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Chronic Pain in Women Survivors of Intimate Partner Violence

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Abstract: **In this descriptive study of chronic pain in a community sample of 292 women who had separated from their abusive partners on average 20 months previously, more than one-third experienced high disability pain as measured by Von Korff's Chronic Pain Grade. Beyond the usual pain locations associated with abuse, 43.2% reported swollen/painful joints. More interference in daily life was attributed to joint pain than to back, head, stomach, pelvic or bowel pain. Women with high disability pain were more likely to have experienced child abuse, adult sexual assault, more severe spousal abuse, lifetime abuse-related injuries, symptoms of depression and post-traumatic stress disorder, lifetime suicide attempts, difficulty sleeping, and unemployment. High disability pain also was associated with visits to a family doctor and psychiatrist and use of medication in more than prescribed dosages. Less than 25% of women with high disability pain were taking opioids, or prescription nonsteroidal anti-inflammatory medications. Interestingly, high disability pain was not related to smoking, use of street drugs, potential for alcohol dependence, age, income, or education. The findings add to knowledge of severity and patterns of chronic pain in abused women and support the need for further multivariate analysis of the relationships among abuse experiences, mental health, and chronic pain severity to better inform decisions regarding diagnosis and treatment.**

Perspective: ***Understanding patterns of chronic pain in abuse survivors and their associations with abuse history, mental health symptoms, health service use, and medication is important for clinical assessment and intervention. Chronic pain persisted long after leaving abusive partners and extended beyond usual locations (back, headache, pelvic, gastrointestinal) to include swollen/painful joints.***

Key words: *Chronic pain, intimate partner violence, women's health, abuse, chronic pain grade.*

In Canada, 18% of women over the age of 12 experience chronic pain, as compared with 14% of men.[34] Chronic pain is one of many serious long-term health consequences of intimate partner violence (IPV).[5] IPV is a pattern of physical, sexual, and/or emotional violence by an intimate partner in the context of coercive control.[47] According to a national prevalence survey of women's experiences of specific acts of physical and sexual violence by a male partner,[27] 30% of Canadian women are affected in their lifetime.[42] Physical violence included assault, or threats of assault, using hands, feet, objects, or weapons whereas sexual violence referred to any form of nonconsensual or forced sexual activity or touching.[27] In several large controlled investigations, higher rates of chronic pain have been found in women who have experienced IPV than in those who have not.[6,12,39] Disability related to chronic pain also is more likely in women with a history of IPV than in those without.[13,52] Such disability may interfere with physical activity, participation in family and social activities and/or the capacity to work, often leading to job change or job loss and subsequent loss of wages.[2] Thus, for women who have

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left their abusive partners and are grappling with providing for themselves and their children, chronic pain may magnify their challenges.

Our understanding of chronic pain among women who have experienced IPV is largely limited to the recognition that it is one of the many health problems more prevalent among those with an abuse history than those without.[6,12] Studies of various clinical populations have demonstrated associations between a history of IPV and/or child abuse and chronic abdominal pain[30] as well as with chronic pelvic pain.[31,50] Women with a history of abuse and chronic pain have increased rates of anxiety disorders,[43] depression,[29,51] health care utilization, and substance use.[21] Chronic pain was related to both abuse history and to post-traumatic stress disorder (PTSD) but not depression in one investigation that tested whether PTSD mediated the relationship between IPV and physiological outcomes (proinflammatory response and chronic pain) from IPV.[53] Further, IPV-related injury has been shown to increase the odds of generalized chronic pain.[13]

Despite the evidence that chronic pain is a serious problem that interferes with health and well-being in women with a history of abuse, little is known about the actual severity and patterns of chronic pain in community samples of women abuse survivors. Using data collected from a community sample of women in the early years after leaving abusive partners, we sought first to describe the pattern of severity of chronic pain as measured by the Chronic Pain Grade (CPG).[49] Our second goal was to illustrate the variation in site, frequency and interference of pain reported as problematic in the past month by chronic pain severity. Thirdly, we aimed to describe the relationships between chronic pain severity as indicated by disability category (high/low) and (1) women's abuse histories, (2) selected health indicators, (3) health service use, and (4) selected demographic variables. Our final goal was to document the pattern of use of selected medications by chronic pain severity.

Methods

We analyzed baseline data collected as part of the Women's Health Effects study (WHES), an ongoing longitudinal prospective investigation of patterns of women's physical and mental health in the early years after leaving an abusive male partner.[20] The WHES received ethical approval from the Research Ethics Boards at the University of Western Ontario, the University of New Brunswick, and the University of British Columbia. Through community advertising, we recruited 309 adult, English-speaking women from 3 Canadian provinces (Ontario, New Brunswick, and British Columbia) who met the inclusion criteria of having (1) separated from an abusive partner for at least 3 months but no more than 3 years before recruitment, and (2) screened positive on the Abuse Assessment Screen.[37] Informed consent was received from each participant before data collection. Baseline data were collected between June 2004 and January 2006 through structured interviews focussing on resources, service use and demographic characteristics, and in-depth abuse histories and health assessments conducted by a registered nurse.[20]

Measures

Chronic pain severity was measured as a function of pain intensity and pain-related disability using the 7-item CPG scale.[49] For pain intensity, participants are asked to rate their current pain intensity, worst pain intensity in past 6 months, and average pain intensity in past 6 months on separate scales from 0 (no pain) to 10 (pain as bad as it could be). The pain intensity score (0–100) is derived by calculating the mean of the 3 intensity items and multiplying by 10. Similarly, pain disability is measured with 3 items (0–10) measuring pain-related interference with daily activities in past 6 months, change in ability to take part in recreational, social, and family activities in past 6 months, and change in ability to work, including housework, in past 6 months. The disability score (0–100) is calculated by multiplying the mean of the 3 items by 10. Disability days are measured with a single item asking how many days have been lost from usual activities (work, school, or housework) because of pain in past 6 months. Disability points are awarded separately for disability scores and disability days. CPG is derived from pain intensity scores and the total number of disability points: Grade 0 = pain free; Grade I = low disability, low intensity; Grade II = low disability, high intensity; Grade III = high disability, moderately limiting; Grade IV = high disability, severely limiting. CPGs may be grouped into categories to differentiate between high and low disability: High Disability (Pain Grades III and IV) and Low Disability (Pain Grade 0, I, and II).[49] The CPG scale has demonstrated adequate reliability and validity in both community and clinical samples of adults.[32,38,45] In this study, internal consistency of the pain intensity and pain disability scores were acceptable (α = .84 and .93, respectively).

Lifetime injuries due to abuse, and the occurrence and frequency of selected physical and mental health symptoms in the past month were measured with selected items from the self-report Partner Abuse Symptom Scale (PASS) (Ford-Gilboe, Campbell, Merritt-Gray, Lent, Samuels-Dennis, and Wilk, manuscript in preparation). The PASS was created for this study by expanding the items and response choices on the Miller Abuse Physical Injury and Symptom Scale (MAPSAIS)[6] so that a broader range of physical and mental health symptoms associated with IPV are captured. Symptoms that women perceived to be problems in their lifetime were measured with 44 yes/no items including specific types of pain (back, headache, vaginal/pelvic, bowel problems, upset stomach/heartburn, general aches and pains, and swollen/painful joints). For each symptom experienced, women were asked to rate the past month symptom frequency ranging from 0 (never) to 4 (every day), and the extent to which the symptom had interfered with ability to do everyday activities (work, care for self/children, get around) from 0 (has not interfered) to 10 (completely interfered).

Severity of physical and nonphysical IPV was measured using the 30-item Index of Spouse Abuse (ISA).[22] On a scale of 0 (never) to 4 (very frequently), participants were asked to rate the frequency of specific abusive acts directed toward them by their ex-partner. Individual items are weighted for severity and summed for a possible range of 0 to 100. The ISA is a reliable and valid tool for use with diverse populations.[4] Internal consistency in this study was .86. Women's exposure to other types of abuse was measured by their self-reports (yes/no) of (1) abuse as children, (2) harassment from their ex-partners since leaving, and (3) sexual assault as an adult by someone other than the ex-partner.

Depressive symptoms were measured using the 20-item Center for Epidemiologic Studies-Depression (CES-D) scale which has established reliability and validity with general populations and with abused women.[26,41] In this study, the Cronbach's α was .93. Women were asked to rate symptom frequency in the past week on a 4-point scale of *rarely* to *most of the time*. Summed total scores range from 0 to 60 with higher scores reflecting more symptoms of depression. Scores of 16 to 21 reflect mild to moderate depressive symptoms, whereas scores greater than 21 reflect high depressive symptoms. A limitation of the CES-D is its limited positive predictive value for a diagnosis of depression in some populations; over two-thirds of low income women with CES-D scores above 16 did not meet the clinical criteria for major depressive disorder.[46]

The 17-item Davidson Trauma Scale (DTS)[16,17] was used to assess symptoms of PTSD. Participants who reported having experienced a traumatic event were asked to rate the symptoms of PTSD experienced in the past week by frequency (0 = not at all to 4 = every day) and severity (0 = not at all distressing to 4 = extremely distressing). Symptoms were grouped into categories of intrusion, hypervigilance, and avoidance. Separate frequency and severity scores were computed by summing the responses to applicable items (range, 0–56), whereas an overall score was created by summing the frequency and severity scores (range, 0–136). Cronbach's α in this study was .95 for overall score. Using standardized scoring for the DTS, women with a score of 40 or higher and who had a minimum number of symptoms in the categories of intrusion, hypervigilance and avoidance were classified as having symptoms consistent with PTSD based on the DSM-IV diagnostic criteria.[16]

With respect to prescription and over-the-counter (OTC) medication usage, women were asked about usage in the past month, and those who replied affirmatively were asked to list the names of their medications. Information about smoking, use of street drugs, and use of medication in excess of prescribed dosage in the past month also was gathered using self-report, single item (yes/no) questions. Potential for alcohol dependence was measured using a cut-off score of 2 on the 5-item self-report TWEAK (Tolerance, Worried, Eye-opener, Amnesia, K/cut down), an alcohol screening tool judged to be optimal for screening women.[1] Visits in the past month to a family doctor, emergency department (ED), and psychiatrist were also assessed through single item (yes/no) questions.

Data Analysis

Descriptive statistics were computed for all variables. To explore the pattern of chronic pain severity, descriptive statistics were computed for pain intensity, pain disability, days lost, and pain location by CPG (0-IV). To facilitate meaningful interpretation of tests of association, disability categories (high, low) of chronic pain severity were used to examine group differences in women's abuse histories, health status, health service use, medication use, and demographic characteristics. χ^2 tests ($df = 1$)

Table 1. Abuse History, Health Service Use, and Health in 292 Survivors of IPV

	*n**	*Descriptive Statistics*
Abuse history		
Severity of spousal abuse (ISA)		
Mean (SD); range	270	54.3 (19.4); 18.2–100
Abused as a child		66.1 (193)
Adult sexual assault history		39.4 (115)
Abuse ongoing since leaving		37.7 (110)
Abuse-related injuries ever	291	82.5 (240)
Taken to emergency department for abuse-related injuries ever		45.5 (133)
Mental Health		
Depressive symptoms (CES-D)		
None		27.7 (81)
Mild to moderate		14.4 (42)
High		57.9 (169)
PTSD symptoms (DTS)	275	51.6 (142)
Attempted suicide in lifetime		30.8 (90)
Suicidal thoughts in past month		17.5 (51)
Substance use		
Currently smoking		44.2 (129)
Street drugs	289	27.3 (79)
Potential alcohol dependence screen (TWEAK)	291	
No alcohol problem		31.3 (91)
Potential alcohol problem		47.8 (139)
Not drinking past year		21 (61)
Use medication in more than recommended dosage in past month	291	15.5 (45)
Other symptoms in past month		
Memory loss	290	43.4 (136)
Difficulty sleeping		69.5 (203)
Fatigue		76 (222)
Health service use past month		
Family doctor		55.8 (163)
Psychiatrist		13.4 (39)
Emergency department		11.6 (34)

Abbreviations: IPV, intimate partner violence; ISA, Index of Spouse Abuse; CES-D, Center for Epidemiologic Studies-Depression; DTS, Davidson Trauma Scale; PTSD, post-traumatic stress disorder; TWEAK, Tolerance, Worried, Eye-opener, Amnesia, K/cut down.

NOTE. Unless otherwise specified, all items were measured by self-report (yes/no) and are reported by frequency: % (n).

*n = 292 unless otherwise specified.

were calculated for categorical variables whereas *t* tests were calculated for continuous variables. The significance level for all analyses was $P < .05$.

Results

Description of the Sample

The sample size for the current analysis is 292, based on the number of women for whom complete chronic pain data were available. Women had left their abusive partners an average of 20 months previously (range, 3–40.5, SD = 10.2). Their mean age was 39.4 years (SD = 9.9; range, 19–63) and they had completed an average of 13.5 years of education (SD = 2.6; range, 6–22 years). Almost half (44.3%; n = 139) were employed, whereas 32.2% (n = 94) were on social assistance, and 11.6% (n = 34) received a disability pension. Their annual incomes ranged from $0 to $95,000 Canadian per year, with a mean income of $20,491 (SD = $17,307; median, $15,600). Approximately half of the women 57.9% (n = 169) had a dependent child at home. Descriptive statistics for measures of abuse history, health, and health service use are reported in Table 1.

Pattern of Chronic Pain

In Table 2, chronic pain severity in the sample as measured by CPG is reported. Additionally, variation in pain intensity, pain disability and number of days lost from usual activities in past 6 months by CPG is shown. Only 5.5% (n = 16) of women were pain free (CPG 0), whereas more than one-third (35.3%; n = 103) experienced high disability, moderately or severely limiting pain (CPG III or IV). Of the 57.9% (n = 169) of women with dependent children at home, almost one-third (n = 54) had experienced high disability pain in the past 6 months. On average, women reported pain in 3 different sites (M = 3.38, SD = 1.99; range, 0–7). Women with high disability pain (CPG III or IV) experienced pain in significantly more locations than women with low disability pain (CPG 0, I or II) (M = 4.36, SD = 1.66 vs M = 2.83, SD = 1.95, t (235.6) = −6.93, $P < .001$).

Problematic pain in the past month in terms of site, interference and frequency by pain severity (CPG) is reported in Table 3. More than half of the women had experienced problematic back pain (n = 187), headaches (n = 185), or general aches and pains (n = 145) in the past month, and less than 20% (n = 51) reported pelvic/vaginal pain. For all pain sites except pelvic/vaginal pain, the mean degree of interference in daily activities increased with each pain grade. Across pain grades, the mean degree of interference for vaginal/pelvic pain was less variable than for other pain sites and was greater for Grade I (M = 4.21; 3.26) than for Grade II (M = 3.54; SD = 3.04) and similar for Grades III (M = 5.56; SD = 2.56) and IV (M = 5.56; SD = 3.01). The highest mean degree of interference was for swollen/painful joints (M = 5.48, SD = 3.14), followed by aches and pains (M = 4.91, SD = 3.38), pelvic/vaginal pain (M = 4.69; SD = 3.05), and back pain (M = 4.57; SD = 3.37). More than half of women with swollen/painful joints had moderately or severely limiting pain with very high degrees of interference (Grade III: M = 6.08, SD = 2.87; Grade IV: M = 7.69, SD = 2.01) and most of these women experienced pain several times a week or daily.

Pain Disability and Abuse History, Health, and Health Service Use

Women with high disability CPGs reported more severe spousal abuse (M = 60.32, SD = 21.01) than did those with low disability CPGs (M = 51.25, SD = 17.79, t (157) = −3.53, $P = .001$). High disability CPGs were associated both with a history of child abuse ($\chi^2 = 11.18$, $P = .001$) and with a history of adult sexual assault by someone other than the abusive ex-partner ($\chi^2 = 6.84$, $P = .009$). Ongoing partner abuse was not associated with disability categories. However, women who had experienced abuse-related injuries ever in their lifetime were more likely to have high disability CPGs ($\chi^2 = 12.35$, $P < .001$). As well, high disability CPGs were more likely in women who had visited the ED for abuse-related injury ($\chi^2 = 15.65$, $P < .001$).

Depressive symptoms ($\chi^2 = 10.02$, $P = .002$), symptoms of PTSD ($\chi^2 = 12.02$, $P = .001$), and ever having attempted suicide ($\chi^2 = 7.40$, $P = .007$) were each associated with high disability CPGs. No association was found between suicidal thoughts in the past month and disability categories. High disability CPGs were associated with difficulty sleeping ($\chi^2 = 19.03$, $P < .001$), fatigue ($\chi^2 = 9.40$, $P = .002$), and memory loss ($\chi^2 = 17.13$, $P < .001$) in the past month. Use of medication in more than recommended dosages was associated with higher disability CPGs

Table 2. Chronic Pain Grade in 292 Survivors of Intimate Partner Violence

	Overall	Grade 0 Pain Free	Grade I Low Disability: Low Intensity	Grade II Low Disability: High Intensity	Grade III High Disability: Moderately Limiting	Grade IV High Disability: Severely Limiting
Chronic pain grade, % (n)		5.5 (16)	37.3 (109)	21.9 (64)	14.4 (42)	20.9 (61)
Pain intensity*	48.9 (25.7); 0–100	0	28.3 (12.8); 3.3–46.7	62.9 (11.6); 50–96.7	62.4 (15.9); 33–100	74.2 (14.3); 40–100
Pain disability*	37.4 (31.9); 0–100	0	14.6 (16.2); 0–63.3	27.8 (17.5); 0–66.7	63.2 (19.6); 20–100	80 (13.0); 53.3–100
Days lost to usual activity*	23.9 (44.7); 0–180	0	2 (3.4); 0–14	4.2 (6.1); 0–30	24 (27); 0–100	90 (57.8); 15–180

*Mean (SD); range.

Table 3. Problematic Pain in Past Month (Site, Interference, Frequency) by Chronic Pain Grade (CPG) (n = 292)

Pain Site Last Month: % (N)	*Grade 0* Pain Free 5.5 % (16)*	*Grade I Low Disability: Low Intensity 37.3% (109)*	*Grade II Low Disability: High Intensity 21.9% (64)*	*Grade III High Disability: Moderately Limiting 14.4% (42)*	*Grade IV High Disability: Severely Limiting 20.9% (61)*
Back pain, 64% (187)†	1.4 (4)	18.5 (54)	15.8 (46)	11 (32)	17.5 (51)
Degree of interference, 4.57 (3.37)‡	.75 (1.5)	1.98 (2.38)	3.91 (2.64)	6.22 (2.25)	7.31 (2.87)
Experienced several times a week or daily†	1.1 (2)	9.4 (27)	9.9 (29)	8.9 (26)	15.4 (45)
Headaches, 63.6% (185)†	1.1 (2)	23.7 (69)	15.5 (45)	8.6 (25)	15.1 (44)
Degree of interference, 4.39 (3.5)‡	0	3.3 (3.16)	3.60 (3.24)	6.04 (3.10)	6.11 (3.52)
Experienced several times a week or daily†	0	8.3 (24)	6.5 (19)	5.8 (17)	7.9 (23)
Aches and pains, 50.9% (148)†	.3 (1)	11.7 (34)	13.7 (40)	8.9 (26)	16.2 (47)
Degree of interference, 4.91 (3.38)‡	0	2.72 (2.90)	4.53 (2.80)	5.26 (3.38)	6.77 (3.12)
Experienced several times a week or daily†	.3 (1)	5.8 (17)	10.3 (30)	6.5 (19)	14 (41)
Bowel problems, 49.7% (144)†	1 (3)	14.8 (43)	10.7 (31)	8.3 (24)	14.8 (43)
Degree of interference, 4.08 (3.25)‡	1.67 (2.89)	2.18 (2.40)	3.64 (2.90)	5.46 (3.08)	5.81 (3.19)
Experienced several times a week or daily†	1.1 (2)	8.3 (24)	6.2 (18)	5.4 (16)	9.9 (29)
Upset stomach/heartburn, 46.4% (135)†	0.3 (1)	13.1 (38)	11.3 (33)	7.9 (23)	13.7 (40)
Degree of interference, 4.03 (3.31)‡	0	2.78 (3.00)	2.82 (2.60)	4.78 (2.92)	5.85 (3.43)
Experienced several times a week or daily†	0.3 (1)	5.4 (16)	7.5 (22)	4.8 (14)	9.6 (28)
Swollen/painful joints, 43.2% (124)†	0 (0)	9.4 (27)	10.8 (31)	8.4 (24)	14.6 (42)
Degree of interference, 5.48 (3.14)‡	0	2.59 (2.52)	4.55 (2.76)	6.08 (2.87)	7.69 (2.01)
Experienced several times a week or daily†	0	3.8 (11)	7.5 (22)	7.2 (21)	13.4 (39)
Pelvic/vaginal pain, 17.5% (51)†	0 (0)	4.8 (14)	4.5 (13)	3.1 (9)	5.1 (15)
Degree of interference, 4.69 (3.05)‡	0	4.21 (3.26)	3.54 (3.05)	5.56 (2.56)	5.56 (3.01)
Experienced several times a week or daily†	0	.3 (1)	1.4 (4)	1.4 (4)	3.4 (10)

NOTE. All percentages reported are % of n = 292.

*Some women reported problematic pain at specific sites in the past month but had a CPG of 0 for pain severity in past 6 months.

†% (n).

‡Range (0–10): mean (SD).

(χ^2 = 9.83, P = .002). With respect to substance use, no associations were found between disability categories and smoking, street drugs, or potential alcohol dependence.

Regarding health service use in the past month, women with high disability CPGs were more likely than those with low disability CPGs to have visited a family physician (χ^2 = 14.62, P < .001), a psychiatrist (χ^2 = 16.39, P < .001), and/or a ED (χ^2 = 5.26, P = .022). No significant differences were found by disability category for income, age, or education. Women in the high disability category were more likely than those in the low category to be unemployed (χ^2 = 11.36, P = .001) and/or receiving disability pension (χ^2 = 24.67, P < .001), but no more likely to be on social assistance.

Pattern of Medication Use

The average number of prescription medications being taken increased with each pain grade: Pain Grade 0, M = .56 (SD = .89; range, 0–3); Pain Grade I, M = 1.57 (SD = 2.00; range, 0–10); Pain Grade II, M = 1.72 (SD = 1.72; range, 0–8); Pain Grade III, M = 2.76 (SD = 3.15; range, 0–13); Pain Grade IV, M = 3.98 (SD 3.04; range, 0–14). Use of prescription and OTC medications commonly recommended for relief of chronic pain[35] by pain grade is presented in Table 4. Women with high disability CPGs were more likely than those with low disability pain to be taking opioids (χ^2 = 25.22, P < .001), acetaminophen with codeine (χ^2 = 16.15, P < .001), prescription nonsteroidal anti-inflammatory drugs (NSAIDs) (χ^2 = 7.89, P = .005), and antidepressants (χ^2 = 12.77, P < .001) but no more likely to be taking OTC NSAIDs or other analgesics.

Discussion

Over 35% of women in this sample of survivors of IPV experienced high disability chronic pain suggesting a higher prevalence rate of chronic pain than the 18% reported among Canadian women in the Canadian Community Health Survey (CCHS) 1.1.[34] However, the comparability between samples is limited because the CPG[49] captures chronic pain severity through dimensions of intensity and disability over 6 months in comparison to the presence/absence over time single-item measure of chronic pain used in the CCHS, "Are you usually free from pain or discomfort?" However, we can still safely assert that chronic pain is more prevalent in our sample, since the CPG we used is the more explicit measure. These findings extend our understanding of the prevalence of chronic pain associated with IPV[39] by demonstrating its persistence after an average of 20 months of separation from the abusive partner.

Our findings regarding women experiencing pain on average in more than 3 sites extends our knowledge of the multiple locations of pain associated with IPV.[7] A

Table 4. Percentage (n) of Women in Each Pain Grade Taking Selected Medications in Past Month (n = 292)

% (n) of 292	Overall	Grade 0 5.5% (16)	Grade I 37.3% (109)	Grade II 21.9% (64)	Grade III 14.4% (42)	Grade IV 20.9% (61)
Opioids*	7.2% (21)	0	.9% (1)†	3.1% (2)†	11.9% (5)†	21.3% (13)†
Acetaminophen with codeine	8.6% (25)	0	1.8% (2)†	7.8% (5)†	7.1% (3)†	24.6% (15)†
Prescription NSAIDs:	10.6% (31)	0	5.5% (6)†	10.9% (7)†	19% (8)†	16.4% (10)†
Antidepressants	31.5% (92)	0	21.1% (23)†	35.9% (23)†	35.7% (15)†	50.8% (31)†
Gabapentin	2.1% (6)	0	0	1.6% (1)†	7.1% (3)†	3.3% (2)†
OTC Analgesics‡	42.1% (123)	18.8% (3)†	39.4% (43)†	48.4% (31)†	45.2% (19)†	44.3% (27)†
OTC NSAIDs§	39% (114)	18.8% (3)†	37.6% (41)†	46.9% (30)†	40.5% (17)†	37.7% (23)†

Abbreviations: NSAIDs, nonsteroidal anti-inflammatory drugs; OTC, over-the-counter.

*Opioids include codeine phosphate, meperidine hydrochloride, morphine sulphate, oxycodone, pentazocine, and percocet.

†% within pain grade.

‡OTC analgesics include acetaminophen and aspirin.

§OTC NSAIDs refer to ibuprophen.

striking finding in this study is the prevalence (43.2%) of swollen/painful joints. The mean age of women with swollen/painful joints was significantly higher (M = 41.35, SD = 9.39) than for those without (M = 37.37, SD = 10.01, t (285) = −3.43, P = .001), suggesting that aging may be a factor. The frequency and reported high degree of interference in daily life associated with such pain suggests that treatment may not be providing adequate relief. Swollen/painful joints have not previously been identified in samples of women with IPV history. Further research focusing on IPV and chronic pain from swollen/painful joints is essential to understand the etiologic contribution of a history of IPV and other violence, the associated clinical diagnoses, and the effects on women's lives over time as they age. In contrast, the association between pelvic pain and IPV has been noted in several studies.[6,11] In comparison to 40% or more of women reporting pain in other sites, only 17.5% of women in this study reported pelvic/vaginal pain, a rate consistent with that found in other studies.[6,12] However, our findings suggest that attention to pelvic/vaginal pain is important due to the unique pattern of such pain. In this study, unlike those with pain in other sites, women with pelvic/vaginal pain reported moderate degrees of interference in their daily lives even with low grades of chronic pain, suggesting that regardless of severity, pelvic/vaginal pain is a problem for women.

Our findings provide additional evidence of the link between lifetime abuse history and chronic pain.[39] High disability CPGs were associated with more severe IPV as well as with histories of child abuse and adult sexual assault. No association was found between ongoing abuse by the ex-partner since leaving and CPG categories. This difference in associations between CPG categories and current versus past abuse may be related to the differences in physiological responses to current acute stressors versus chronic stressors.[18] In acute stress, the hypothalamic-pituitary-adrenal (HPA) axis is activated, stimulating the release of cortisol from the adrenal cortex and leading to a reduction in pain and inflammation.[15] Chronic stress, particularly that stemming from traumatic events, may lead to imbalance in the body's adaptive stress response and dysregulation of both cortisol levels and proinflammatory cytokines[33] that may lead to an increase in the autoimmune/inflammatory response and, subsequently, chronic pain.[53]

The association between any abuse-related injury and high disability pain supports previous findings that IPV-related injury increases the odds of chronic pain.[13] Inadequately treated acute pain may lead to chronic inflammatory pain,[8,10] particularly in the context of other stressors.[9] Because fewer than 50% of women seek health care for IPV-related injuries,[24] abused women may be at increased risk for chronic pain. Because IPV typically involves repeated trauma, women may be subject to additional injuries before previous injuries have healed as well as to the emotional stress of abuse, further increasing their vulnerability. Although abused women use the health care system as frequently as other women, guidelines to facilitate clinical assessment of violence victimization in women are lacking or not routinely implemented.[40] Our finding that women with high disability pain were more likely to have visited the ED for abuse-related injury is difficult to explain and suggests the need for further research. In particular, examination of relationships between chronic pain severity and the seriousness and location of abuse-related injuries treated in the ED, and the appropriateness of treatment and follow-up is warranted.

Our finding that higher disability pain grades were associated with symptoms consistent with PTSD adds to the dialogue regarding the relationships among abuse, PTSD, and chronic pain. PTSD associated with chronic pain leads to more intense pain and distress, higher levels of interference and more disability.[36] Neurobiological changes associated with PTSD lead to an increased inflammatory response consistent with chronic pain.[53] As well, chronic pain may be exacerbated by PTSD due to catastrophic interpretations of pain symptoms, elevated anxiety levels, and intrusive distress that interferes with the cognitive capacity needed to manage such pain.[3] Although 51.6% of our sample had symptoms consistent

with DSM-IV diagnostic criteria for PTSD as measured by the DTS, only 7.1% reported a formal diagnosis of PTSD by a health care provider.[54] Thus, identification and treatment of PTSD symptoms is an important aspect of management of chronic pain in women with a history of IPV. In this sample, 55.8% of women in the previous month had made visits to a family doctor, 13.4% to a psychiatrist, and 11.6% to an ED, suggesting that opportunities for diagnosis and management of PTSD existed. These findings raise questions about whether adequate attention is paid to abuse history and/or symptoms of PTSD in women with chronic pain.

Our finding that there was no association between levels of chronic pain disability and smoking, use of street drugs, or potential for alcohol dependence suggests that these behaviors are not used as coping strategies for high disability chronic pain by women in our sample. However, given the high rates of smoking and potential for alcohol dependence in this sample, these behaviors may be used to deal with other intrusive stressors that women face after leaving, such as lack of income, housing, and day care, visitation and custody disputes, or the intrusive symptoms of PTSD.[19] The association between high disability pain and using medication in more than the recommended dosage suggests that some women do not get relief from their medications. In a recent European survey of 4,839 people with moderate to severe chronic pain, 40% of the two-thirds taking prescription medications reported inadequate management of symptoms.[2] Further research exploring the effectiveness of medications as well as non pharmacological treatments such as cognitive-behavioral therapy or physiotherapy in the management of chronic pain in IPV survivors is needed.

Other factors associated with high disability pain included depressive symptoms, memory loss, difficulty sleeping, fatigue, and having ever attempted suicide, indicating that women survivors of IPV with high disability chronic pain are experiencing a range of mental health symptoms. Although the association between fatigue or sleep difficulties and chronic pain in abused women is established[14,28] and sleep problems are prevalent in women living in shelters,[23] our findings demonstrate that difficulty sleeping associated with chronic pain persists for at least 20 months after leaving. Given that 30.8% of women in this sample had ever attempted suicide, suicide assessment is an important aspect of clinical intervention for women with chronic pain who have left abusive partners. These findings highlight the need for increased clinical attention to symptom management beyond pharmaceutical solutions.

In contrast to findings of studies about chronic pain in general populations,[44,48] age, education, and income were not associated with high disability pain in this study. Given the mean age of women in the sample was 39.4, further research is needed to understand the effect of getting older on chronic pain levels in survivors of IPV. More than half of women in this study were unemployed, and unemployment was associated with high disability pain, suggesting that chronic pain may interfere with women's ability to maintain employment regardless of their age or education. Given that more than half of these women were parenting dependent children, the implications of unemployment and interference with daily life associated with high disability pain are relevant not only to the welfare of the women themselves but also to the well-being of their children. A better understanding of the course of pain disability and its implications across the lifespan for women who have left abusive partners is needed.

Less than 25% of women with high disability pain were taking opioids, Tylenol with codeine, prescription NSAIDs, or gabapentin, the medications usually prescribed to patients with chronic pain.[35] Women with high disability pain were more likely than those with low disability pain to be taking such medications. Despite the prevalence of high disability pain in this sample, the percentage of women taking opioids in the past month is equivalent to that of women of similar age in the general Canadian population.[54] Further, in a Canadian survey, use of pain medication, tranquilizers, antidepressants, and opioids was 2 to 4 times higher among those with chronic pain than those without.[34] Although high disability pain was not associated with the use of OTC analgesics or NSAIDs in the present study, approximately 40% of these women had taken each of these medications in the past month. These findings combined with the rates of unemployment and PTSD symptoms raise questions about how well chronic pain is being managed in this population.

One limitation of this study relates to the retrospective measurement of some variables, particularly chronic pain, and the resulting risk of recall bias. However, most self-report measures used relatively short periods of time (ie, past month or past week) to facilitate recall and limit recall bias. There is also evidence to suggest that recalled pain over a 1 week period is as valid as electronic measurement of momentary pain.[25] Although prospective longitudinal assessments of chronic pain would be preferred, an analysis of cross-sectional retrospective data is a reasonable, albeit imperfect, method of providing an initial description of the pattern of chronic pain in women who have experienced IPV. Another limitation of this profile is that it relies exclusively on bivariate tests of association using cross-sectional data. As such, we make no claim of causal associations between the study variables. To fully understand the predictors and covariates of chronic pain among women who have been abused, further multivariate analysis is necessary. Exploration of how types (physical, sexual, psychological), timing (child, adult), and number of abuse experiences affect chronic pain grade and pain location is necessary. Further investigation of the relationships among abuse, mental health problems (symptoms of PTSD and depression) and chronic pain grade and location would assist in advancing current knowledge of chronic pain in women with abuse histories.

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