identification than patients in the group labeled "other violence", i.e., physical violence by non-familial perpetrators. The victims of sexual violence did not significantly differ those of the family or other violence groups in their health care use or costs. The first research hypothesis was thus partially supported. These results conflict somewhat with previous reports of higher health care costs for victims of sexual than other forms of interpersonal violence (Dubourg et al., 2005; McCollister et al., 2010; Wickramasekera et al., 2015; Waters et al., 2004).

The second research hypothesis was based on previous findings on the use of health care services by victims of family violence (Fishman et al., 2010; Hoelle et al., 2015; Kruse et al., 2011). The number of health care visits and the costs of treating victims of family violence were expected to increase during the time leading up to their identification and to decline thereafter. While this assumption was supported by the data, a similar increasing trend in health care use and costs was also observed in

other two victim groups. After identification, however, health care use and costs declined strongly in the family and sexual violence groups, whereas in the other violence group health care costs showed a slight decline and health care use continued on the same level. Trends in the health care use of victims of sexual or other violence have not previously been analyzed. These new findings are in line with previously detected similarities in the health-related effects of family and sexual violence (Dillon et al., 2013; Dworkin, 2018; Siltala et al., 2020) and partially supported the second research hypothesis.

Mean annual health care costs for the victims of family violence in the present sample were €2,185 before and €3,039 after identification whereas the respective costs for sexual violence were €1,434 and €2,916 and for other violence €1,771 and €2,753. Compared to the general population, the victims of family violence generated on average 30% higher health care costs before their identification and almost twofold higher costs thereafter. These finding are in line with previous higher-end estimates of the costs of family violence (Dolezal et al., 2009; Kruse et al., 2011; Rivara et al., 2007; Ulrich et al., 2003). Comparing these costs with those of non-familial forms of violence is considerably more difficult, since most previous studies on the subject have only measured health care costs occasioned immediately after identification of the violent incident (Dubourg et al., 2005; McCollister et al., 2010; Wickramasekera et al., 2015; Waters et al., 2004). The only previous study conducted on the subject in Finland estimated mean annual health care costs of family violence to be €2,311 per identified case (at 2019 values) (Heiskanen & Piispa, 2002). In the UK, Dubourg et al. (2005) estimated mean annual health care costs to be £1,459 (€1,578) for sexual violence and £196 (€212) for common assault (at 2019 values).

The present Finnish sample thus showed significantly higher costs for all three types of violence. One reason for these higher costs might be that the present data were based on verifiable health care visits by victims of violence, whereas previous studies have either reported probability-weighted cost estimates (Dubourg et al., 2005) or based their estimates on allocated work time reported by health care professionals directly after the violent incident (Heiskanen & Piispa, 2002). The present sample measured not only health care use and costs directly attributable to violence, such as treatment of injuries, but also total health care use, which we regard as a more comprehensive measure of the various health effects resulting from violence. Obviously, the higher reported costs might also, at least partially, be affected by cultural or other contextual factors.

The trend in health care use of the victims of family violence followed a pattern resembling that reported by Hoelle et al. (2015). Our findings are also in line with previous observations of elevated health care costs continuing for several years after abuse (Fishman et al., 2010; Rivara et al., 2007). They also reflect the fact that the health effects of family violence are not restricted to acute injuries (Dillon et al., 2013; Kothari et al., 2014). The trend towards increased health care use before identification might indicate cumulative exposure to abuse, as many victims of family violence have reported that their decision to disclose the source of their injuries in emergency care was triggered by the escalating nature of the violence and their fear of being hurt again or killed (Catallo et al., 2012). The same trend among the victims of non-familial interpersonal violence has not previously been analyzed. However, the similarities

between the victims of family and sexual violence detected in the present sample are in line with the associations of these forms of violence with impaired mental health reported earlier (Dillon et al., 2013; Dworkin, 2018; Siltala et al., 2020), indicating that family and sexual violence are potentially psychologically more detrimental than other forms of interpersonal violence. As in previous samples (Yau et al., 2013), almost all the victims of family and sexual violence were found to be women. Accordingly, it has been reported that men with substance abuse issues are likely to be both perpetrators and victims of violence, whereas women with anxiety and depression are likely to be victims only (Roaldset & Bjørkly, 2015). Female gender, mental health issues and experiences of family and sexual violence seem to be interlinked, indicating that healthcare services should pay greater attention to identifying these vulnerable patient groups.

Implications

Since the present study is the first to directly compare the health care use and costs of different forms of interpersonal violence using a longitudinal approach, more research on the topic is clearly needed. Nevertheless, the present sample demonstrates that merely being identified as a victim of family violence in emergency care can significantly decrease these victims' health care use and costs, although precisely how the violence was discussed with patients was not within the remit of this study. In 2009-2010, the present hospital had participated in an EU-funded research and developmental project aimed at improving family violence interventions in health care settings. However, a follow-up study demonstrated that the implementation of the practices developed had not been long-lasting (Husso et al., 2020). Thus, it is unlikely that the identified patients had received any special intervention for family violence.

While routine screening for family violence continues to be a controversial issue, it has been supported by some studies (Hinsliff-Smith & McGarry, 2017). Since health care use and costs were highest among the victims of family and sexual violence, earlier and more comprehensive identification of these at-risk patients might be especially effective in decreasing the total health care costs resulting from interpersonal violence. The low number of identified patients in the current sample and the high level of service use before identification demonstrate that many opportunities for interventions are being missed in health care services.

Identification in ED's could be especially important as victims of family violence seeking help from emergency care have often been subjected to serious violence (Hegarty et al., 2013; Leppäkoski et al., 2011; Santas et al., 2020) and are at high risk for further victimization (Brignone & Gomez, 2017). However, identification should not be based solely on injuries, as the victims of family violence regularly seek help for other health symptoms, such as infections, obstetrical and gynecological issues, back and stomach problems, chronic pain, mental health issues, and substance abuse (Farchi et al., 2013; Hoelle et al., 2015). Additionally, a high prevalence of patients experiencing family violence has also been noted in other units, such as psychiatric care and maternity (Notko et al., 2011; Alhabib et al., 2010). Thus, more comprehensive

screening and intervention procedures for family violence need to be implemented across health care services to more effectively treat the associated health problems.

Limitations

The limitations of this study should be taken into account when interpreting the results. First, the small sample identified in just one hospital limits generalization of the results. The sexual violence group was especially small and showed wide variation in health care use; these factors can be assumed to have influenced the statistical analyses. In addition, the results reflect the Finnish context and may not be directly replicable in other cultural contexts. Moreover, apart from age and gender no demographic information on the participants was available. However, as a part of the Finnish universal public health system, the studied hospital provides care for a diverse patient population, varying in socioeconomic status, ethnicity, language, nationality, gender identity, sexual orientation, religion, and functional ability. The study design did not include a comparison group of non-victims, which would be needed to consider the effect of gender and other sociodemographic factors in the sample.

It is also important to note that the sample only included victims who were identified and recorded during the ED's regular mode of operation. Since the majority of victims of interpersonal violence do not seek help or disclose their abuse to health care professionals (Heiskanen & Ruuskanen, 2010; Hinsliff-Smith & McGarry, 2017), it is possible that non-identified victims might differ significantly in their health care use compared to the present sample. There is also likely to be some overlap between the identified victim groups. For example, due to the high prevalence of family violence among Finnish women (FRA, 2014), some of the women identified as victims of non-familial violence are also likely to have experienced family violence at least once in their lives. Thus, differences between the violence groups might be clearer in samples adjusted for multiple victimization. Similarly, no direct information was available on re-victimization. This is an important topic for future studies since repetitive exposure to violence has been found to increase the likelihood of adverse health effects. Despite these shortcomings, this is the first study to explore possible differences in health care use and costs across different types of interpersonal violence, and the results provide an interesting starting point for future research on the subject.

Conclusion

Health care use and costs are known to be significantly higher among victims of family violence than in the general population (Dichter et al., 2018; Hegarty et al., 2013; Kruse et al., 2011). The present study demonstrated that while the health care use and costs of victims of family and sexual violence were also higher than those of victims of physical violence by non-familial perpetrators, they also declined significantly after recognition in the first two groups and remained stable in the last-mentioned group. The findings on the long-term cumulative health effects of family violence are in line with those of previous studies (Dillon et al., 2013; Friborg et al., 2015; Hoelle et al.,

2015). It is noteworthy that simply being identified in emergency care seemed to be a significant turning point for the present sample of family violence victims and that their subsequent use of health care services declined. Earlier identification of victims of family violence could thus significantly decrease the cumulative adverse health effects resulting from violence and create notable savings in the health care sector. However, more research is needed on how gender, mental health issues, and experiences of violence are interlinked.

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