Research Article

Emergency Department Visits and Injury Hospitalizations for Female and Male Victims and Perpetrators of Intimate Partner Violence

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Introduction. The potential for hospital-based interventions for male victims of intimate partner violence (IPV) as well as adult perpetrators of both genders has been largely unexplored despite early evidence of acute-care utilization that may be as high as female victims. The current investigation compared the emergency department (ED) and injury-related-hospitalization rates of IPV-involved individuals against standardized national norms, assessing differences by gender and victim/perpetrator-status. **Methods.** This cross-sectional study collected one-year ED and in-patient visit data from hospital records for individuals listed as victim or perpetrator in an IPV criminal charging request in a Midwestern county ($N = 2,937$). Expected rates were calculated based upon age-adjusted national norms. **Results.** The IPV-involved population generated ED rates 4.1 times higher than expected and injury-related-hospitalization rates that were 4.0 times higher than expected. Bi-directionally-violent individuals (both victim and perpetrator in IPV charges) consistently had the highest utilization rates (ED 8.4 RR, injury-hospitalization 22.5 RR). Victims, primarily female, had higher ED-visits than perpetrators, primarily male (victims = 4.6 RR, perpetrator = 3.1 RR). Perpetrators, though, had higher injury hospitalizations (victims = 0.8RR, perpetrators = 5.5 RR). **Conclusions.** Substantial opportunities exist within acute-care medical settings to intervene with IPV-involved women, men, victims, and perpetrators, although the magnitude of the opportunity varied by setting, gender and victim/perpetrator-status.

1. Introduction

The presence of female intimate partner violence (IPV) victims within healthcare settings and the ability of trained, supported providers to detect them have been well documented [1–3]. Healthcare identification, in turn, has the potential to link victims to community services through referrals to shelters, victim advocates, legal services, and counseling [4–6]. Such services have been shown to improve psychological

health and social support and, in the case of postshelter advocacy and perinatal home visitation, to reduce violence [7–10]. However, much of the hospital-based research to date has focused upon universal screening in emergency departments, with little evidence that this has translated to service uptake, greater safety, or subsequent well-being [11–16]. Studies have reported that the logistical constraints common to emergency departments present significant barriers to effective screening [17–20]. IPV interventions that target

hospitalized rather than ambulatory-care patients may hold more promise given their greater time, space, and privacy, yet the possible yield from expanding the existing hospital-based violence-prevention lens has remained largely unexplored.

Similarly, male victims and IPV perpetrators of either gender have, to date, received scant attention within the healthcare field [21–23]. The near-exclusive focus upon female victims has been motivated by the higher rates of injury and long-term morbidity from IPV assaults that are consistently recorded for female victims [24–29]. Reports that male victims' and perpetrators' healthcare utilization may be as high as female victims [30–33], however, coupled with the growing efficacy of therapeutic interventions targeting male perpetrators [34–39], point to the potential of healthcare-based IPV interventions targeting these populations. Further, studies have observed that female victims' own use of aggression may be associated with greater violence and injury [40, 41], a feature that has not been explicitly integrated into injury prevention programs [42].

In a systematic examination of medical care utilization that crosses victim/perpetrator status and gender lines as well as acute care settings, the current investigation examined the relative potential for identification and intervention from the emergency department and medical-surgical settings for all IPV-involved individuals: women, men, victims, and perpetrators. Specifically, the objectives of this paper were as follows:

- (1) To compare actual rates of emergency department visits and injury-related hospitalizations by IPV-involved individuals against expected, nationally normed rates.
- (2) To determine the variation in volume and rates associated with gender and victim/perpetrator status regarding emergency department visits and injury-related hospitalizations.

2. Methods

This study utilized an observational, cross-sectional design to determine the actual and expected rates of ED visits and injury-related hospitalizations by IPV-involved individuals in Kalamazoo County, Michigan, occurring in the year 2010. Actual visit rates were calculated using national visit-standardization algorithms [43, 44]. Data collection, completed in 2012–2013, involved exporting hospital and prosecutor datasets from administrative records. Permission to access data was provided by Michigan Department of Community Health and Kalamazoo County Michigan Office of the Prosecuting Attorney. Institutional Review Board approval and HIPAA exemption were provided by the Michigan Department of Community Health, Borgess Medical Center, and Bronson Methodist Hospital.

2.1. Study Sample. The study population consisted of the 2,937 individuals who were named as a victim or a perpetrator, an IPV-related criminal charging request submitted to Kalamazoo County Prosecutor's Office in 2010. As depicted in Figure 1, the 1,807 charging request incidents (assault and

nonassault) where the victim and the perpetrator had an intimate relationship (current or former spouse, dating partner, homosexual partner, or a child in common) were exported from the Kalamazoo County Prosecuting Attorney's Office. First, all perpetrator and victim names that were listed in the charging requests were extracted, totaling 3,614 names (two for each incident). Then, duplicates, a product of individuals being involved in multiple charging requests, were removed. The only exclusion criterion was perpetrator of age 17 or under. Individuals were categorized into three types based upon the nature of their involvement in study charging requests: victim only, perpetrator only, or bidirectional (the individual was named as both a victim and a perpetrator in one or more charging requests).

The study site, Kalamazoo County, is located in southwest Michigan, with a 2010 population of 250,331 [45], and is comparable to the nation regarding poverty level (22.1% versus 25.6%, US) [46], crime rate (428.2 violent crimes per 100,000 residents versus 410.9, US) [47], and acute care capacity (2.3 acute care hospital beds per 1,000 residents versus 2.4, US) [48, 49] but with fewer minority residents (18.3% versus 27.6%, US) and fewer family-type households (59.9% versus 66.4%, US) [45]. In 2010, Kalamazoo County housed two Trauma I Centers, one at Borgess Medical Center and one at Bronson Methodist Hospital, which, together, served a nine-county region in southwest Michigan.

2.2. Data Collection. Study data consisted of administrative records exported from three sources: crime data from Kalamazoo County MI Prosecuting Attorney's Office and hospital data from Borgess Medical Center and Bronson Methodist Hospital, both Trauma I Centers. Crime data collection, in addition to producing the study sample described above, included demographic variables (gender, race, and age), victim-perpetrator relationship variables, and criminal incident descriptors (charge, whether drugs or alcohol was noted as contributing factors to the incident, the charge disposition, and victim injury (minor, defined as scratches or bruises, and major, such as broken bones, loss of consciousness, and internal injury)). It is worth noting that, as noncritical and often nonavailable data fields within the prosecutor's administrative records system, there was a substantial amount of missing information for the injury, drug/alcohol, and prior history of IPV variables.

Hospital data was produced by the Health Information Management departments within each of the two study hospitals. The Health Information Management departments exported records for all individuals who were emergency department patients in 2010, aged twelve or more. Study investigators compiled these records into a single dataset of 89,500 individuals. As shown in Figure 1, a linking process was then conducted to identify individuals who appeared in both the IPV-crime population and the ED population. ED patients, stratified into IPV-crime-involved and non-IPV-crime-involved, and their associated 2010 ED visits formed the basis for study prevalence and incidence and standardized visit rates. Additional hospital variables included whether the visit was injury-related or not (as defined by diagnosis ICD-9 codes 800–959.9) and whether the ED visit led to an injury-related hospital admission or not.

FIGURE 1: Flow chart of study sample, linkage, and stratified emergency department groups.

2.2.1. Linkage Procedures. Data matching was completed with LinkPlus, a software program developed by the US Centers for Disease Control and Prevention that utilizes probabilistic record linkage for matching alphanumeric identifiers across datasets. For the study, person-level matching was conducted using first name, last name, and date of birth. In order to determine the most effective parameters for the probabilistic algorithm and to assess the quality of the final electronic linkage, the following steps were completed:

- (1) A gold-standard-match dataset was created by manually abstracting emergency department records directly from hospital electronic records systems for a subset of the IPV-crime population (200 randomly selected individuals).
- (2) Multiple iterations of the crime/hospital linkage were performed, using various algorithm values, until a linked dataset was produced that contained the greatest number of gold-standard records. These algorithm parameters were then adopted for the full, final linkage.
- (3) To assess linkage quality, LinkPlus was run, using the adopted parameters, with the 200-person subset, and the results were compared against the gold-standard-match. Results showed (a) there were no false-positive matches and (b) there were 9.3% false-negatives. In other words, 90.7% of the time, ED records associated with an IPV-involved study participant were accurately captured using the study linkage procedures.

Within linked individuals, event-level matching was based upon incident-date variables in the crime and hospital datasets (e.g., date of crime and date of ED visit) and was conducted using SPSSv.20.

2.2.2. Measures and Rate Calculations. ED visits and injury-related hospitalizations for the cohort of IPV-involved individuals were reported as counts and as population rates. Volume was defined as summed total counts for the year 2010. Rates were computed as defined below:

- (i) Actual visit rates were computed using the same algorithm as that employed to standardize national rates [43, 44]: ED visits $[(\text{number of visits})/(\text{total population}) * 100 \text{ individuals}]$ and hospitalizations $[(\text{number of hospitalizations})/(\text{total population}) * 10,000 \text{ individuals}]$.
- (ii) Expected ED visit rates were calculated using the National Hospital Ambulatory Medical Care 2010 emergency department summary tables. Expected rates for the injury-related hospitalizations were calculated using the National Center for Health Statistics rates of discharges from short-stay hospitals in 2010, the ICD-9-CM diagnosis category for injury and poisoning (ICD-9-CM 800–999) excluding poisonings (ICD-9-CM 960–989) and complications (ICD-9-CM 996–999).
 - (a) *Age Adjustment.* Expected rates, both ED and injury-related hospitalizations, were adjusted for the age distribution of the study sample using national age-groupings and the indirect method of adjustment [43, 44].

2.3. Statistical Analysis. Descriptive statistics were reported for sample demographics, crime-incident characteristics, and acute care visit characteristics. Statistical analyses compared demographics across victim/perpetrator status groups using

TABLE 1: Characteristics of IPV-involved individuals, stratified by IPV victim/perpetrator status.

	Total IPV-involved individuals (N = 2,937) % (#)	Victim/perpetrator status during 2010			p value ^a
		Victim only (N = 1,419) % (#)	Perpetrators only (N = 1,387) % (#)	Bidirectional (N = 131) % (#)	
Gender					
Female	50.4 (1445)	78.8 (1078)	21.6 (295)	55.4 (72)	<.001
Male	49.6 (1420)	21.2 (290)	78.4 (1072)	44.6 (58)	
[Missing]	[72]	[51]	[20]	[1]	
Race					
White	53.2 (1431)	55.8 (702)	50.3 (661)	55.7 (68)	.013
Black	45.2 (1218)	42.2 (530)	48.3 (634)	44.3 (54)	
Other	1.6 (43)	2.0 (25)	1.4 (18)	— (0)	
[Missing]	[245]	[162]	[106]	[9]	
Age (years)					
<25	33.1 (947)	34.9 (468)	31.1 (431)	36.6 (48)	.093
25–30	20.3 (581)	20.8 (279)	19.7 (273)	22.1 (29)	
31–40	24.0 (686)	23.0 (309)	25.6 (355)	16.8 (22)	
>40	22.5 (644)	21.3 (285)	23.6 (327)	24.4 (32)	
[Missing]	[79]	[78]	[1]	[0]	
Average # of IPV incidents in 2010 (SD)	1.24 (0.62)	1.16 (0.50)	1.19 (0.54)	2.61 (0.93)	<.001
Range in # of incidents in 2010	1 to 6	1 to 6	1 to 6	2 to 6	NA
% with multiple IPV incidents	16.8 (493)	11.8 (167)	14.1 (195)	100 (131)	<.001

^aPercentages and p values based upon valid, nonmissing responses.

Boldface indicates statistical significance ($p \leq .05$).

Pearson Chi-Square test for nominal data and ANOVA, with Bonferroni correction, for continuous count variables. Rates of expected ED visit and injury hospitalizations were compared against actual rates, between victim/perpetrator status groups, and for ED visits, by gender. Rate comparisons were conducted using multiple *t*-tests, corrected with Bonferroni. Significance tests were two-tailed with a significance level of 0.05. Analysis, conducted in 2012–2013, was completed using SPSSv.20.

3. Results

3.1. Sample Characteristics. The 2,937 study individuals were involved in a total of 1,807 separate IPV criminal incidents during the study year 2010. As seen in Table 1, a minority of individuals (16.8%, $n = 493$) were involved in multiple incidents. An even smaller group, 4.5% ($n = 131$), were alternately the victim and the perpetrator in these crimes, meeting study criteria for bidirectional violence; twenty-four of these had dual-arrest incidents, where police could not identify a primary aggressor and thus submitted charging requests against both individuals for the same incident. In general, females predominated as the victims and males as the perpetrators, except for the bidirectional group, where gender split was more equal.

At the time of the IPV-crime incident, the majority of couples were unmarried and still together and had experienced prior violence, as reported by the victim (see Table 2). Severe violence, indicated by charges of aggravated assaults, sexual assault, or kidnapping, accounted for 5.5% of incidents. The available information on victim injury demonstrated the relative minor nature of most assaults; although with the large amount of missing data, this conclusion is a tentative one.

Incidents involving bidirectional individuals were associated with higher rates of reported prior violence (92.0%, $p < .001$, not shown) and moderately higher levels of victim injury (74.2% minor injury and 3.2% major injury, $p < .001$, not shown). Significantly fewer cases involving bidirectional individuals were prosecuted: 34.1%, 147 of 223, of incidents were accepted for prosecution compared to 49.9%, 906 of 1807, of cases overall ($p < .001$, not shown).

3.2. Volume of Emergency Department Visits and Injury-Related Hospitalizations. As depicted in Table 3, among the 2,937 IPV-involved samples, 52.3% had at least one ED visit during 2010, the year their known IPV crime occurred. The number of ED visits by these individuals ranged from 1 to 77 visits and averaged significantly higher than non-IPV patients (mean of 3.44 visits (CI 3.20 and 3.69) for IPV-involved ED

TABLE 2: Characteristics of IPV charging request incidents, 2010.

	Total IPV incidents during study period ^a (N = 1,807) %
At time of incident	
Marital status	
Married	21.4 (348)
[Missing]	[180]
Relationship status	
Together	83.7 (1361)
[Missing]	[180]
Previous IPV	
Yes	82.8 (515)
[Missing]	[1,185]
Incident	
Charge category	
Assault (simple)	81.3 (1,453)
Stalking/harassment	4.9 (88)
Nonassault (property, etc.)	5.0 (89)
Aggravated assault	4.8 (86)
PPO violation	2.6 (47)
Criminal sexual cond.	0.5 (9)
Child abuse	0.5 (9)
Kidnapping	0.3 (6)
Cruelty to animals	0.1 (1)
[Missing]	[19]
Victim injury	
None noted	27.8 (207)
Minor injury	69.5 (517)
Major injury	2.6 (19)
Fatal injury	0.1 (1)
[Missing]	[1,063]
Victim transported to hospital	
No	87.2 (622)
Yes	12.8 (91)
[Missing]	[1,094]
Drug/alc. involvement	
No	44.9 (265)
Yes	55.1 (325)
[Missing]	[1,217]
Charge class	
Civil	2.6 (47)
Misdemeanor	86.2 (1557)
Felony	11.2 (203)
Defendant disposition	
Denied	50.1 (906)
Dismissed	17.2 (311)
Pled lesser	4.6 (83)
Convicted	25.6 (462)
Not guilty	0.3 (5)
Open	2.2 (40)

^aPercentages values based upon valid, nonmissing responses.

patients and mean of 1.78 visits (CI 1.76 and 1.79) for non-IPV-involved ED patients). In sum, the number of ED visits generated by the IPV-involved sample ($N = 5,285$ visits) represented 3.2% of the total 163,995 visits by all patients in 2010. Despite higher volume and known exposure to physical violence, though, IPV-involved patients were no more likely to present to the ED with an injury complaint than non-IPV patients and were significantly less likely to be hospitalized for an injury. Further, the vast majority of ED visits did *not* occur the same day as the known IPV crime; those that did were much more likely to be for injury complaints (69.0% of same-day visits compared to 19.0% of total visits, $p < .001$, not shown). Finally, among the victim/perpetrator status groups, bidirectional individuals had the highest ED utilization, the most injury-related ED visits, the greatest likelihood of an ED visit on the same day as a known IPV crime, and the greatest likelihood of hospitalization.

Table 3 further shows that injury-related hospitalizations were rare events, even among the IPV population, with only 0.4% of the total ED visits during 2010 leading to an injury-related admission. Just a portion of these (25.0%) occurred on the same day as the IPV crime.

3.3. Rates of Emergency Department Utilization. As illustrated in Table 4, IPV-involved individuals had actual annual visit rates that were more than 4 times higher than the expected age-adjusted rate, based upon national utilization calculations: 179.9 per 100 persons actual visit rates compared to 44.0 per 100 persons expected ED visit rate. Females, regardless of IPV involvement, had significantly higher ED visit rates than males, with Relative Risk of 4.5 for females and Relative Risk of 3.5 for males (not shown), a disparity that held true across the three victim/perpetrator status groups. Beyond this gender effect, ED utilization varied strongly by victim/perpetrator status: bidirectional individuals had the highest rates, followed by victim-only individuals and, lastly, perpetrator-only individuals.

3.4. Rates of Injury-Related Hospitalization. Hospitalization was a low-base rate phenomenon, with only 5 hospitalizations expected for this relative young population (77.5% under age 40). As a result, the confidence intervals around hospitalization rates were quite broad, especially in the subgroup analysis. Nonetheless, a pattern similar to the ED utilization emerged. Actual rates of injury-related hospitalizations by IPV-involved individuals, 68.1 hospitalizations per 10,000 persons, were statistically significantly higher than the expected rate of 17.0 per 10,000 persons, by a ratio similar to ED utilization: Relative Risk of 4.0. Victim/perpetrator status, again, was associated with differential utilization, with bidirectional individuals having the highest rates, although the difference was not statistically significant once corrected with Bonferroni for multiple comparisons. Unlike ED visits, though, victim-only and perpetrator-only rates flipped. With hospitalization rates of 14.1 per 10,000 persons during 2010, victim-only individuals had the lowest rates of injury-related hospitalization, during the year of the police-identified IPV crime. Perpetrator-only individuals, on the other hand, had significantly higher hospitalization, with an annual rate of

TABLE 3: Characteristics of emergency department visits and injury-related hospitalizations, 2010.

Emergency department visits	ED patients not known to be IPV-involved (N = 87,964)	Total IPV-involved individuals (N = 2,937)	p value ^a	Victim/perpetrator status during 2010			p-value ^a
				Victim only (N = 1,419)	Defendant only (N = 1,387)	Bidirectional (N = 131)	
Prevalence ED	NA	52.3% (1,536)	—	54.5% (774)	45.5% (631)	100% (131)	<.001
Total # ED visits	158,710 visits	5,285 visits	—	2,891 visits	1,909 visits	485 visits	—
(Among ED patients)	(n = 87,964)	(n = 1,536)		(n = 774)	(n = 631)	(n = 131)	
Average # ED visits (SD)	1.8 (2.0)	3.4 (4.9)	<.001	3.7 (5.5)	3.0 (4.2)	3.7 (4.2)	.021
(Among ED visits)	(158,710)	(5,285)		(2,891)	(1,909)	(485)	
Visits with injury code	19.3% (30,690)	19.0% (1,005)	.503	17.2% (496)	20.8% (398)	22.9% (111)	<.001
(Among ED visits)		(5,285)		(2,891)	(1,909)	(485)	
ED visit same day as crime	NA	3.8% (203)	—	4.8% (138)	1.9% (36)	6.0% (29)	<.001
(Among ED visits)	(158,710 visits)	(5,285 visits)		(2,891)	(1,909)	(485)	
Injury-related hospitalization	1.1% (1,812)	0.4% (20)	<.001	0.1% (2)	0.7% (13)	1.0% (5)	.007
(Among hospitalizations)		(20)		(2)	(13)	(5)	
Hospitalization same day as crime	NA	25.0% (5)		50.0% (1)	15.4% (2)	40.0% (2)	.385

^aBoldface indicates statistical significance ($p \leq .05$).

TABLE 4: Comparing age-adjusted expected and actual visit rates among IPV-involved individuals.

Emergency department visits	Age-adjusted expected visits by IPV population (N = 2,937)	Actual visits by IPV population (N = 2,937)	Victim/perpetrator status during 2010		
			Victim only (N = 1,419)	Perpetrator only (N = 1,387)	Bidirectional (N = 131)
Crude # of visits	1,292 visits	5,285 visits	2,891 visits	1,909 visits	485 visits
Rate of visits ^a (CI)	44.0 (41.6, 46.5)	179.9 (175.1, 184.9)	203.7 (196.4, 211.3)	137.6 (131.5, 144.0)	370.2 (338.0, 404.7)
Relative Risk ^b	—	4.1 RR	4.6 RR	3.1 RR	8.4 RR
Rate of visits by gender (CI)					
Female	53.3 (49.6, 57.2)	238.6 (230.7, 246.7)	236.3 (227.2, 245.6)	187.7 (172.7, 203.6)	413.7 (368.4, 463.1)
Male	37.0 (33.9, 40.3)	128.7 (122.8, 134.7)	109.9 (98.2, 122.5)	122.5 (116.0, 129.3)	315.5 (271.5, 364.7)
Injury-related hospitalizations	Expected # of visits by IPV Population (N = 2,937)	Actual # of visits by IPV population (N = 2,937)	Victim/perpetrator status during 2010		
			Victim only (N = 1,419)	Perpetrator only (N = 1,387)	Bidirectional (N = 131)
Crude # of visits	5 visits	20 visits	2 visits	13 visits	5 visits
Rate of visits ^c (CI)	17.0 (5.5, 39.7)	68.1 (41.6, 105.2)	14.1 (1.7, 50.9)	93.7 (49.9, 160.3)	381.7 (123.9, 890.7)
Relative Risk ^b	—	4.0 RR	0.8 RR	5.5 RR	22.5 RR

^aRate per 100 persons. Rate calculation = [(# visits)/(# in population)] × 100.
^bRelative Risk compared to expected number of visits: [actual # visits/expected # of visits].
^cRate per 10,000 persons. Rate calculation = [(# visits)/(# in population)] × 10,000.
Note: hospitalization cell sizes too small to further stratify by gender.
Boldface indicates statistical significance ($p \leq .05$).

93.7 per 10,000 persons during the same year as their IPV perpetration, 2010.

4. Discussion

Compared to national rates, the IPV-involved study sample had four times higher rates of ED visits and injury-related hospitalizations. More than half of the sample had visited an ED at least once during the year of the IPV crime, although only a handful of ED visits occurred on the same day as the known crime and rarely led to injury-related hospitalizations. This study further demonstrated that gender differences were more marked than among non-IPV-involved ED patients and that patterns of utilization varied by victim/perpetrator status and differentially between acute care settings. Conducted in a community with poverty, crime, and acute care capacity comparable to the nation, study findings add to the literature by documenting that the high utilization well-known for female IPV victims [1, 22, 50–52] was also true for male victims and for perpetrators of both genders.

This study is one of the first to clearly identify that bidirectionally violent individuals had the highest levels of both ED visits and injury-related hospitalizations, regardless of their gender. Outside healthcare, the IPV literature has detailed a variety of scenarios that can lead to bidirectional violence, including sparring between equal partners, strong mutual aggression, and systemic one-sided abuse where the victim has resorted to violence in self-defense [53, 54]. Regardless, the higher acuity of these cases, within this study and documented in others [32, 55], highlights the significance of bidirectional violence as a strong marker of injury risk and subsequent trauma care. This is particularly significant when considering that these cases are often dropped by criminal courts, the mutuality of violence making them difficult to prosecute [56]. Within the healthcare system, policies promoting screening exclusively for victimization but not perpetration [57] may also be missing the mark, as knowing which victims are also perpetrators could help triage them into high priority for community service referrals and safety planning, interventions they may not be getting within the criminal justice system.

Two other patterns revealed by study comparisons were the relatively high ED utilization by female victims and high injury-related hospitalization of perpetrators. While females tend to generate more ED visits than males across the nation [44], the elevated rate and volume of ED visits by IPV victims are consistent with prior literature documenting their greater injury [22, 29], the significant long-term physical and mental health sequelae associated with IPV [24, 50], and their high rates of medical help-seeking within EDs as well as primary care settings [22, 24, 32, 50]. The relatively lower visit rates by male victims are congruent with estimates of lower IPV-injury among this population [22]. The heightened rate by victims of both genders spotlights the opportunities which are clearly present in the ED for identification and linkage to community resources and suggests that these efforts be extended to include male victims. Given that the study measure of IPV was based upon criminal justice identification, a situation which applies to, at best, half of all

IPV couples [56], and that clinic-based studies have reported higher levels of IPV victimization than detailed in the current study, the true extent of these opportunities is likely even greater.

The picture emerging regarding hospitalizations by perpetrator-only individuals, a predominantly male group, was that they led victims in injury-related hospitalizations, both in volume and in comparison with age-matched national rates. While limited in number, other studies of injury-related medical hospitalizations by male perpetrators point to a different injury-related etiology than that of female victims: that individuals, such as IPV perpetrators, who are violent inside the home are also violent outside of it and that injuries leading to medical care are often inflicted by nonpartners, sometimes in the course of the perpetrator's own assaultive behavior [30, 33, 58–60]. The female-victim hospitalization levels found in this study are similar to national population studies and reflect the relatively minor nature of most IPV physical injuries [22, 61, 62]. Similar to ED visits, these low figures, however, likely undercount the actual presence of female victims on medical-surgical floors, which hospital-based surveys have found to be as high as that in EDs, up to 15% of patients [1, 2, 63].

5. Limitations

These findings should be viewed in light of the following study limitations. Due to concerns with safety, privacy, and stigma, IPV victims may not report assaults to police or seek medical care, which means this IPV study population, defined by both police and ED usage, may be a biased group, albeit one likely representing greater violence and severity [56, 64]. Additionally, operationalizing IPV as police-identified IPV crime, while narrowing the study sample, offers the advantage of an external measure that is not dependent upon either injury presentation to the ED or self-disclosure by a patient, common alternatives that can produce significant bias. As a geographically bound study, there is a chance that ED visits or IPV crimes involving the study population may have occurred outside the Kalamazoo County area and, thus, were not captured. With a 90.7% true-positive match rate, the linkage process did not identify roughly ten percent of ED visits, resulting in a conservative estimate of utilization. Additionally, as a secondary data analysis with low same-day visit incidence and a large amount of missing crime data on victim injury, the study was lacking important information connecting specific IPV assaults to injury and subsequent medical visits, leaving such relationships to be inferred. Finally, the demographic profile of the study site regarding racial composition and household type, different from the nation as a whole, may limit its generalizability.

6. Conclusions

This study documents that elevated emergency department visits and injury-related hospitalization exist for all IPV-involved individuals, with the highest rates by bidirectional-violence individuals and differential utilization by victim/perpetrator status, depending upon acute care setting.

Disclosure

Borgess Medical Center, Kalamazoo, Michigan, had no role in study design, collection, analysis, data interpretation, paper preparation, or the publication decision.

Conflict of Interests

The authors have no known conflict of interests regarding the content or findings contained within this paper. The study authors do not have any commercial association, current or over the past five years, that might pose a conflict of interests.

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