



ELSEVIER

Women's Health Issues 16 (2006) 252–261

WOMEN'S  
HEALTH ISSUES

## LONG-TERM COSTS OF INTIMATE PARTNER VIOLENCE IN A SAMPLE OF FEMALE HMO ENROLLEES

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Received 2 December 2005; accepted 16 June 2006

**Objectives.** To compare costs associated with intimate partner violence (IPV) overall and for selected physical health problems in a nonpoor, privately insured sample.

**Methods.** We compared 185 women aged 21–55 who were physically and/or sexually abused between 1989 and 1997 and enrolled in a multisite metropolitan health maintenance organization (HMO) to 198 never abused women enrolled in the same plan who had been matched using propensity score stratification. Costs associated with HMO visits, hospital stays, referrals, and emergency room (ER) visits, prescriptions, and radiology are based on the Medicare Resource-Based Relative Value System, expressed in 2005 dollars.

**Results.** Average health care costs for women who reported physical, sexual, and/or emotional abuse exceeded those of never abused women by \$1,700 over the 3-year study period. Women who reported abuse within 12 months of interview had higher average costs, as did women who reported physical abuse; however, sexual or emotional abuse and previous abuse also elevated costs. Costs associated with neurologic symptoms, injuries, mental health care, and unclassified symptoms account for most of these differences.

**Conclusions.** IPV elevates health care costs, not only among women currently experiencing abuse, but also among women for whom the abuse has ceased. Efforts to control health care costs should focus on early detection and prevention of IPV.

### Introduction and Background

The United States Bureau of Justice Statistics reported that nearly 600,000 women were raped, sexually assaulted, robbed, or assaulted by an intimate in 2001. The National Center for Injury Prevention and Control at the United States Centers for Disease Control estimates that intimate partner violence (IPV) costs \$5.8 billion dollars annually (National Center for Injury Prevention and Control, 2003). The bulk of

these costs (\$4.1 billion) are related to health care. A recent study using the same data as presented here found that abused women have a 50–70% increase in gynecologic (GYN), neurologic (CNS), and stress-related problems with women both sexually and physically abused most likely to report problems (Campbell et al., 2003). The present study builds on the previous by quantifying the health care costs that accompany these associated health problems. It investigates differences in the costs of physical versus sexual intimate partner abuse as well as ways in which costs vary with the timing of the abuse. The differences in costs found in this sample of predominantly middle class, working women indicates that higher social class and improved economic conditions do not

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appear to mitigate the higher health care costs of domestic violence reported elsewhere in samples of primarily lower income women.

Domestic violence is a significant risk factor for a variety of physical health problems frequently encountered in primary care settings, including injuries to the face, neck, upper torso, breast or abdomen (Mullerman, Lenaghan, & Pakieser, 1996); pain or discomfort from recurring central nervous system symptoms such as headaches, back pain, fainting, or seizures (Cascardi, Langhinrichsen, & Vivian, 1992; Coker, Smith, Bethea, King, & McKeown, 2000; Diaz-Olavarrieta, Campbell, Garcia de la Cadena, Paz, & Villa, 1999; Karol, Micka, & Kuskowski, 1992; Leserman, Li, Drossman, & Hu, 1998; McCauley et al., 1995; Plichta, 1996; Rapkin, Kames, Darke, Stamppler, & Naliboff, 1990; Toomey, Hernandez, Gittleman, & Hulka, 1993; Zachariades, Koumoura, & Konsolaki-Agouridaki, 1990); signs, symptoms, and illnesses associated with chronic fear and stress such as functional gastrointestinal disorders and appetite loss (Coker et al., 2000; Drossman, Talley, Leserman, Olden, & Barreiro, 1995; Leserman et al., 1998; McCauley et al., 1995); viral infections such as colds and flu (Kerouac, Taggart, Lescop, & Fortin, 1986; Leserman et al., 1998; Letourneau, Holmes, & Chasedunn-Roark, 1999); cardiac problems such as hypertension and chest pain (Coker et al., 2000; Koss & Heslet, 1992; Letourneau et al., 1999); and GYN symptoms such as sexually transmitted diseases, vaginal bleeding or infection, fibroids, pelvic pain, and urinary tract infections, all of which are also associated with sexual abuse (Coker et al., 2000; Eby, Campbell, Sullivan, & Davidson, 1995; Leserman et al., 1998; Letourneau et al., 1999; McCauley et al., 1995; Plichta, 1996; Plichta & Abraham, 1996; Schei, 1991; Schei & Bakketeg, 1989). Forty to forty-five percent of women who are physically abused by their intimate partners are also forced into unwanted sexual activities. Another, smaller percentage are sexually abused by their intimate partner, but not physically abused (Campbell, 1989; Campbell & Soeken, 1999 Tjaden & Thoennes, 2000). Sexual assault could explain the high prevalence of GYN problems reported by battered women. However, none of the studies measured forced sex separately.

Previous research on costs has found a roughly 2-fold increase in costs and use of services among female HMO enrollees with medical record indicators of IPV (Glass, Dearwater, & Campbell, 2001; Ulrich et al., 2003). Wisner, Gilmer, Saltzman, and Zink (1999) found a similar elevation in costs, which translated into an annual difference of \$1,775. Most of this was attributable to higher rates of hospitalization, higher general clinic use, use of mental health services, and out-of-plan referrals, all contemporaneous costs. Another study that assessed costs of health services use among battered women found that these costs aver-

aged \$1,633 per patient per year among currently battered women. This translates to an estimated national cost of \$857 million (Meyer, 2002). None of these studies examined costs associated with IPV that specifically involved sexual assault and only 2 examined costs over more than the current year. It has also been speculated that higher health care costs among IPV victims may be related to unnecessary tests and referrals to specialists when physicians fail to ask about IPV as the root cause of the presenting complaint (Varjavand, Cohen, & Novack, 2002).

We examine herein health care costs associated with 2 groups of female HMO enrollees over a 3-year interval: those who have ever been abused and those who report no abuse in their lifetime. Our objective is to determine whether or not IPV victims in this relatively well-educated and well-insured sample demonstrate higher health care costs than women with no history of IPV and whether or not this difference persists over time.

## Methods

### *Sample*

The sample is drawn from females enrolled in a metropolitan Washington DC-area HMO. It represents a racially balanced and relatively well-educated group of middle class, working women. After Institutional Review Board approval from the university and HMO at the national and regional levels, letters of invitation were mailed to 21,426 women between the ages of 21 and 55 who were continuously enrolled from 1995–1997. For safety reasons, letters (mailed in 1997 and 1998) did not mention abuse. They asked women to participate in a women's health survey. Twelve percent (2,535) responded indicating a time and telephone number where they could be reached for a private interview.

A professional survey company, whose interviewers were trained by the investigators, was employed to conduct all interviews. At telephone contact, the interviewer described the nature of the study and obtained verbal consent. Four hundred forty-seven women (17.6%) could not be located, 7 (0.3%) were ineligible owing to no longer being enrolled in the HMO, and 76 (3.0%) refused to participate, yielding a sample of 2,005 women (79.1% of initial respondents). Demographic information about eligible women who did not participate was not available from the HMO. Consequently, no comparisons between the sample and the larger population can be made.

### *Identification of abused and never abused women*

A modified version of the Abuse Assessment Screen (Soeken, McFarlane, Parker, & Lominack, 1998) was administered to all 2,005 women. IPV was defined as

physical and/or sexual assault by a husband, partner, ex-husband, or ex-partner (Campbell & Humphreys, 1993). Three questions were used to identify women who had experienced IPV: Have you ever as an adult been physically abused by a husband, boyfriend, or female partner? Have you ever been hit, slapped, kicked, pushed or shoved, or otherwise physically hurt by a current or previous husband, boyfriend, or female partner? Have you ever been forced into sexual activities by a husband, boyfriend, or female partner? Two hundred one women (abused) responded, “yes” to  $\geq 1$  of these questions and indicated that the abuse occurred between 1989 and 1997. The restriction on time period for abuse was chosen to allow for development of health consequences without substantially interfering with the woman’s ability to recall severity or other descriptive characteristics. These women participated in a longer, in-depth interview about their history of abuse.

A random sample of 240 women (never abused) was drawn from those who reported having been in an intimate relationship and never having experienced abuse. These women were administered the same in-depth interview. Respondents to the longer interview received \$15 compensation for their time. A protocol derived from Holly Johnson’s Canadian domestic violence telephone survey safety protocol was used (Johnson & Sacco, 1995).

#### Cost data

Health care costs associated with each woman were obtained from the HMO. Because the HMO does not bill members for services, cost figures obtained were those used by the HMO to bill nonmembers. They are based on the Medicare Resource-Based Relative Value System (RBRVS) full fee for the metropolitan area in which the HMO is located and reflect the CPT4 code associated with the visit. Costs were assigned to each health care encounter by the HMO at our request. They were originally expressed in calendar year 1999 dollars, reflecting the year in which costs were assigned. These were inflated using an inflation rate of 32% calculated for the period 1999–2005 from the US Department of Labor, Bureau of Labor Statistics All Urban-Consumers Consumer Price Index for medical services (available: [www.bls.gov](http://www.bls.gov)). Data were available from 1995 through 1997 for 5 services: 1) HMO visits; 2) hospital stays; 3) out-of-Plan referrals, including emergency room (ER) visits; 4) prescriptions; and 5) radiology.<sup>1</sup> HMO visits include physician office visits, clinic visits to nonphysician providers, follow-up sur-

gical visits, and “educational” visits provided by the HMO.

Data on a total of 11,029 encounters were provided to us. Of these, 9,680 had up to 5 different ICD-9CM codes associated with each encounter. Missing ICD-9 codes occurred for infrequently occurring diagnoses that were not on the HMO’s preprinted list of common diagnoses. When a diagnosis is not on the list, physicians are supposed to write in the diagnosis and check a box indicating a need for later coding. According to HMO personnel, the check is often missing, leading to missing coding. In addition, 236 HMO visits had zeros coded for costs. Conversations with HMO personnel indicated that these were most likely legitimate zeros associated with follow-up surgical visits and “educational” visits, for which the RBRVS cost was zero.

Based on up to 5 possible ICD-9 codes for each encounter, each encounter was classified as 1) CNS only; 2) GYN only; 3) stress only; 4) CNS/GYN and/or stress; 4) any injury; 6) any mental health condition; and 7) all other not elsewhere classified (NEC).<sup>2</sup> These mutually exclusive categories were chosen to reflect symptom clusters that previous research had identified as common among IPV victims.

#### Statistical analysis

Previous research with this sample (Campbell et al., 2002; Jones et al., 1999) indicated that the 2 abuse groups differed significantly on a number of demographic characteristics. Several of these characteristics, such as race, income, and education, may also influence health outcomes and costs. Consequently, these differences could produce biased estimates of cost differences attributable to IPV (Heckman, Ichimura, & Todd, 1997). To reduce bias, we employed propensity score (PS) matching (Rosenbaum & Rubin, 1983, 1984, 1985), which has been demonstrated to reduce bias in observational studies (Diaz & Handa, 2006; Dehejia, 2005; Dehejia & Wahba, 1999; Smith & Todd, 2001). This method has been used in similar applications where individuals cannot be randomized to the behavior of interest (Jones, D’Agostino, Gondolf, & Heckert, 2004; Jones & Richmond, 2006).

The PSCORE do-file in the STATA statistical software package was used to estimate the propensity to have been physically or sexually abused in this sample ( $n = 415$  observations with nonmissing covariates). Variables included in the PS regression are listed in Table 1. A likelihood ratio test indicated that this model had significantly better explanatory power than the null ( $\chi^2_{(24 \text{ df})} = 121.0; p \leq .0001$ ).

A PS was predicted for each woman and PS distributions were compared for abused versus not-abused

<sup>1</sup>Cost data for radiology visits were not available for the first 6 months of 1995. Data on laboratory costs were not available for any of the years.

<sup>2</sup>Details of ICD-9 mapping to symptom categories are available from the authors on request.

**Table 1.** Sociodemographic characteristics of abused and never abused women after propensity score matching, observations with common support only

	Abused N = 185	Not Abused N = 198
Age	40.4 (8.5)	40.3 (8.2)
Ethnicity		
African American	52.4%	44.9%
White	41.1%	49.0%
Other	6.4%	5.0%
Marital Status		
Married*	38.4%	47.5%
Separated/Divorced*	23.8%	16.7%
Widowed****	16.2%	3.0%
Single***	21.6%	32.8%
Education		
<High School	2.7%	2.0%
High School Graduate**	26.0%	17.2%
Some College	35.1%	30.8%
College Graduate*	22.7%	31.3%
Post Graduate	13.5%	18.7%
Household Income		
< \$30,000	20.5%	16.1%
\$30,000–\$49,999	35.1%	30.3%
\$50,000–\$79,999	24.9%	27.3%
> \$80,000**	16.2%	25.2%
Self-Reported Health Status		
Excellent*	21.6%	28.8%
Very Good	39.4%	43.9%
Good, Fair, Poor**	38.9%	27.3%
Employed Full-Time***	85.9%	78.3%
Percent of Household Income from Respondent	71.6%	65.1%
Number of Children*	1.1 (1.2)	0.90 1.1
Respondent CAGE Score****	0.6 (1.1)	0.2 (0.6)
Respondent Smokes****	23.9%	10.0%
Partner Employed Full-Time	77.3%	85.3%
Partner's Weekly Alcohol Intake		
Never	19.4%	25.8%
<5 Days****	44.3%	60.1%
≥5 Days****	36.2%	14.1%
Respondent's Education > Partner's Education****	36.8%	14.4%

\* $p \leq .10$ ; \*\* $p \leq .05$ ; \*\*\* $p \leq .01$ ; \*\*\*\* $p \leq .001$  (two-sided test) (Standard Deviation).

women. Women whose PSs do not match those in a comparison group have characteristics that are so different from anyone in the other group that they cannot be controlled for in ANCOVA or other types of analyses. Consequently, their inclusion would likely bias the estimate of the IPV effect (Rubin & Thomas, 2000). To improve the match between women in the 2 groups and reduce bias, observations whose PS did not fall within the distribution of scores in the other group were excluded. The resulting group of 383 women are said to have “common support” meaning

that they are close matches on observed characteristics.

The PSCORE algorithm also determines the optimal number of groups by which to stratify women based on their PS. This algorithm seeks to reduce bias by choosing the number of strata or blocks within which all regression covariates are balanced. *Balanced* in this case means that the covariates of the 2 groups do not differ significantly from each other within a block. This is similar to what one would expect to find if abuse status could have been randomly assigned. Five blocks were formed based on this algorithm and all covariates were found to be balanced within blocks.

Comparisons of cost differences between matched abused and not-abused women were conducted by calculating a simple overall average cost across blocks for each group and the difference of the overall group averages (Rosenbaum & Rubin, 1984). We also estimated the cost differences between abused and not abused women using nearest neighbor (NN) matching and obtained results that were very similar to those reported in terms of pattern. However, the magnitudes of the cost differences based on the NN algorithm were generally larger, possibly overestimating the impact of IPV on health care costs. Hospital costs and referral costs, which are based on very few observations in both IPV groups, tend to be higher cost services and the distribution of costs is highly skewed, especially for these 2 services. For this reason, hospital costs, referral costs, and overall costs were particularly sensitive to the method used. The NN method appeared to yield cost and cost difference estimates that were more strongly influenced by high cost abused women. (NN results available on request.) We opted for the more conservative estimates provided by the simple block average method because they were based on more statistical information, that is, more observations, than the NN method. This tended to reduce the impact of high cost users in both groups and should improve the reliability of our estimates in light of our relatively small sample size.

Some might argue that in light of the well-known skewness in cost data, median costs should have been used in the results presented. However, from a policy perspective and from the perspective of an insurer or a provider who is concerned with tracking and minimizing costs, it is not the median, but the mean that matters. The mean more accurately reflects the disproportionate impact that a very small proportion of very high cost users can have on overall costs.

## Results

Table 1 presents covariate means by IPV status for the 383 women for whom there was common support after PS matching. As can be seen, without stratifica-

**Table 2.** Propensity score adjusted average costs (2005 Dollars) and difference in average costs by type of service and abuse status

	HMO Visits		Hospital Stays		Referrals		Prescriptions		Radiology	
	Abused	Not Abused	Abused	Not Abused	Abused	Not Abused	Abused	Not Abused	Abused	Not Abused
1995	\$661 (175)	\$593 (191)	\$9,069 (15)	\$5,018 (16)	\$893 (28)	\$951 (35)	\$331 (151)	\$225 (159)	\$261 (100)	\$211 (109)
	\$68 (–\$186 – \$322)		\$4,051 (–\$3,031 – \$11,1332)		–\$59 (–\$568 – \$451)		\$106 (–\$142 – \$353)		\$50 (–\$146 – \$246)	
1996	\$641 (174)	\$552 (192)	\$17,576 (11)	\$8,627 (10)	\$2,039 (31)	\$1,079 (20)	\$394 (147)	\$230 (160)	\$271 (95)	\$209 (92)
	\$89 (\$196 – \$375)		\$8,948 (–\$5,992–\$23,890)		\$959 (–\$587 – \$2,505)		\$164 (–\$197 – \$525)		\$61 (–\$84 – \$207)	
1997	\$640 (175)	\$604 (188)	\$16,719 (16)	\$17,270 (10)	\$1,981 (42)	\$1,498 (28)	\$381 (157)	\$257 (162)	\$321 (114)	\$265 (112)
	\$36 (–\$57 – \$130)		–\$551 (–\$15,766–\$14,664)		\$483 (–\$1,393 – \$2,360)		\$124 (–\$236 – \$484)		\$56 (–\$140 – \$252)	

Note: Average Costs (Cell N). Average Cost Difference (95% C.I. for difference: Abused-Not Abused). \**p* ≤ .10; \*\**p* ≤ .10; \*\*\**p* ≤ .05.

tion into 5 blocks, the 2 groups are quite different on many characteristics that may be associated with lower health status and higher health care costs. In many of these cases, the differences are statistically significant. Note, however, that because the intrablock balancing property was satisfied, these differences are not statistically significant within each of the 5 blocks.

Table 2 shows PS-adjusted average costs by year, abuse status, and type of service. The largest differences between abused and never abused women are in costs associated with hospital stays in 1995 and 1996. Differences range from just over \$4,000 in 1995 to nearly \$9,000 per patient in 1996. Because of sparse blocks and high dispersion in costs, these differences do not achieve statistical significance at conventional levels. In 1997, costs for the 2 groups are not very different, either statistically or practically. This is a case where the NN method yielded an average difference of abused over not abused of almost \$5,000 in 1997. However, it was based on only 4 control matches, reducing its reliability.

Overall, abused women systematically demonstrate higher costs regardless of service type with the exception of referrals in 1995 and hospital stays in 1997. Referral includes ER visits, in 1996 and 1997, which could account for the more similar results in these years. The number of women in each group that was referred outside the plan averages around 60 in any given year. The relatively large difference of almost \$1,000 in 1996 is not statistically significant because of the small number of referrals and the high level of dispersion in these costs.

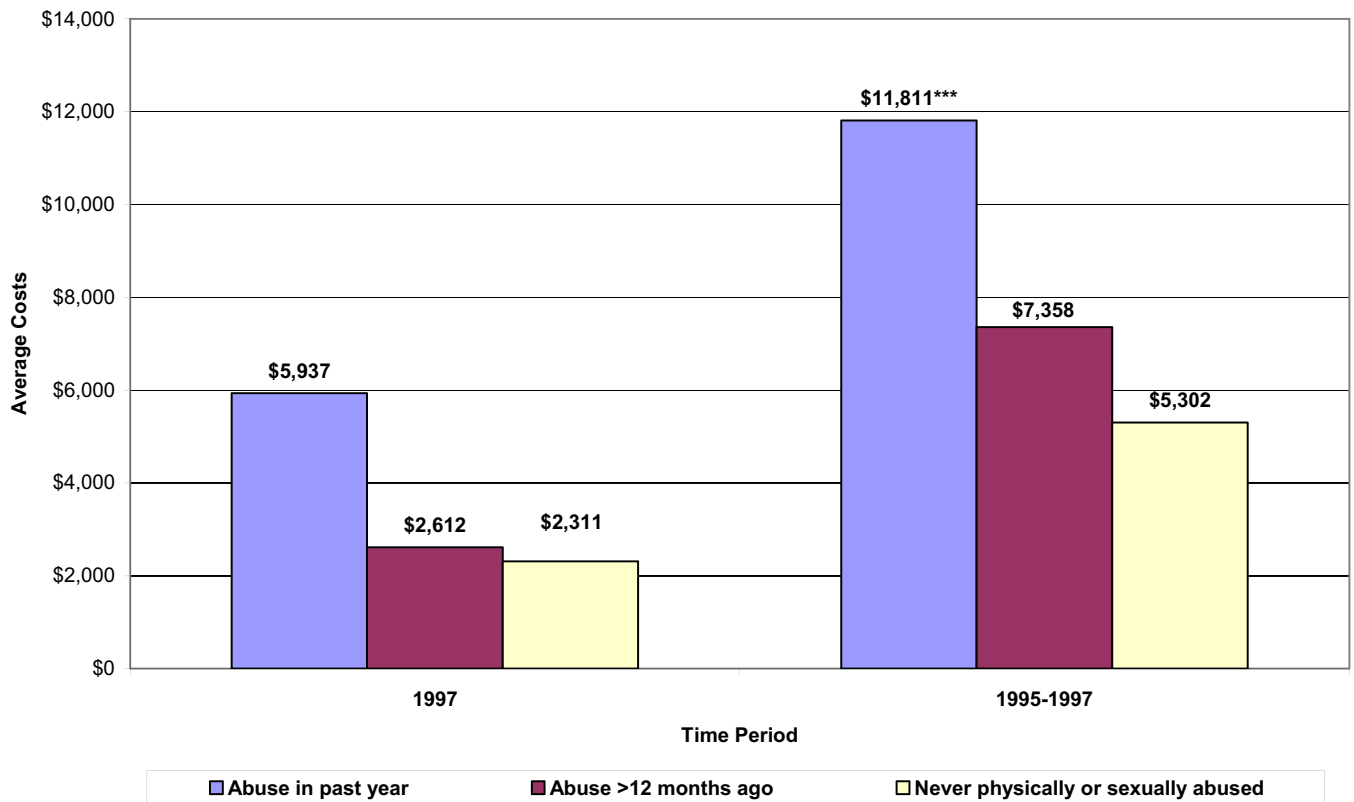
When costs are aggregated across types of services for each year and over all 3 years (Table 3), the consistent pattern is one in which the average health care costs of abused women exceed those of never abused women. Over the 3-year study period, this difference amounts to roughly \$1,700, but is not statistically significant. However, it is almost certainly practically important for insurers if subsequent research with larger samples confirms it.

Figure 1 presents average per patient health care costs by timing of abuse for the final year covered by the survey when the most recent abuse is likely to have occurred and for the entire 3-year period. The largest difference is seen with 3-year costs. Recently abused women have costs that are more than twice those of never abused women (*p* = .004; 1-sided *t*-test) and about \$4,500 higher than women who have not been abused in the past year (*p* = .14; 1-sided *t* test). A similar pattern is seen for costs by timing of abuse in 1997 with costs of women abused in the year prior to interview nearly twice those of their never abused counterparts (*p* ≤ .05; 1-sided *t*-test). However, in this year there is no difference between never abused women and those abused >12 months prior to interview.

Figure 2 presents average per patient costs by type of abuse. Women who report experiencing both physical and emotional abuse had the highest costs in the most recent year of the survey, more than twice those of never abused women (*p* ≤ .05; 1-sided *t*-test). When costs are aggregated over the entire 3-year period, this pattern persists (*p* ≤ .05; 1-sided *t*-test), but women who experience both physical and sexual abuse are

**Table 3.** Average annual and overall propensity score adjusted per patient health care costs (2005 Dollars)

	Abused	Not Abused
1995 Average Health Care Costs (Cell N)	\$1,819 (176)	\$1,335 (194)
Difference (95% Confidence Interval)		\$484 (–\$637–\$1,605)
1996 Average Health Care Costs (Cell N)	\$2,478 (180)	\$1,478 (195)
Difference (95% Confidence Interval)		\$1,000 (–\$714–\$2,714)
1997 Average health Care Costs (Cell N)	\$3,023 (177)	\$2,660 (192)
Difference (95% Confidence Interval)		\$363 (–\$3,506–\$4,233)
Three-Year Average Health Care Costs (Cell N)	\$7,108 (184)	\$5,380 (198)
Difference (95% Confidence Interval)		\$1,727 (–\$3,749–\$7,204)



**Figure 1.** Average health care costs among propensity score matched female HMO enrollees by Timing of abuse (2005 dollars).  $\$p \leq .10$ ;  $*p \leq .10$ ;  $**p \leq .05$ ;  $***p \leq .005$ .

seen to have costs slightly higher than this group. Most interesting, perhaps, are the health care costs of women who experience emotional abuse only. The difference between costs for this group and the never abused group do not differ significantly ( $p = .11$ ; 1-sided  $t$ -test), but the magnitude of this difference (43%) is almost certainly of practical importance in reducing health care costs.

When average per-patient costs for the entire 3-year period are broken down by symptom cluster (Figure 3), health care costs for 5 of the 8 symptom categories are lower for women who have never been abused. The difference is most striking for CNS symptoms and for women who experience some combination of CNS, GYN, and/or stress symptoms. However, injuries and mental health also demonstrate a clear pattern of higher costs for abused women. These differences are all statistically significant and are consistent with previous studies cited above that have found IPV to be positively associated with all of these symptoms.

## Conclusions and Discussion

### Limitations

Two limitations of this study provide direction for future work. One is the absence of information about the women's physical or sexual abuse during child-

hood. Childhood abuse represents a potential confounding factor for later health problems. Silva, McFarlane, Soeken, Parker, and Reel (1997) found that 53% of battered women studied reported a history of physical and/or sexual child abuse and Hulme (1997) found 82% of women with a history of severe child abuse were battered as adults. McCauley, Kern, and Kolodner (1997) found that battered women in their primary care sample who were abused as children had long-term health consequences over and above what could be attributed to IPV.

Another limitation of the present study is the lack of IPV and trauma history over the life course. Like IPV, all traumas a woman experiences will affect her physical health and associated health care costs. Holman, Silver, and Waitzkin (2000) found 10% of 1,456 adults interviewed in a low-income primary care clinic had experienced a traumatic event in the last year and 57% experienced at least 1 event in their lifetime. Studies that examine the relationships among childhood abuse, lifetime trauma, IPV, and physical health problems will provide a better understanding of the relative effects of these factors on patient health.

Another possible caveat is the use of PS matching to reduce bias that would result if abused women are very different from their nonabused counterparts on observed characteristics that determine health and

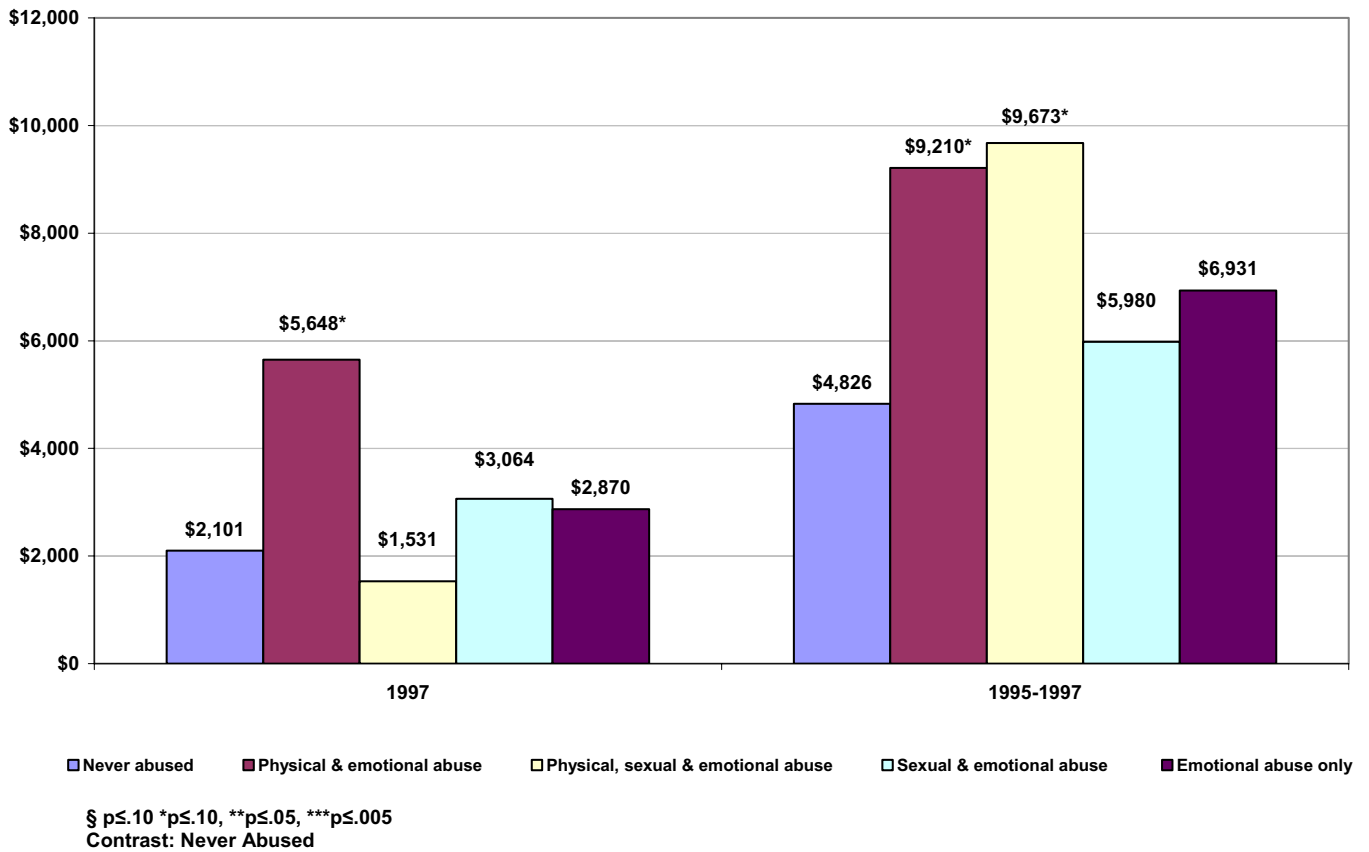


Figure 2. Average health care costs among propensity score matched female HMO enrollees by type of abuse (2005 dollars). §  $p \leq .10$ ; \* $p \leq .10$ ; \*\* $p \leq .05$ ; \*\*\* $p \leq .005$ . Contrast: never abused.

health-related costs. Specification tests have been described (Dehejia, 2005) to test the suitability of this method for a given application. Primary among these is satisfaction of the common support condition, which 383 out of 415 observations from this data set satisfied. Another involves use of alternative PS regression specifications from a different subsample of the same data set so see if results are sensitive to alternative PS specifications. Because the relatively small size of our sample prevented us from investigating subsamples, we employed a slightly different PS specification that coded women who had experienced only emotional abuse as “not abused.” Results from this specification (available from the corresponding author on request) were similar in both patterns and magnitudes of cost estimates with the overall 3-year average cost difference estimated at \$1,500, rather than the \$1,700 reported here. The similarity of these findings supports use of the PS method for this application. It should be noted, however, that PS matching improves estimates, but does not remove bias from differences in unobserved characteristics that influence the outcome of interest.

A significant drawback is the absence of statistically significant differences between the 2 groups in many comparisons. Like all cost data in small samples, costs

were highly dispersed and in some cases comparison groups were small. Power was also reduced by PS matching, which excluded 32 observations to ensure that the 2 groups were comparable on observed characteristics that can influence costs. In the absence of statistical power, there are several indicators that IPV increases health care costs. Regardless of how the data are examined, a consistent pattern of higher costs for abused women is generally observed. Moreover, an alternative specification described resulted in very similar patterns and estimates. If not conclusive, these results are at least consistent with what others have found in samples drawn from women with fewer resources and less education than this sample. They suggest that income, education, and access to care do not protect abused women from the negative health sequelae of abuse and the associated higher costs.

The difference of \$1,700 in overall costs seems small, but has important cost implications. An insurer with, say, 300,000 adult female enrollees could expect roughly 38% to have been abused at some time in their lives (Jones et al., 1999). This would translate into almost \$2 million (2005 dollars) in additional claims over a 3-year period. Similarly, the much higher costs for women who were abused in the 12 months prior to the interview, for that same insurer, would also mean

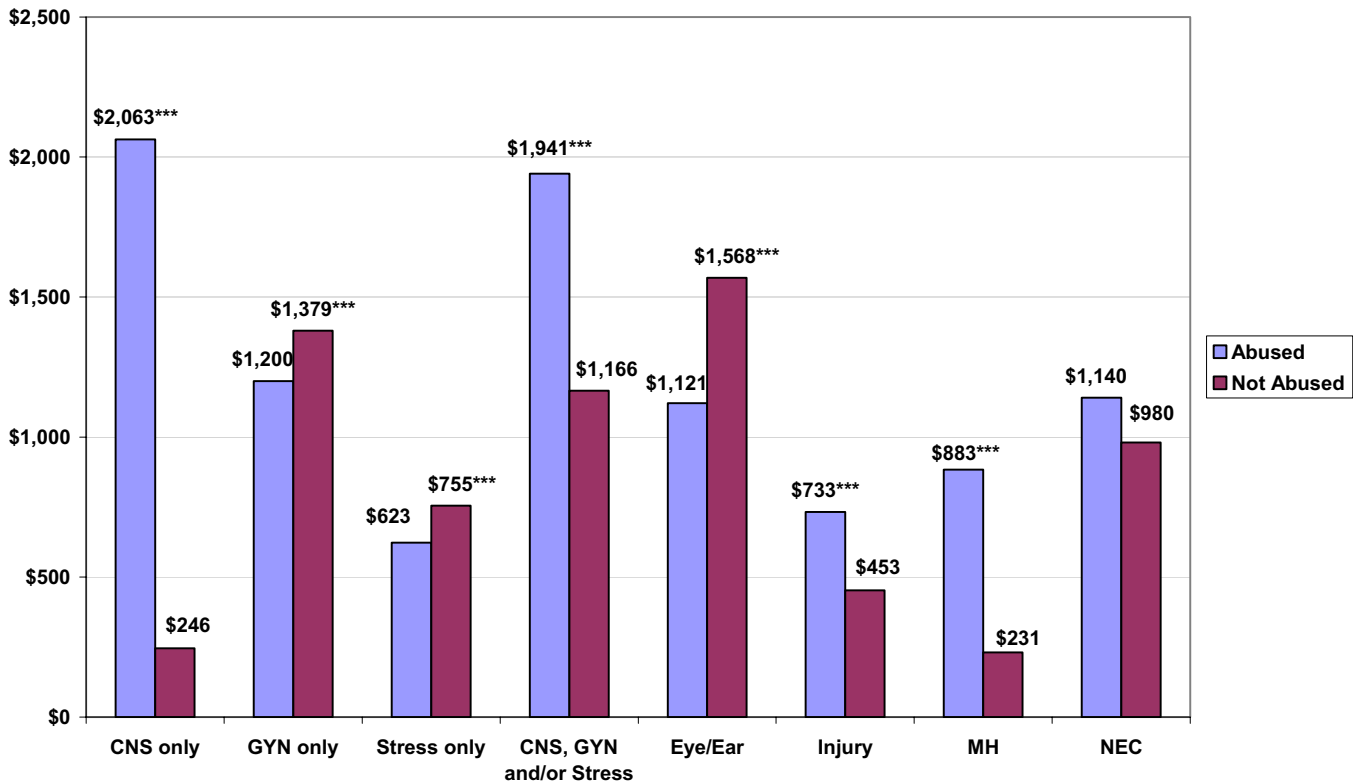


Figure 3. Average health care costs by symptom cluster and abuse status among propensity score matched female HMO enrollees, 1995–1997 (2005 dollars).  $\$p \leq .10$ ;  $*p \leq .10$ ;  $**p \leq .05$ ;  $***p \leq .005$ .

an increase of about \$2 million in claims paid (assuming that 5% of beneficiaries are currently abused).

When timing of abuse and type of abuse, including sexual abuse, are examined, those who report no history of physical or sexual abuse tend to have lower health care costs in almost every comparison. The highest costs were seen among women abused within 12 months of interview, but all women who experienced abuse appear to have higher costs than women who have not. Cost differences are greater when costs are aggregated over time, indicating that the impact of IPV on health care costs is cumulative and persists at least beyond the year in which the abuse occurred. Consistent with previous research, symptom clusters involving CNS, a combination of CNS, GYN, and/or stress conditions, injuries, and mental health appear to account for most of these cost differences.

Physicians and other primary care providers are becoming more aware of the importance of IPV screening and the immediate health problems associated with abuse. They now need to expand this awareness to those that persist or develop over time as sequelae of the abuse. Clearly, the failure to do so has implications for treatment with important cost implications for insurers and the women themselves if the root cause is not identified and appropriate interventions provided.

### Acknowledgements

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This research was supported by U.S. Army Research Materiel and Command (USAMRMC), DAMD 17-96-1-631/RCS DD-HA(OT)2068 (PI-J. Campbell) and an intramural grant from Wake Forest University Women's Health Center of Excellence for Research, Leadership and Education.

The authors thank Stephanie Poe, MScN, RN, Coordinator of Nursing Clinical Quality at The Johns Hopkins Hospital Department of Nursing for invaluable assistance in mapping ICD-9 codes to symptom categories. We also wish to thank Richard Hopley, Research Associate, and David Richmond, Research Assistant, both of Wake Forest University School of Medicine for excellent programming and data analysis and 2 anonymous reviewers for suggestions that substantially improved the analysis. We are extremely grateful to Ms. Deborah Conley for her excellent assistance in obtaining cost figures for HMO encounters. Any errors are the authors' own.

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