

Somatic Symptoms and Diseases are more Common in Women Exposed to Violence

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BACKGROUND: Exposure to violence has been shown to have an impact on somatic health. However, our knowledge about the possible dose–response relationship between frequency of violence exposure and health is still limited.

OBJECTIVE: To study the associations between recent and repetitive exposure to violence and presence of somatic symptoms and diseases in women.

DESIGN: Cross-sectional, community-based, self-reporting survey.

PARTICIPANTS: Two thousand seven hundred thirty women aged 18–40 years (mean age 30.5 years).

MEASUREMENTS: The somatic symptom scale derived from the Primary Care Evaluation of Mental Disorders was used to obtain information on the presence of somatization. In addition, we asked about the presence of 11 diseases or organ-specific diseases. Exposure to violence was measured by the Abuse Assessment Screen.

RESULTS: Eighteen percent (486/2,730) of women surveyed reported exposure to physical violence. Three percent (94/2,730) had been forced into sexual intercourse as an adult. All somatic symptoms, and several diseases, were significantly more common in women exposed to physical and/or sexual violence as compared to nonexposed women. Women exposed to 3 or more violent episodes in the past 12 months reported a presence of 4.8 somatic symptoms and 1.2 diseases (mean) as compared to 1.8 symptoms and 0.5 diseases in nonexposed women. Women with exposure to both physical and sexual violence reported 6.0 symptoms and 1.5 diseases. The impact of violence on somatic symptoms and diseases remained after controlling for depression and sociodemographic factors.

CONCLUSIONS: Violence was associated with the presence of somatic symptoms and diseases. The more a

woman is exposed to violence, the higher the number of somatic symptoms and diseases reported is.

KEY WORDS: violence; epidemiology; women's health.

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INTRODUCTION

Violence against women is a serious problem; yet, the reporting of violence against women varies in different studies. This variation may be explained by culture, the definition of violence, the age distribution of the study population, and length of the observation period.^{1–5}

Women who are abused frequently seek medical treatment; however, they generally do not present with obvious trauma, even in emergency departments.⁶ Intimate partner violence has long-term negative health consequences, persisting beyond the period of abuse.⁷ These consequences can be manifested as poor health status, poor quality of life, and high use of health services.^{1,8–10}

Depression, anxiety, posttraumatic stress disorder,^{11,12} chronic physical health problems,^{13–16} and somatic symptoms^{17–22} are reported to be more prevalent in women exposed to violence than in nonexposed women. Most prior studies on the health consequences of exposure to violence have focused on a single health outcome, usually among populations recruited from specialized health care.^{13,14,17–20} Consequently, these results may not be generalizable, emphasizing the need for population-based studies. In addition, while many studies document the relationship between violence and physical symptoms, they did not assess repetitive trauma. Being exposed to different types of violence (childhood, community, and partner violence) and physical symptoms has been shown to be additive.³ Moreover, serious violence has a higher impact on health than less severe violence.²³ However, information about a possible dose–response relationship between frequency of violence exposure and health is limited.

Our study aim was to estimate the impact of exposure to physical and sexual violence on the presence of somatic symptoms and diseases after adjustment for depression and sociodemographic factors. We also studied the relationship between the frequency of violence exposure and the presence of somatic symptoms and diseases within a population of women in reproductive age.

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METHODS

Study Design and Recruitment

All women 18–40 years old in 2 municipalities were eligible for the study. The 2 municipalities, Nes and Sørum, are situated approximately 60 km northeast of Oslo, the capital of Norway. These municipalities are semiurban and partly rural. The population of Sørum is 10,000, and that of Nes is 17,000. Questionnaires were mailed to the women's home addresses during 1998–1999. The self-administered questionnaires were returned by mail to the study administration after completion. The data were analyzed anonymously. The study and the questionnaires were primarily designed to study mental health issues during the reproductive period. However, other questions, such as exposure to physical and sexual violence, were also addressed. The study is described in detail elsewhere.²⁴

Variables

Somatic Symptoms and Diseases. The somatic symptom scale, derived from the Primary Care Evaluation of Mental Disorders (PRIME-MD),²⁵ included the following somatic symptoms (no/yes): stomach pain, back pain, pain in arms/legs/joints, menstrual pain/problems, pain/problems during sexual intercourse, headache, chest pain, dizziness, fainting spells, feeling your heart pound or race, shortness of breath, constipation/loose bowels/diarrhea, feeling tired/having low energy, and trouble sleeping. In addition, we included questions assessing the presence of other diseases common in this population including high blood pressure, asthma, fibromyalgia, migraine, diabetes, cancer, hyper/hypothyroidism, and organ-specific diseases (cardiovascular disease, disease in the muscular or skeletal system, disease in the kidney or urinary tract, or disease in the gastrointestinal tract).

Exposure to Violence. The following questions on exposure to physical violence were adapted from the Abuse Assessment Screen²⁶: "Have you ever, after the age of 18 years, been hit, slapped, kicked, or otherwise physically hurt by someone?" (no/yes) and "Have you during the last twelve months been hit, slapped, kicked, or otherwise physically hurt by someone?" (no/yes). "If yes, how many times?" The questions on exposure to sexual violence were as follows: "Have you ever, as an adult, been coerced into sexual activities?" (no/yes), "Have you ever, as an adult, been forced into sexual activities?" (no/yes). "If yes, did it happen during the last twelve months?" (no/yes). While there is currently no gold standard for measuring exposure to violence, the Abuse Assessment Screen has previously been shown to be valid²⁶ and is comparable to the Conflicts Tactics Scale²⁷ or the Index of Spouse Abuse.²⁸ These latter 2 scales focus on partner violence. The Abuse Assessment Screen focuses more generally on violence and does not include questions about the relationship between the victim and the perpetrator. Additionally, we wanted to use a brief instrument with little space requirement in the questionnaire and which included level of severity and frequency of exposure to violence.

Potential Confounding Variables. Potential confounding variables we assessed included depression, economic problems during the past year, education level (university level/high school/primary school), parity (no children/1 child/>1 child), age (<30 or ≥30 years), and marital/cohabital status. The presence of depressive symptoms during the past week was measured by the Edinburgh Postnatal Depression Scale.^{29,30} Depression was defined as a score ≥10. The question assessing economic problems was: "Did you have any economic problems during the last year?" (none/a few/a lot/excessively large problems). This question is a subjective measure that has been used in several population-based questionnaire studies in Norway³¹ [HUNT Research Center (NTNU), Verdal, Norway. The HUNT web site: <http://www.hunt.ntnu.no>].

Statistical Methods

The presence of 3 or more somatic symptoms and the presence of 2 or more diseases were dependent variables in separate models. We used a cutoff of 3 symptoms based on the instructions in the original PRIME-MD study and on subsequent studies, suggesting this as a valid cutpoint.^{32,33} To define a cutoff for the number of somatic diseases, we used the upper 10% of the distribution in the population sample as cutoff, which was 2 or more diseases. Chi-square tests were used to assess differences in the presence of somatic symptoms or diseases according to exposure to violence during the past 12 months. One-way ANOVA was used to assess differences in mean number of somatic symptoms and diseases according to level of exposure to violence. In addition, the impact of physical violence was studied, after adjustment for potentially confounding variables, as adjusted odds ratios in logistic regression analyses. The study was approved by the Norwegian Data Inspectorate and the Regional Committee for Ethics in Medical Research.

RESULTS

Of the 4,303 women between 18 and 40 years old living in the 2 municipalities identified through the Norwegian Central Person Registry, 182 had moved and did not receive the questionnaire. Among the remaining women, 2,730 (66%) returned the questionnaire. Their mean age was 33.2 years (range 18–40; SD 4.9). The majority of women had children (67%) and were either married or cohabitant (73%). The nonresponders did not differ significantly in age from the responders (mean 30.5 years; SD 6.8).

Prevalence of Physical and Sexual Violence

Eighteen percent (486/2,730) of all women reported exposure to physical violence as an adult. Four percent (108/2,730) had been exposed to violence within the past 12 months. Twelve percent (339/2,730) had been coerced and 3% (94/2,730) forced into sexual activities as an adult. More than half (59/108) of the women who had been exposed to physical violence during the past 12 months had also been coerced or forced into sexual activities in their adult lives.

Presence of Somatic Symptoms and Diseases

Women exposed to physical or sexual violence were significantly more likely to report somatic symptoms (Table 1). This finding was consistent for all somatic symptoms included in the questionnaire. In addition, women with higher rates of exposure to physical or sexual violence were more likely to have comorbid diseases. Diseases among those experiencing physical violence reached statistical significance for 3 categories (asthma, migraine, and disease in the kidney or urinary tract), whereas 8 of the 11 diseases assessed were more prevalent among women experiencing sexual violence (Table 1).

Number of Symptoms and Diseases According to Violence Exposure

There was a dose-response relationship between the number of episodes of physical violence experienced in the past 12 months and the number of somatic symptoms and diseases (Table 2). Women exposed to 3 or more episodes of physical violence in the past 12 months reported an average of 4.8 different symptoms and 1.2 diseases, as compared to 1.8 symptoms ($p < 0.001$) and 0.5 diseases ($p < 0.001$) in nonexposed women. Women forced into sexual intercourse in adult life reported an average of 3.7 different symptoms and 1.1 diseases, as compared to 1.7 symptoms ($p < 0.001$) and 0.5 diseases ($p < 0.001$) in women who had not been coerced or forced into sexual activities. The combination of physical and sexual violence was worse than either alone, with women exposed to both physical and sexual violence within the past

12 months reporting an average of 6.0 different somatic symptoms and 1.5 diseases.

Control for Potentially Confounding Factors

The impact of violence on somatic symptoms and diseases did not change after we controlled for potentially confounding factors (Table 3). Among women exposed to physical violence 3 times or more within the past year, the adjusted odds ratio for having 3 or more somatic symptoms was 6.0 (95% CI: 1.8–20.4) compared to nonexposed women. Similarly, the adjusted odds ratio for having 2 or more diseases was 2.4 (95% CI: 1.1–7.0). This effect appeared to persist over time; women with a history of violence exposure prior to the immediately preceding year were more likely to have somatic symptoms than women never exposed. Among women forced into sexual intercourse in adult life, the adjusted odds ratio for 3 or more somatic symptoms was 2.2 (95% CI: 1.3–3.6) and 2.7 (95% CI: 1.6–4.7) for 2 or more diseases as compared to nonexposed women. Depressive symptoms and economic problems during the past year were also associated with somatic symptoms and diseases. Furthermore, women with children had a slightly increased risk for somatic symptoms and diseases as compared to women without children.

DISCUSSION

Eighteen percent (486/2,730) of the women in this study, 18–40 years old, had been exposed to physical violence and 3%

Table 1. Percent (Number) Exposed to Physical (Hit, Slapped, Kicked, or Otherwise Physically Hurt by Someone) or Sexual Violence Within the Past 12 Months According to Reported Somatic Symptoms and Disease Among 2,730 Women 18–40 Years Old

	Exposed to violence			Coerced or pressed into sexual activities		
	No (number (%))	Yes (number (%))	<i>p</i> value	No (number (%))	Yes (number (%))	<i>p</i> value
Physical symptoms						
Stomach pain	79 (3)	29 (9)	<0.001	312 (13)	81 (23)	<0.001
Back pain	65 (3)	43 (6)	<0.012	65 (3)	43 (6)	<0.012
Pain in arms/legs/joints	78 (4)	30 (6)	<0.027	276 (12)	117 (22)	<0.001
Menstrual pain/problems	57 (3)	50 (5)	<0.028	197 (12)	189 (19)	<0.001
Pain/problems during sexual intercourse	94 (4)	14 (8)	<0.004	348 (14)	45 (26)	<0.001
Headaches	57 (3)	51 (7)	<0.001	236 (12)	157 (20)	<0.001
Chest pain	97 (4)	11 (8)	<0.015	357 (14)	36 (26)	<0.001
Dizziness	73 (3)	35 (10)	<0.001	311 (13)	82 (22)	<0.001
Fainting spells	102 (4)	6 (12)	<0.004	383 (14)	10 (20)	<0.255
Feeling your heart pound/race	85 (3)	23 (12)	<0.001	344 (14)	49 (26)	<0.001
Shortness of breath	95 (4)	13 (15)	<0.001	374 (14)	19 (21)	<0.073
Constipation/loose bowels/diarrhea	74 (3)	34 (8)	<0.001	284 (12)	109 (24)	<0.001
Feeling tired/low energy	39 (2)	69 (8)	<0.001	208 (12)	185 (20)	<0.001
Trouble sleeping	80 (3)	28 (11)	<0.001	331 (13)	62 (24)	<0.001
Diseases						
High blood pressure	104 (4)	4 (5)	<0.569	376 (14)	17 (22)	<0.051
Asthma	90 (4)	18 (7)	<0.009	346 (14)	47 (18)	<0.062
Fibromyalgia	106 (4)	2 (4)	<0.895	378 (14)	15 (27)	<0.006
Migraine	84 (4)	24 (7)	<0.007	325 (14)	68 (18)	<0.015
Diabetes	107 (4)	1 (5)	<0.789	386 (14)	7 (35)	<0.008
Cancer	108 (4)	0 (0)	<0.586	392 (14)	1 (14)	<0.993
Hyper/hypothyroidism	104 (4)	4 (7)	<0.300	377 (14)	16 (26)	<0.010
Cardiovascular disease	107 (4)	1 (17)	<0.117	392 (14)	1 (14)	<0.993
Disease in the muscular or skeletal system	88 (4)	20 (6)	<0.068	311 (13)	82 (24)	<0.001
Disease in the kidney or urinary tract	90 (4)	18 (11)	<0.001	348 (14)	45 (26)	<0.001
Disease in the gastrointestinal tract	103 (4)	5 (6)	<0.271	377 (14)	16 (20)	<0.180

Table 2. Dose-Response Relationship Between Violence, Somatization and Comorbid Diseases

	Number of women	Mean number of somatic symptoms (95% CI)	Mean number of comorbid diseases (95% CI)
Physical violence* exposure during last 12 months			
Not exposed	2,645	1.8 (1.7-1.9)	0.5 (0.5-0.6)
One time	44	2.8 (2.0-3.6)	0.8 (0.4-1.1)
Two times	17	3.5 (2.4-4.6)	0.9 (0.5-1.3)
Three times or more	24	4.8 (3.6-6.0)	1.2 (0.8-1.6)
Sexual abuse in adult life			
Never	2,216	1.7 (1.6-1.8)	0.5 (0.4-0.5)
Coerced, but never forced	339	2.7 (2.4-3.0)	0.7 (0.6-0.8)
Forced	94	3.7 (3.2-4.3)	1.1 (0.9-1.4)
Both physical and sexual violence during last 12 months			
No	2,301	1.9 (1.8-2.0)	0.5 (0.5-0.6)
Yes	13	6.0 (4.3-7.7)	1.5 (0.5-2.4)

Not all women responded to each question; thus, the denominator varies
*Hit, slapped, kicked, or otherwise physically hurt by someone

had been forced into sexual intercourse as adults. Both somatic symptoms and diseases were strongly associated with exposure to violence, with a step-wise relationship between the frequency of violence exposure and the number of somatic symptoms and diseases. This effect persisted after adjusting for depression and sociodemographic factors. A history of

exposure in the more distant past also increased somatization and the likelihood of experiencing other diseases.

Two previous studies reported a dose-response relationship between the level of exposure to violence and the number of somatic symptoms.^{3,23} One study focused on the number and type of violence,³ the other on the severity.²³ Our study shows that there is also a dose-response relationship between the frequency of violence exposure and the number of somatic symptoms. Our study was performed in a large population-based sample, whereas the 2 other studies recruited among patients in health care settings.

Our study is consistent with previous research finding an association between violence exposure and impaired physical health. Whereas violence exposure has a well-documented negative effect on mental health, our results indicate that impaired mental health does not fully explain the effect of violence on physical health. Hence, other mechanisms must also be involved. Exposure to violence is a stressful event. Acute and/or chronic stress has been linked to increased vulnerability to disease and illness.³⁴ Although the exact pathophysiological mechanisms are unknown, it is known that stress has an impact on the autonomic nervous system; the hypothalamic-pituitary-adrenal axis; and the cardiovascular, metabolic, and immune systems.³⁴ Research has also suggested that a painful event may have long-lasting effects on pain response and/or perception of pain.³⁵ It is possible that violence leads to an increased awareness of somatic symptoms.

There are a number of limitations for our study. First, the respondents understanding and interpretation of some ques-

Table 3. The Impact of Physical Violence on Somatic Symptoms (≥3) and Diseases (≥2) in 2,730 Women in Norway, Controlled for High Depressive Score and Sociodemographic Variables

	≥3 physical symptoms		≥2 comorbid diseases	
	Yes %	Adjusted odds-ratio (95% CI)	Yes %	Adjusted odds-ratio (95% CI)
Physical violence				
Not exposed (n=2,131)	25	1.0	12	1.0
Exposed, but not last year (n=373)	44	1.5 (1.1-2.0)*	22	1.3 (0.9-1.9)
Exposed 1-2 times last year (n=84)	58	2.6 (1.6-4.4)*	25	1.9 (1.0-3.6)*
Three times or more last year (n=24)	75	6.0 (1.8-20.4)*	50	2.4 (1.1-7.0)*
Sexual abuse				
Never (n=1,849)	25	1.0	12	1.0
Coerced, but never forced (n=339)	44	1.6 (1.2-2.1)*	22	1.3 (0.9-1.9)
Forced (n=94)	63	2.2 (1.3-3.6)*	38	2.7 (1.6-4.7)*
Depression (EPDS ≥10)*				
No (n=2,342)	26	1.0	12	1.0
Yes (n=346)	57	2.8 (2.1-3.7)*	28	1.9 (1.3-2.7)*
Economic problems last 12 months				
None (n=1,646)	23	1.0	12	1.0
A few problems (n=313)	41	2.1 (1.6-2.8)*	18	1.1 (0.7-1.7)
A lot of problems (n=230)	47	2.0 (1.5-2.8)*	22	1.4 (0.9-2.2)
Excessively large problems (n=125)	58	2.2 (1.4-3.4)*	31	1.9 (1.1-3.3)*
Parity				
No children (n=913)	23	1.0	11	1.0
1 child (n=533)	32	1.4 (1.0-1.9)*	15	1.8 (1.2-2.9)*
>1 child (n=1,284)	33	1.4 (1.0-1.9)*	16	1.5 (1.0-2.3)*
Education level				
University (n=811)	24	1.0	12	1.0
High school (n=1,475)	31	1.3 (1.0-1.7)*	14	1.2 (0.8-1.7)
Primary school (n=360)	37	1.5 (1.1-2.1)*	18	1.4 (0.9-2.2)
Age (years)				
<30 (n=1,092)	27	1.0	11	1.0
≥30 (n=1,527)	32	1.2 (0.9-1.6)	16	1.4 (0.9-2.0)

Marital/cohabital status was included in the multivariate logistic regression analyses but was not significantly associated with somatic symptoms and diseases and, therefore, was not included in the table

EPDS = Edinburgh Postnatal Depression Scale

*Presence of depressive symptoms within the last week was measured by the EPDS. Depression was defined as a score of ≥10

tions is not known, for example the difference between “forced” and “coerced” sex. A tendency among respondents towards answering questions in general as either yes or no on the questionnaire could potentially produce biased estimates.³⁶ However, there is little reason to believe that women who tend to report severe sexual violence also tend to report more somatic symptoms, and our findings are consistent with other studies showing a relationship between violence exposure and somatization. Somatic symptoms are more common than exposure to violence, overreporting symptoms would tend to underestimate the impact of violence exposure on somatic symptoms and diseases. Another concern is that women could underreport their exposure to violence; questionnaire anonymity helped decrease this possibility. Additionally, 34% of our sample did not return the questionnaire. For a population-based sample, the response rate in our study was quite high, and the responders did not differ in age from the nonresponders. Finally, our study was cross-sectional; we cannot prove causation between violence exposure and poor somatic health. Low socioeconomic status² and depression^{37,38} have been associated with both physical violence and poor health and are thus potential confounding factors. In our study, we controlled for economic problems during the past year, depression, education level, parity, and age, but the impact of violence on physical health remained.

The strong impact of violence on physical health has obvious implications for patient–doctor communication. In addition to being aware of violence as an underlying cause of somatic symptoms and diseases, physicians need to ask about violence among their female patients presenting with many somatic symptoms. Time pressure, inadequate knowledge of referral options, and poor access to management information have been identified as reasons for not asking about physical abuse.³⁹ Discomfort among physicians about raising this issue may be a potential barrier,^{40,41} as well as uncertainty on what to do with such information once obtained. However, women who are asked about exposure to violence say they welcome such questions,⁴² which suggests that physicians’ fears about patient reactions are largely unfounded. Research on interventions to help women with a history of exposure to violence and sexual trauma and to determine whether exposure to violence leads to subsequent increased somatization and disease burden is needed.

In conclusion, our results show high correlations between levels of physical and sexual violence and number of somatic symptoms and diseases. We found this result was consistent across all symptom categories and that there was a dose–response relationship between violence and symptoms. In addition, even a remote history of violence was associated with somatization, and the combination of physical and sexual violence was particularly harmful. Further research is needed to better understand the pathophysiological mechanisms involved. Clinicians should ask about physical and sexual violence among their women patients presenting with somatic symptoms.

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