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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 (Cougale 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) ≥ 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 $AR \geq 2.0/\leq -2.0$ 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 Kruskal-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 ($AUC = 0.122$).

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 .

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 4

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

Predictors	Family violence vs sexual violence				Family violence vs other violence			
	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 under-identified 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-familial 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 under-identified 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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References

Bazargan-Hejazi, S., Kim, E., Lin, J., Ahmadi, A., Khamesi, M.T., Teruya, S., 2014. Risk factors associated with different types of intimate partner violence (IPV): an emergency department study. *J. Emerg. Med.* 47 (6), 710–720. <https://doi.org/10.1016/j.jemermed.2014.07.036>.

Beydoun, H.A., Williams, M., Beydoun, M.A., Eid, S.M., Zonderman, A.B., 2017. Relationship of physical intimate partner violence with mental health diagnoses in the nationwide emergency department sample. *J. Women's Health* 26 (2), 141–151. <https://doi.org/10.1089/jwh.2016.5840>.

Bhargava, R., Temkin, T.L., Fireman, B.H., Eaton, A., McCaw, B.R., Kotz, K.J., Amaral, D., 2011. A predictive model to help identify intimate partner violence based on diagnosis and phone calls. *Am. J. Prev. Med.* 41 (2), 129–135. <https://doi.org/10.1016/j.amepre.2011.04.005>.

Cogle, J.R., Resnick, H., Kilpatrick, D.G., 2009. Does prior exposure to interpersonal violence increase risk of PTSD following subsequent exposure? *Behav. Res. Ther.* 47 (12), 1012–1017. <https://doi.org/10.1016/j.brat.2009.07.014>.

Davidov, D.M., Larrabee, H., Davis, S.M., 2015. United States emergency department visits coded for intimate partner violence. *J. Emerg. Med.* 48 (1), 94–100. <https://doi.org/10.1016/j.jemermed.2014.07.053>.

Dichter, M.E., Sorrentino, A.E., Haywood, T.N., Bellamy, S.L., Medvedeva, E., Roberts, C.B., Iverson, K.M., 2018. Women's healthcare utilization following routine screening for past-year intimate partner violence in the Veterans Health Administration. *J. Gen. Intern. Med.* 33 (6), 936–941. <https://doi.org/10.1007/s11606-018-4321-1>.

Dillon, G., Hussain, R., Loxton, D., Rahman, S., 2013. Mental and physical health and intimate partner violence against women: a review of the literature. *Int. J. Fam. Med.* 2013 (2013), 313909–313914. <https://doi.org/10.1155/2013/313909>.

Dunn, E.C., Gilman, S.E., Willett, J.B., Slopen, N.B., Molnar, B.E., 2012. The impact of exposure to interpersonal violence on gender differences in adolescent-onset major depression: results from the National Comorbidity Survey Replication (NCS-R). *Depress Anxiety* 29 (5), 392–399. <https://doi.org/10.1002/da.21916>.

Eaton, A., Temkin, T.L., Fireman, B.H., McCaw, B.R., Kotz, K.J., Amaral, D., Bhargava, R., 2016. A description of midlife women experiencing intimate partner violence using electronic medical record information. *J. Women's Health* 25 (5), 498–504. <https://doi.org/10.1089/jwh.2015.5205>.

Farchi, S., Polo, A., Asole, S., Ruggieri, M.P., Di Lallo, D., 2013. Use of emergency department services by women victims of violence in Lazio region, Italy. *BMC Women's Health* 13 (1), 31. <https://doi.org/10.1186/1472-6874-13-31>.

García-Moreno, C., Pallitto, C., Devries, K., Stöckl, H., Watts, C., Abrahams, N., 2013. Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence. Geneva: World Health Organization. <https://www.who.int/reproductivehealth/publications/violence/9789241564625/en/> [23.4.2020].

Hamberger, L.K., Larsen, S.E., 2015. Men's and women's experience of intimate partner violence: a review of ten years of comparative studies in clinical samples; part I. *J. Fam. Violence* 30 (6), 699–717. <https://doi.org/10.1007/s10896-015-9732-8>.

Hegarty, K.L., O'Doherty, L.J., Chondros, P., Valpied, J., Taft, A.J., Astbury, J., Gunn, J.M., 2013. Effect of type and severity of intimate partner violence on women's health and service use: findings from a primary care trial of women afraid of their partners. *J. Interpers. Violence* 28 (2), 273–294. <https://doi.org/10.1177/0886260512454722>.

Heiskanen, M., Ruuskanen, E., 2010. Men's experiences of violence in Finland 2009. Helsinki: The European Institute for Crime Prevention and Control, Affiliated with the United Nations (HEUNI). https://www.heuni.fi/material/attachments/heuni-reports/6KGSrDNOZ/HEUNI_report_71_Mens_experiences_of_violence.pdf [23.4.2020].

Hinsliff-Smith, K., McGarry, J., 2017. Understanding management and support for domestic violence and abuse within emergency departments: A systematic literature review from 2000–2015. *J. Clin. Nurs.* 26 (23–24), 4013–4027. <https://doi.org/10.1111/jocn.13849>.

Hoelle, R.M., Elie, M., Weeks, E., Hardt, N., Hou, W., Yan, H., Carden, D., 2015. Evaluation of healthcare use trends of high-risk female intimate partner violence victims. *West. J. Emerg. Med.* 16 (1), 107. <https://doi.org/10.5811/westjem.2014.12.22866>.

Kapiainen, J., Eskelinen, S., 2014. Miesten ja naisten terveystieteiden ikäryhmittäin 2011. [Men's and women's health care costs by age group in 2011.]. Tampere: Finnish Institute for Health and Welfare. <http://urn.fi/URN:ISBN:978-952-302-192-1> [23.4.2020].

Leppäkoski, T., Paavilainen, E., Åstedt-Kurki, P., 2011. Experiences of emergency care by the women exposed to acute physical intimate partner violence from the Finnish perspective. *Int. Emerg. Nurs.* 19 (1), 27–36. <https://doi.org/10.1016/j.ienj.2010.02.006>.

Merrill, R.M., Fowers, R., 2019. To what extent does sex, age and BMI impact medical and pharmacy costs? A retrospective cohort study involving employees in a large school district in the USA. *BMJ Open* 9 (5), e024078. <https://doi.org/10.1136/bmjopen-2018-024078>.

Midi, H., Sarkar, S.K., Rana, S., 2010. Collinearity diagnostics of binary logistic regression model. *J. Interdiscip. Math.* 13 (3), 253–267. <https://doi.org/10.1080/09720502.2010.10700699>.

Miller, E., McCaw, B., Humphreys, B.L., Mitchell, C., 2015. Integrating intimate partner violence assessment and intervention into healthcare in the United States: a systems approach. *J. Women's Health* 24 (1), 92–99. <https://doi.org/10.1089/jwh.2014.4870>.

Notko, M., Holma, J., Husso, M., Virkki, T., Laitila, A., Merikanto, J., Mäntysaari, M., 2011. Lähsuhdeväkivallan tunnistaminen erikoissairaanhoitossa [Encountering domestic violence in specialist health care]. *Läketieteellinen Aikakauskirja. Duodecim* 127 (15), 1599–1606.

Parekh, K.P., Russ, S., Amsalem, D.A., Rambaran, N., Langston, S., Wright, S.W., 2012. Prevalence of intimate partner violence in patients presenting with traumatic injuries to a Guyanese emergency department. *Int. J. Emerg. Med.* 5 (1), 23. <https://doi.org/10.1186/1865-1380-5-23>.

Piispa, M., Heiskanen, M., Kääräinen, J., & Siren, R., 2006. Naisiin kohdistunut väkivalta 2005 [Violence against women in Finland]. Helsinki: European Institute for Crime Prevention and Control, affiliated with the United Nations (HEUNI). https://helda.helsinki.fi/bitstream/handle/10138/152455/225_Piispa_Heiskanen_Kaariainen_Siren_2006.pdf [23.4.2020].

Reijnders, U.J.L., Ceelen, M., 2014. 7208 Victims of domestic and public violence; an exploratory study based on the reports of assaulted individuals reporting to the police. *J. Forensic Leg. Med.* 24 (2014), 18–23. <https://doi.org/10.1016/j.jflm.2014.02.006>.

Reis, B.Y., Kohane, I.S., Mandl, K.D., 2009. Longitudinal histories as predictors of future diagnoses of domestic abuse: Modelling study. *BMJ* 2009 (339), b3677. <https://doi.org/10.1136/bmj.b3677>.

Rivara, F.P., Anderson, M.L., Fishman, P., Bonomi, A.E., Reid, R.J., Carrell, D., Thompson, R.S., 2007. Healthcare utilization and costs for women with a history of intimate partner violence. *Am. J. Prev. Med.* 32 (2), 89–96. <https://doi.org/10.1016/j.amepre.2006.10.001>.

Sprague, S., Goslings, J.C., Hogentoren, C., de Milliano, S., Simunovic, N., Madden, K., Bhandari, M., 2014. Prevalence of intimate partner violence across medical and surgical health care settings: a systematic review. *Violence Against Women* 20 (1), 118–136. <https://doi.org/10.1177/1077801213520574>.

Vaughn, M.G., Fu, Q., Delisi, M., Beaver, K.M., Perron, B.E., Howard, M.O., 2010. Criminal victimization and comorbid substance use and psychiatric disorders in the United States: results from the NESARC. *Ann. Epidemiol.* 20 (4), 281–288. <https://doi.org/10.1016/j.amepre.2010.04.001>.

- doi.org/10.1016/j.annepidem.2009.11.011.
- Yau, R.K., Stayton, C.D., Davidson, L.L., 2013. Indicators of intimate partner violence: identification in emergency departments. *J. Emerg. Med.* 45 (3), 441–449. <https://doi.org/10.1016/j.jemermed.2013.05.005>.
- Youstin, T.J., Siddique, J.A., 2018. Psychological distress, formal help-seeking behavior, and the role of victim services among violent crime victims. *Vict. Offenders* 14 (1), 52–74. <https://doi.org/10.1080/15564886.2018.1547235>.
- Zachary, M.J., Mulvihill, M.N., Burton, W.B., Goldfrank, L.R., 2001. Domestic abuse in the emergency department: Can a risk profile be defined? *Acad. Emerg. Med.* 8 (8), 796–803. <https://doi.org/10.1111/j.1553-2712.2001.tb00209.x>.