THE ASSOCIATION BETWEEN HOSPITAL POLICIES AND SERVICES AND THE EMERGENCY DEPARTMENT DIAGNOSIS OF INTIMATE PARTNER VIOLENCE

By

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CERTIFICATE OF APPROVAL

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Abstract

Importance: Intimate partner violence (IPV) affects 1.9 million U.S. women each year and is associated with high-risk health behaviors and increased medical and mental health needs. However, IPV remains a challenge for healthcare providers to identify. **Study Objective:** To assess the association between hospital IPV policies and services and the likelihood of IPV diagnosis in the emergency department (ED) in a statewide sample of Oregon hospitals. **Methods:** Using billing data assembled from 21 Oregon EDs from 2001 to 2005, we identified patients assigned a discharge diagnosis of IPV. We then surveyed ED administrators to gain information about IPV-related policies and services offered by the participating hospitals during the same time period. We combined billing data, survey results and hospital-level variables. Multivariate analysis assessed the likelihood of receiving a diagnosis of IPV depending on the policies and services available at each hospital. **Results:** In 754,597 adult female ED visits, IPV was diagnosed 1,929 times (0.26% of visits). Mandatory IPV screening and victim advocates (such as social workers) were the most commonly available IPV policies and services. The diagnosis of IPV was independently associated with the use of a standardized intervention checklist (OR 1.79, 95% CI 1.13-2.85). Public displays regarding IPV were negatively associated with IPV diagnosis (OR 0.55, 95% CI 0.37-0.83). **Conclusion:** Hospital-level policies and services such as standardized intervention checklists may improve the ability of clinicians to diagnose IPV.

INTRODUCTION

Intimate partner violence (IPV) is defined as any pattern of assaultive and coercive behaviors, including physical injury, psychological abuse, sexual assault, social isolation, stalking, deprivation, intimidation or threats perpetrated by someone who was or is in an intimate relationship with the victim.[1] IPV occurs at alarming rates, affecting an estimated 1.9 million U.S. women each year and 25% of U.S. women some time in their lives,[2-5] leading the Family Violence Prevention Fund to describe it as a health care problem of "epidemic proportions."[1]

IPV was not always seen as a health problem. In 1985, Surgeon General C. Everett Koop convened a workshop of national experts in interpersonal violence to broach the idea that addressing family violence was a public health issue. The meeting was a "new departure," as IPV had, up to this time, largely been considered a problem best handled by the legal system and social services. Stating that "the sheer number of victims… who cry out for help each year demands a public health response," Koop asked the participants to focus "squarely on how the health professions might provide better care for victims of violence and also how they might contribute to the prevention of violence." The workshop established an agenda for improved identification and management of IPV by healthcare providers, recommending the launch of an informational campaign to heighten awareness, coordinate research efforts, and improve information sharing among health professionals. The participants also advised making "spouse

abuse protocols… routinely available to personnel dealing with substance abuse, suicide, child

abuse, the homeless, and medical emergencies."

In the 24 years since Koop's initiative, the profound and wide-ranging role of IPV in

women's health has become better understood. IPV adversely affects eight of ten of the leading

health indicators identified by the Department of Health and Human Services (DHHS) and is

responsible for an estimated $4.1 billion in direct medical and mental health care costs.[4, 6] IPV

leads to risky health behaviors, including cigarette smoking, heavy alcohol use and drug use.

Associated mental health problems include depression, anxiety, post-traumatic stress disorder,

and suicidality.[7, 8] Pregnant women who are victims of IPV tend to have later entry into the

health care system and are at risk for placental abruption, preterm delivery, and low infant birth

weight.[9] IPV is also associated with worsening and poor maintenance of chronic conditions,

such as asthma, joint disease, peptic ulcer disease, chronic pain syndromes.[10-12]   IPV is

responsible for most intentional injuries experienced by women[13]; however, even women who

are solely victims of psychological abuse experience all other associated health problems.[11]

Though fatalities from IPV are relatively rare, they constitute 30-50% of all female homicides in

the U.S. each year.[2, 4]

The health care system continues to struggle with the best means of identifying and

managing IPV. In 1992, the Joint Commission on the Accreditation of Healthcare Organizations

(JCAHO) defined basic standards for hospital policies and procedures to increase the

identification of IPV within emergency departments (EDs) and hospital-based ambulatory care

centers.[14] Updated in 2004, the standards include maintenance of specific criteria for identifying

victims of IPV, identification of victims upon entry into the health care system (e.g., at ED triage), education of staff about the management of IPV, and appropriate assessment and referrals by staff.

Specific means of accomplishing these goals at a given hospital may vary widely. A comprehensive hospital IPV program may include aspects of the physical environment (e.g., posters or brochures) that encourage awareness and reporting of abuse, regular, ongoing education of clinical staff about IPV, a written hospital policy for the assessment and management of IPV, and advocacy services for victims of intimate partner violence that assist patients with legal counsel, counseling, and safe shelter.[15] There is a paucity of data about how commonly these services are utilized, but most hospitals probably do not maintain a full menu of services and fewer than half of EDs have algorithms for the management of abused women.[16] With little evidence about which practices, if any, actually translate into increased identification and treatment of abuse, hospitals with limited resources have nothing on which to base a decision about selective use of high-yield policies and services. Thus, although there is consensus that IPV is a public health problem, it is not clear how to ensure rigorous screening, detection, and appropriate responses in the health care setting.

The emergency department (ED) has an opportunity to play a key role in recognizing and intervening in abuse. The ED sees a disproportionately high prevalence of IPV[3, 4, 17-20] and is a frequent point of contact for victims of abuse in the time period before IPV escalates. In one study of women who reported IPV to the police, 64% were seen in the ED within the previous

year.[21] In a study of IPV homicides, 44% of victims had visited the ED within two years of their death, many due to injury.[22]

However, detecting IPV in the ED, as in all healthcare environments, is challenging, and clinicians rarely formally diagnose abuse.[23, 24] For patients, barriers may include a distrust of providers and fear of retaliation from perpetrators. For clinicians, barriers may include a lack of awareness of the prevalence of IPV and of the appropriate means of addressing IPV if disclosed. Certain elements specific to the ED environment exacerbate the difficulties of disclosure, including the lack of privacy during triage screening procedures, limited time for providers to gain rapport with patients, and overburdened social services. These problems may at least partially explain why ED IPV diagnosis rates are strikingly low; IPV is reported as a diagnosis in, just 0.12% of visits nationally.[23, 25]

The appropriateness of IPV screening in the ED environment might well be questioned. The most comfortable and open disclosures of abuse usually occur with clinicians victims know well in the context of a long-term therapeutic relationship.[26, 27] However, many IPV victims utilize the ED, often due to acute issues directly or indirectly related to IPV, such as injury, mental health problems or exacerbation of chronic medical illness. Victims may also lack primary care or have poor access to primary care.[28, 29] The reality is that the ED visit may be a rare point of contact with the healthcare system by victims and potentially the only opportunity to address abuse.

Oregon is a good representative setting for the study of IPV. The Oregon Women's Health & Safety Survey, a population-based survey of adult women in Oregon conducted

between 2001 and 2002, found that 1 in 10 Oregon women experienced IPV within the preceding five years and 3% of women within the preceding 12 months. Similar to national data, IPV is responsible for 46% of female homicides in the state.

ED visits represent an opportunity to identify and address IPV. Understanding which system-level factors assist ED practitioners in identifying abuse can help direct institutional resources to efforts likely to be most effective. The goal of this study was to examine a variety of hospital-based IPV policies and services among 21 Oregon hospitals and determine their association with the ED diagnosis of IPV. Our hypothesis was that the presence of IPV-directed policies and services would be positively associated with the diagnosis of IPV.

MATERIALS AND METHODS

The Theoretical Model of the Problem

Our conceptualization of the problem, the rationale for including specific variables, and how these variables were obtained and defined are discussed in detail in Appendix A.

Study Design

This was an observational study conducted in two parts: first, collection of administrative billing data from 21 Oregon EDs and second, standardized telephone survey of ED administrators at these same hospitals. Survey data were merged with billing data, hospital-level information, and additional zip-code based demographic information.

The Institutional Review Board of Oregon Health & Science University approved this study.

Setting

Oregon has a trauma system that categorizes the majority of hospitals (regardless of size or rural setting) by level of trauma center (I to IV); Levels I and II centers represent higher capacity trauma centers, whereas Levels III and IV hospitals are smaller centers with limited capacity.[30] Among the 21 hospitals, 17 are trauma centers (2 Level I centers, 2 Level II centers, 10 Level III centers, and 3 Level IV centers). According to the Oregon Office of Rural Health, 15 of the 21 hospitals are classified as rural hospitals and 5 are critical access hospitals. The number of staffed inpatient beds in these hospitals ranged from 21 to 447 in 2003, the midpoint of our dataset.

Selection of Participants

First, we created an analytic data set using electronic claims data.[31] In selecting EDs, we considered patient volume, urban versus rural location, designation as a Critical Access Hospital, rural hospital subgroup as defined by the Oregon Office of Rural Health, and the region of Oregon where the hospitals were located. According to these criteria, we identified 16 EDs that represented the range of Oregon EDs. Twelve of the 16 had informatics systems that could provide the necessary data and agreed to participate. The 4 EDs that did not participate were all small, rural EDs. However, we were able to recruit an additional 6 rural EDs. Finally, an opportunity arose to include an additional 8 urban EDs in the Portland region. Including these EDs allowed us to study 12 of the 13 EDs in the 3-county Portland region, representing 94% of ED visits in the region.

Four hospitals, representing one hospital system, were only able to provide data beginning in 2002 (May – November). To optimize overall sample size, these hospitals were dropped from the dataset. Another hospital had closed since data collection, so information about its IPV resources was not accessible; this hospital was also excluded. Characteristics of these excluded hospitals are shown in the Appendix. The final data set contained information on 2,228,169 visits to 21 Oregon EDs between February 1, 2001 and August 31, 2005, a total of 55 months. These visits represent about 52% of all visits to Oregon's 58 EDs. Although rural EDs are underrepresented, we included sufficient small, rural EDs to allow comparison of ED utilization patterns in these facilities versus larger, urban EDs. Characteristics of the hospitals included in the dataset are shown in Table 1.

To ascertain availability of hospital policies and services, we contacted ED

administrators for participation in the survey. In order to gauge how representative our sample

was of institutions in the state, we targeted all hospitals in Oregon, whether or not they were

included in the billing dataset. Administrators at one hospital could not be reached. Another

hospital deferred participation. Our final response rate was 96.5% (56 out of 58 EDS). Of

hospitals included in the billing dataset, 100% completed to the survey. Table 1 compares

characteristics of hospitals that did and did not participate in the billing dataset and/or survey.

Methods of Measurement

The billing dataset included standard hospital administrative fields such as age, gender,

insurance status, hospital disposition, and discharge diagnoses by ICD-9 codes. In addition,

unemployment rate was acquired for all Oregon zip codes from Nielsen Claritas Services for the

years 2001-2004 and merged with the master dataset. Data for 2005 were unavailable so we

imputed these values using linear extrapolation of data from 1990-2004. Hospital-level

variables, including bed size and urban/rural designation, were obtained from the Office for

Oregon Health Policy and Research (OOHPR).

The survey tool was adapted from the "Delphi Instrument for Hospital-Based Domestic

Violence Programs" developed by the Agency for Healthcare Research and Quality (AHRQ).[32]

The earliest form of the AHRQ instrument was developed for use in a multi-site study

evaluating the effectiveness of a training model to improve the ED response to IPV. The final

instrument was created using a consensus-driven Delphi process with the input of 18 national

IPV experts. The goal was to determine the appropriate measures for assessing the

completeness of a hospital's IPV program. AHRQ identified 37 program measures encompassing 9 domains of IPV program activities: hospital policies and procedures, physical environment, cultural environment, training of providers, screening and safety assessments, documentation, intervention services, evaluation activities and collaboration.

For this study, we selected six questions from the AHRQ tool that addressed policies and procedures most relevant to the ED setting and that included content relating to screening, physical environment, clinician education, and intervention (Figure 1). Prior to implementation, the survey was pilot tested among charge nurses and faculty from Oregon Health & Science University unaffiliated with the study. We ultimately dropped one question (# 4) because it overlapped in content with question # 1.

The telephone survey was administered over a one-month period from September to October, 2008. To characterize the services available during the period represented by the ED billing data, we asked administrators if a service was present and if so, to estimate how long each service or policy had been in place at their institution. If the services or policies were present but known to have been implemented after 2005, they were considered absent for purposes of this study. If implemented during or before the study period, they were considered present. We also asked administrators to provide a copy of their written IPV policy. Nine hospitals (seven in the study group) provided an IPV policy. In one case, we were able to resolve uncertainty of dates by the policy origination date.

Outcome Measures

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Our outcome was the ED diagnosis of IPV as identified and coded by clinicians. Various ICD-9 code groupings have been used to capture IPV diagnoses; no single, standard definition has been validated.[23, 33-35] We defined female abuse by ICD-9 codes of 995.80-995.83 (adult maltreatment; physical, emotional/psychological, and sexual abuse), 995.85 (multiple forms of abuse) and/or the external cause of injury code E967.3 (by spouse or partner, ex-spouse or ex-partner). We avoided overlap with elder abuse by limiting the analysis to patients less than 65 years of age.

Primary Data Analysis

To avoid the bias associated with complete case analysis and to allow inclusion of all eligible observations in the sample, we assigned values to missing data points in the billing dataset using multiple imputation.[36-39] Multiple imputation, which estimates missing values by examining existing patterns of other covariates, has been used in many areas of clinical research.[36, 39-43] The amount of missing data in the variables used from the trauma registry varied from none to 39% (Table 2).

We used descriptive statistics (mean, proportions) to characterize the sample and multivariable logistic regression to test the association between hospital services and diagnosis of IPV. We selected variables that had previously described associations with IPV or that were logical potential predictors of IPV; we did not use stepwise techniques or univariate analysis as criteria for inclusion in the model. Predictor variables included age,[17, 44] shift and day of the week of presentation,[45, 46] diagnoses related to injury,[47-49] alcohol and drug use,[29, 44, 50] mental health[49, 51-53] and pregnancy,[54, 55] and insurance and unemployment (from zip code-based estimates) as indicators of socioeconomic status.[44, 48, 56] Hospital-level characteristics that might

influence the availability of resources were also incorporated into the model, including bed size and rural/urban setting.To account for the non-independence of observations at hospitals, standard errors were adjusted by clustering at the hospital level. Statistical significance was defined as a probability of a type I error of less than 5% (2-tailed). Results are expressed as odds ratios (ORs) with 95% confidence intervals (CIs). Analyses were conducted with Stata, version 10.1 (StataCorp LP, College Station, TX).

Sensitivity Analyses

Occasionally, administrators were uncertain about the dates of initiation of a resource. Because this typically indicated that the resource had not been recently implemented – in which case administrators would likely recall introducing it to their staff – we considered these policies or services present during the study period in the primary analysis. However, we also performed two subanalyses to gauge the extent to which this uncertainty could have affected our results. First, we repeated the analysis only including responses given with certainty, and excluding any responses that were uncertain. Second, we repeated the analysis assuming policies and services not known to be present were absent.

To validate the multiple imputation process, we took a single subset of imputed data without missing values and artificially removed values at random to create missingness. We then repeated the imputation on this simulated dataset.

RESULTS

Characteristics of Study Subjects

There were 754,597 adult female ED visits to the 21 hospitals in our database over the

42-month study period. The diagnosis of IPV was made 1,929 times, or in 0.26% of visits.

Descriptive results are displayed in Table 2. Fifty-one percent of patients diagnosed with IPV

were between the ages of 18-33; 82% were white, and 10% were black. Twenty-seven percent

were uninsured; 44% were Medicaid enrollees. Most patients (87%) identified as IPV victims

received injury diagnoses.

Results of the ED administrator survey are shown in Table 3. Most hospitals (81%) had a

written policy mandating screening in the ED and some level of on-site victim advocacy (76%),

whether part-time or full-time. Regular clinician education about IPV and public display

materials such as posters or brochures related to IPV were also common among the hospitals in

our study.

The results of the multivariate analysis are shown in Table 4. Younger age and Native

American and black races were independently associated with greater odds of receiving an IPV

diagnosis. Compared to patients with commercial insurance, Medicaid enrollees and the

uninsured were more likely to receive a diagnosis of IPV. Injury, alcohol-related problems,

mental health conditions, and pregnancy were all independently associated with the likelihood of

IPV.

Main Results

Of the hospital policies and services assessed, one resource was independently associated

with increased odds of receiving an IPV diagnosis: a standardized intervention checklist for the

management of IPV (OR 1.79, 95% CI 1.13-2.85). The use of public displays regarding IPV

was associated with decreased odds of receiving an IPV diagnosis (OR 0.55, 95% CI 0.37-0.83).

We did not find an association between other studied resources and IPV diagnosis; although

most diagnoses were made in hospitals with mandatory screening policies and onsite victim

advocacy services, after adjusting for hospital size and location and patient factors, these

relationships were not significant.

　　　We also considered whether victim advocacy services would be more likely to have an

impact if available during overnight shifts and weekends, when IPV victims would be more

likely to present to the ED.[46] We recoded this variable based on level of availability: no

advocacy services, limited daytime or weekday hour advocacy services, and full time, 24 / 7

advocacy services. Analysis using this categorization, however, showed no association between

any level of victim advocacy services and IPV diagnosis.

Sensitivity Analyses

　　　Results of the sensitivity analyses are shown in Appendix B and C. In the first sensitivity

analysis (excluding any uncertain responses), part-time (OR 4.14, 95% CI 1.23-13.86) or any

(OR 2.77, 95% CI 1.07-7.22) victim advocacy and regular clinician training (OR 2.41, 95% CI

1.15-5.07) were associated with increased odds of IPV diagnosis. In the second model (assuming

policies and services not known to be present were absent), all levels of victim advocacy were

associated with an increased odds of diagnosis (part-time victim advocacy, OR 7.63, 95% CI

2.97-19.63; full-time victim advocacy, OR 4.47, 95% CI 2.13- 9.37; any victim advocacy, OR

2.76, 95% CI 1.32-5.76), as was regular clinician training (OR 3.27, 95% CI 1.74-6.17).

Mandatory ED IPV screening was negatively associated with IPV diagnosis (OR 0.38, 95% CI

0.20-0.73). The intervention checklist remained positively associated with IPV diagnosis in both

sensitivity analyses (OR 4.78, 95% CI 1.76-12.97; OR 5.93, 95% CI 2.14-16.43). The use of

posters or brochures remained negatively associated with IPV diagnosis (OR 0.19, 95% CI 0.07-

0.50; OR 0.15, 95% CI 0.05-0.43). Wide confidence intervals for all these estimates reflect the

small number of hospitals with these programs in place under the assumptions of the

subanalyses.

Repeating multiple imputation using a dataset in which we simulated patterns of

missingness, we obtained values similar to those obtained from multiple imputation with the

original dataset.

LIMITATIONS

We note the distinction between identifying IPV and *documenting* that IPV was identified. The outcome, the presence of a discharge diagnosis of IPV, is only as accurate as the coding and documentation practices of ED clinicians. The comparison group of patients who were not diagnosed with IPV must include victims who were either not identified or were identified but, for a variety of reasons, not given a formal diagnosis. Some patients may have been suspected as having abuse but due to diagnostic uncertainty, did not have this documented. Others may have been definitively diagnosed as having abuse and even treated for abuse, but without adequate documentation. Some cases may have been miscoded or coded in a way not captured by our outcome criteria. On the other hand, IPV is known to be under-diagnosed in the ED, and our findings are not inconsistent with prior studies showing extremely low rates of inquiry and detection.

The potential for reverse causality is another limitation of the study. It is possible the intervention checklist was implemented at certain sites in response to increased diagnosis of IPV and a recognized need to have a strategy for addressing it. Yet, again, the rates of documented IPV were extremely low in our study, representing just 0.26% of the adult female ED patient population. IPV seems a rarely diagnosed clinical entity to have driven hospital policy.

Having a policy or service in place does not mean it was used with all patients. Larkin et al found that a "mandatory" screening policy was used in just 29.5% of patients.[57] If providers at times failed to implement "standard" policies or services, this would likely weaken the strength of a true association and may have contributed to the lack of association we found with many of the resources and IPV detection in the primary analysis.

As with any survey data, our findings may be limited by recall bias. ED administrators may have been more likely to report the presence of resources even if not sure or not present, particularly if they were aware that certain resources are prescribed by JCAHO. Further, since we were attempting to correlate services with data obtained between 2001 and 2005, we asked administrators to think back several years, creating more potential for errors in information. However, our questions did not demand knowledge of specifics; we asked about general policies and services and broad date ranges rather than specific dates. For each question, we also provided the option of answering "I don't know," so administrators would not be obligated to make a guess in one direction or the other.

This uncertainty about dates of implementation of policies or services was another limitation of this study. We performed sensitivity analyses to gauge the range of possibilities contained in this uncertainty. It is interesting to note that two resources (victim advocacy, regular clinician training) demonstrated an association with IPV diagnosis only in the subanalyses. It is possible that misclassification errors based on incorrectly assuming that resources were present lessened a true association between these resources and IPV diagnosis in our primary analysis. Alternatively, the uncertainty about when a service was implemented may reflect that the resource is not a priority or is not commonly utilized in the ED; the subanalyses may then have the effect of assessing only the sites where the services or policies were more rigorously implemented.

Because our study was limited to the state of Oregon, the findings may not be generalizable to the entire U.S. However, the hospitals sampled represented a range of practice settings, with varying bed sizes, trauma capabilities, and urban and rural locations. Furthermore,

the patient population in our study seems comparable with other states: the characteristics of the identified IPV victims in our sample are consistent with prior studies of IPV victims in the ED, and estimates of IPV incidence and prevalence in the state of Oregon are comparable to national statistics.[58]

DISCUSSION

In this study of 21 Oregon EDs, we examined potential associations between five hospital IPV policies and services and ED diagnosis of IPV. We found a positive association between use of a standardized intervention checklist and ED diagnosis of IPV. We found a negative association between having public displays, such as posters or brochures, regarding IPV, and ED diagnosis of IPV.

It may not be immediately obvious that an intervention checklist would positively influence clinicians' ability to diagnose IPV; after all, one must first identify IPV in order to subsequently use a checklist. However, an accessible intervention tool may contribute to an environment in which IPV is likely to be considered and identified. Fear of "opening Pandora's Box" has long been recognized as an important barrier to providers assessing for IPV.[59] Rhodes et al. demonstrated that clinicians responded with awkwardness and uncertainty to disclosures of abuse and had difficulty following through with formal diagnoses or referrals to counseling or social work services.[24] Our findings may reflect that clinicians are empowered to identify IPV when they know they can respond to the diagnosis with definitive action.

On-site victim advocacy services, another resource for intervening in abuse, was not associated with IPV diagnosis in the ED in our primary analysis. There are several potential explanations for this finding. Victim advocates may take ownership over issues of abuse and minimize the physician's role, decreasing physician documentation of abuse and weakening the apparent association. In many EDs, though, the role of victim advocacy is assumed by social workers or nurses who have many other responsibilities – such as addressing alcohol or drug addiction, evaluating psychiatric patients, or communicating with families of critically ill

patients – and thus may not be as consistently available to address IPV as something like a

checklist. Alternatively, it may be that the critical issue for detection is having a standardized

approach to IPV management, regardless of whether it is performed by a physician, nurse, or

social worker. In analyses that included only sites where ED administrators expressed certainty

that victim advocacy was available during the study period, this service had a positive

association with IPV diagnosis, suggesting it may play some role in assisting clinicians detect

and address IPV among their patients.

Regular education of clinicians on IPV did not show an association with IPV diagnosis in

the primary analysis of our study. Earlier studies have demonstrated short-term gains, if any, in

IPV identification or referral rates after educational interventions, even with rigorous team

trainings.[60-62] Consequently, more emphasis has been placed on the importance of system-level

mechanisms, such as chart prompts or protocols for screening, as an alternative or addition to

education of staff for identification and management of abuse.[63]   As with victim advocacy,

clinician training showed an association with ED IPV diagnosis in the sensitivity analysis,

suggesting that in some circumstances, it may aid in the identification of IPV.

Despite controversy as to the effectiveness of routine IPV screening in reducing

morbidity or mortality, [64, 65-67] there is compelling logic for screening,[68, 69] and routine

assessment of patients for violence has been mandated by JCAHO and supported by most major

medical societies, including the American College of Emergency Physicians (ACEP).[70]

However, requiring screening questions does not guarantee that clinicians implement them

consistently and effectively, nor that they respond appropriately to disclosures of abuse.[24] While

81% of hospitals in our study had a policy mandating screening for IPV in the ED, this did not

increase odds of making an IPV diagnosis. Our findings may reflect that simply mandating screening – without providing effective and accessible means of intervening in abuse once it is identified – will have a limited impact on victims.

The use of posters or brochures addressing IPV has been described as part of an integrated approach to improving identification of IPV in clinical settings.[62, 71] We found a negative association between the use of public displays and the diagnosis of IPV. These findings were similar to those of Bair-Merritt et al. in a 2006 pediatric ED study.[72] The investigators found that fewer women supported screening or stated they would disclose abuse after domestic violence posters and hotline cards were put on display. It may be that patients who obtain IPV resources from a poster or brochure feel they no longer need to discuss violence with their healthcare provider, or that public displays inadvertently project an image or message that is not welcoming to victims of abuse. Another possibility in our study is that public displays represent hospital qualities that were not captured. A poster or brochure is an option that requires minimal effort, expense, and personnel involvement, and may represent a passive approach to addressing violence or lack of resources for other IPV programs.

Standardized resources such as an intervention checklist are attractive in the ED for a number of reasons. They can be administered with good reproducibility by practitioners of all levels and backgrounds. They are low-technology and inexpensive so can be implemented with ease in EDs of any size. They provide consistency of care in a chaotic, high-acuity setting. As with the Pronovost checklist,[80] which reminds physicians of the minimum requirements for sterile central line placement in the intensive care unit, an intervention checklist for IPV victims is a simple yet potentially powerful tool that reminds ED clinicians to do the bare minimum for

victims of violence: assess immediate safety concerns, ask about children at home at risk for

abuse, offer IPV counseling services or safe shelter, remind the patient to call 911 should they

feel unsafe. These actions may seem mere common sense, but clinicians rarely perform them,

failing to take advantage of an important window of opportunity for intervention.[22]

SUMMARY AND CONCLUSIONS

We found a positive association between hospital-level services and the ED diagnosis of IPV. Use of a standardized checklist is a hospital-level policy that may aid in the identification of patients who are victims of IPV. Targeting affordable and effective hospital resources for detecting IPV in the ED setting may help create much-needed improvements in our care of female patients by increasing identification of IPV and, ultimately, closing the gap between healthcare needs and interventions for abused women.

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Figure 1: Survey of ED Administrators*

1. Is there an official policy in place that requires mandatory screening of all women for domestic violence in the ED?
2. Does the hospital or ED provide regular, ongoing training on domestic violence for nurses and/or doctors working in the ED?
3. Are there posters and/or brochures on domestic violence on public display in your ED?
4. Is there a standard intervention checklist for staff to use/refer to when domestic violence victims are identified?
5. Are on-site victim advocacy services for domestic violence provided in the ED?

*"Domestic violence," instead of "intimate partner violence," was used for the survey, assuming that this older term would be most familiar to hospitals and their staff.

Table 1. Characteristics of participating and non-participating hospitals*

	Hospitals participating in billing data and survey	Hospitals participating in survey only	Non-participating hospitals
Total N	21	31	2
Bedsize Mean(median)	181 (129)	58 (37)	199†
Level 1 Trauma centers†† N(%)	2 (10)	0	0
Level 2 Trauma centers N(%)	2 (10)	1 (3)	0
Level 3 Trauma centers N(%)	7 (33)	10 (33)	1 (50)
Level 4 Trauma centers N(%)	2 (10)	14 (47)	0
Urban hospitals N(%)	15 (71)	8 (26)	1 (50)
Critical access hospitals N(%)	3 (14)	15(48)	1 (50)

*According to the Oregon Office of Rural Health. Data are from 2003, the midpoint of our dataset.

†Only 2 values; mean calculated.

††Oregon has a total of 2 Level 1 trauma centers.

Table 2. Characteristics of ED patients with and without the diagnosis of IPV

Patient characteristic	IPV +		IPV-		Imputed
	N	%*	N	%*	Values, %
Total	1,929	100	752,668	100	
Age					0
18-33	985	51	314,813	42	
34-49	830	43	290,073	39	
50-64	114	6	147,782	20	
Race/Ethnicity					39
Asian	18	1	8,490	1	
Black	177	10	39,526	5	
Hispanic	85	4	39,456	5	
Native American	28	1	4,790	1	
White	1,573	82	644,773	86	
Other	48	2	15,633	2	
Insurance					<1
Commercial	399	21	281,827	37	
Medicaid	840	44	221,548	29	
Medicare	72	4	49,278	7	
Uninsured	539	27	130,728	17	
Other	79	4	69,287	9	
Percent unemployment†					0
<5.96%	857	44	374,686	50	
≥5.96%	1,072	56	377,982	50	
Day of presentation					0
Weekday	1,289	67	525,187	70	
Weekend	640	33	227,481	30	
Shift of presentation					16
Day shift	522	30	278,778	37	
Evening shift	741	43	352,711	47	
Night shift	468	27	121,179	16	
ED disposition					<1
Admitted	79	4	77,264	10	
Discharged	1,850	96	675,404	90	
Selected discharge diagnoses‡					N/A
Injury	1,683	87	171,477	23	
Mental health	147	8	67,152	9	
Alcohol related	109	6	15,584	2	
Drug related	22	1	11,684	2	
Pregnancy related	44	2	30,616	4	

* Because of rounding, percent values may not add to exactly 100%.

†Percent unemployment in zip code area of home address, compared to median unemployment rate in our dataset.

‡Diagnoses are not mutually exclusive; all secondary diagnoses fields were searched to identify conditions. Patterns of missingness do not apply to this field, as we searched for the presence of selected diagnoses only.

Table 3: Results of ED Administrator Survey of IPV Policies and Services

Service / Policy	N (%) of hospitals with policy/service	N (%) IPV diagnoses made at hospitals with this policy/service*
Mandatory screening policy	17 (81)	1,825 (95)
Regular clinician training	10 (48)	1,106 (57)
Public displays regarding IPV	10 (48)	644 (33)
Standard intervention checklist	3 (14)	680 (35)

On-site victim advocacy services
    Part-time
    Full-time
    Either part-time or full-time
	
	10 (48)
	6 (29)
	16 (76)
		
		663 (34)
		1,089 (57)
		1,752 (91)

*Percentage represents proportion of IPV diagnoses made among all hospitals in the dataset.

Table 4. Adjusted odds of diagnosis of IPV using multivariable logistic regression

Patient & hospital factors	OR (95% CI)*
Age	
18-33	Reference
34-49	0.94 (0.84-1.05)
50-64	0.33 (0.28-0.39)
Race/Ethnicity	
Asian	1.29 (0.55-3.01)
Black	1.57 (1.17-2.11)
Hispanic	1.01 (0.77- 1.55)
Native American	1.83 (1.01-3.36)
White	Reference
Other	1.44 (0.90- 2.31)
Insurance status	
Commercial	Reference
Medicaid	2.55 (2.21-2.95)
Medicare	1.44 (1.12-1.85)
Uninsured	2.43 (2.16-2.74)
Other	0.25 (0.15-0.41)
Percent unemployment	
<5.96%	Reference
≥5.96%	1.06 (0.89- 1.27)
Day of presentation	
Weekday	Reference
Weekend	1.05 (0.99- 1.12)
Shift of presentation	
Day shift	Reference
Evening shift	1.05 (0.92-1.20)
Night shift	2.21 (1.83-2.69)
Selected discharge diagnoses	
Injury	33.13 (24.25-45.26)
Mental health	1.61 (1.29-2.01)
Alcohol related	2.30 (1.86 -2.85)
Drug related	0.81 (0.57-1.17)
Pregnancy related	1.49 (1.20-1.86)
Inpatient bed size (per 10-bed increase)	0.99 (0.96-1.02)
Practice setting	
Rural	0.97(0.39-2.44)
Urban	Reference
Mandatory screening policy	1.13 (0.52-2.42)

Regular clinician training	1.16 (0.70-1.93)
Public displays regarding IPV	0.55 (0.37-0.83)
Standard intervention checklist	1.79 (1.13-2.85)

On-site victim advocacy services
    Part-time
    Full-time
    Either part-time or full-time
	1.73 (0.73-4.06)
	1.79 (0.63- 5.06)
	1.73 (0.74-4.03

*In multivariate analysis that includes patient demographic and visit information, discharge diagnoses, hospital-level variables, and survey results.

Appendix A. The Theoretical Model of the Problem

Whether or not a patient is diagnosed with IPV depends on a variety of patient,
clinician, institutional, and community factors (Figure A1). We included variables of interest in
our model if they had previously described associations with IPV [13, 47, 53, 81-83] or were logical
potential predictors of IPV diagnosis and were available to us through billing data, survey data,
hospital, or demographic/census data.

Patient-level predictors. Unmeasured patient factors may include level of fear of retaliation
for divulging abuse, trust in the ED practitioner, alternative opportunities to divulge IPV
outside the ED setting, and prior experiences disclosing abuse. Measured patient factors
include:

- Age. IPV occurs most often in younger women in their teens, twenties, and thirties.[2, 17] Age
  was reported as a mean, but to reflect the relative distribution of IPV, we also categorized
  patients by sub-groups of 18-33, 34-50 and 50-64. Patients 65 years or older were excluded
  to avoid overlap with elder abuse, a distinct clinical entity.

- Time of day, day of week. IPV has been observed to present to the ED disproportionately
  during off-hours – evenings, weekends – whether due to greater occurrence during these
  times,[84] occurrence with greater severity during these times, or because patients seek care in
  the ED as opposed to their primary care provider during these times.[46] Time of day was
  divided into traditional ED shifts: day (7 am to 2:59 pm), evening (3 pm to 10:59 pm) and
  overnight (11 pm to 6:59 am). Weekends included Saturdays and Sundays.

- Socioeconomic status (SES). SES, often measured by employment status, income, or housing type, has been associated with the incidence of IPV.[17, 50, 85] We did not have access to direct income or housing information, so instead used two estimates of SES: 1) insurance status and 2) zip-code based unemployment rate.

- Hospital disposition. Hospital disposition may indicate severity of injury[86] or the lack of housing options for women. Alternatively, patients who are admitted for injury may have IPV screening deferred until clinical stabilization or until evaluation by the inpatient social worker.

- Specific discharge diagnoses. Diagnoses were selected if they 1) they are likely to present to and be diagnosed in the ED setting (depression, as opposed to, for example, stuttering or nightmares) and 2) they have well-established associations with IPV and 3) they are specific enough that they might be expected to prompt suspicion of co-existing IPV. Both primary and secondary diagnosis fields were searched for presence of selected discharge diagnoses:

    - Injury diagnoses. Practitioners are more likely to screen for IPV in the presence of injury.[21] Injury presentations and specific injury patterns associated with IPV have been well described in the EM literature.[47, 48] Injury diagnoses were divided into injury type (eg, contusions, lacerations, fractures) and injury location (eg, head, neck, extremities); however, these detailed injury variables were ultimately dropped to simplify the model. ICD-9 codes for acute injury diagnoses are 800 – 904.99, 910 – 929.99, 940– 957.99, 959 – 959.99.

- Mental health. IPV is associated with a host of mental health problems,[87, 88] including

  post-traumatic stress disorder, depression, and depression with suicidality.

  Including a broader range of non-organic psychiatric diagnoses made sense for this

  investigation, as we wished to characterize not only conditions likely caused by IPV,

  but to assess the relationship of mental health problems to the diagnosis of IPV.

  Mental health problems may also affect the odds of IPV diagnosis by creating a

  barrier to screening and diagnosis. ICD-9 codes used for the "mental health"

  variable: 295 – 299, 299.1 – 299.99 (psychoses); 300.4, 301.12, 309.1, 311, 300 – 300.3,

  300.5 – 301.11, 301.13-301.99, 306 – 307.3, 307.5 – 307.59, 307.80, 307.82-307.89, 308.53-

  308.99, 309.2-309.99, 312-314.99 (non-psychotic mental disorders); V110, V111, V112,

  V118, V119 (history of mental health disorder). To avoid redundancy, mental health

  diagnoses related to substance abuse were excluded.

- Substance abuse. Substance use and IPV have a complex relationship. Alcohol and

  drug use in both the victim and the perpetrator have been implicated in the

  occurrence of acute IPV; in addition, substance abuse, like mental illness, is a long-

  term consequence of IPV.[29, 44, 50] While there is little data about IPV screening among

  patient with alcohol or drug problems, in theory, substance abuse has the potential

  to have mixed effects on IPV diagnoses. On the one hand, it increases the risk of

  violent injuries from IPV, and clinicians may be more likely to suspect IPV in

patients with substance abuse. However, acute intoxication or repeated visits may

create a barrier to communication and may lead practitioners to discredit histories of

IPV.

- Pregnancy-related diagnoses. Prevalence of IPV may increase during pregnancy [89]

  and is related to complications such as placental abruption, early labor, and low

  birth weight.[9, 90] The ICD-9 codes for pregnancy, labor and related complications

  were included; post-partum complications were excluded.

Because our outcome was the receipt of a formal ED diagnosis of IPV, and because many of

these variables have been associated with IPV for over a decade, a positive association between

the variables and the outcome may also represent the fact that practitioners are familiar with

more "classic" presentations and tend to identify abuse in patients that fit this picture. In other

words, there is the possibility that with such a prevalent condition, suspicion becomes a self-

fulfilling prophesy. Given our outcome (IPV diagnosis, not presence of IPV), adjusting for these

factors should correct for the extent to which differential rates of presentation of certain

problems to hospitals might affect the rates of IPV diagnosis. For example, certain hospitals

may serve communities with more trauma or substance abuse. We included these factors in the

model to adjust for the fact that practitioners might be more likely to ask about IPV in these

circumstances.

Perpetrator Factors. Perpetrator factors may play a role in the likelihood of an individual

patient to divulge IPV, including the nature of the abuse (for example, abuse may specifically

involve limiting access to health care providers), the explicit threat of retaliation in case of disclosure, the proximity of the perpetrator (for example, accompanying patient to the ED). These factors are not possible to measure in our study. There is no reason to suspect that these factors will occur differentially across hospitals. Related hospital-level factors would have been the level of privacy of the triage screening area or the practice of asking family members to step out of an examining room before interviewing a female patient.   These were not included in our survey.

Provider Factors. Clinician factors are difficult to measure and may account for some of the variability in our model. These would include individual clinicians' level of training and experience with IPV, knowledge of IPV prevalence, and fear of offending and alienating the patient. There is likely provider-to-provider variability within each institution; between-hospital variation seems less likely, as most hospitals have providers representing a range of backgrounds, experience levels, and personal histories that color their approach to IPV.

Institutional Factors. EDs may differ in IPV detection due to factors such as the number and quality of IPV resources available at the institution, the relationship with community IPV programs, and the institutional "culture" regarding IPV and its management. We were not able to take full measure of the extent to which EDs differ in their provision of IPV services. We were limited to information gained in our brief survey of ED administrators.

- Bed size. We used hospital bedsize as an indication of available resources, including personnel, subspecialization, and material resources.

- <u>Urban vs rural hospital.</u> Urban hospitals may have more programs addressing interpersonal violence in general. Urban hospitals also could be more likely to have relationships with community IPV programs.

- <u>IPV Policies and Services.</u> The main predictors of this study – the specific policies and services available for addressing IPV at each institution – were categorized dichotomously as "present" or "absent" unless noted otherwise.

  o <u>Mandatory screening.</u> The effectiveness of screening is controversial, and the USPSTF currently does not recommend for or against it due to insufficient information about its benefits and/or harms.[66] There is compelling logic for screening, including the value the information provides to the clinician about the patient's health[68] and the reason for the ED visit, and the rare opportunity to offer life-saving resources. While screening for IPV is a JCAHO mandate, information on the implementation of this policy is not available. We captured this variable in our survey with the question, "Is there an official policy in place that requires mandatory screening of all women for domestic violence in the ED?" We did not specify number of screening questions, type of screening tool used, or measures of adherence to the screening policy.

  o <u>Clinician education</u>. The lack of knowledge and skill of providers in identifying and addressing IPV has been well demonstrated.[24, 76, 78, 79] However, it is not clear whether training of providers should be a target

for improving IPV care, or if systems-level changes are a more effective

solution. Clinician training was gauged by the question, "Does the

hospital or ED provide regular, ongoing training on domestic violence for

nurses and/or doctors working in the ED?"

o   Public displays regarding IPV. The physical environment of the hospital

is considered an important component of a comprehensive hospital-based

IPV program; so-called "environmental orchestration," with posters or

brochures addressing IPV, is intended to make patients feel comfortable

divulging abuse, and to provide information and resources to patients in

a simple, cost-effective, and private way that does not rely on knowledge

or preparation of individual care providers.[72] There is limited

information on its effectiveness. We captured physical environment with

the question, "Are there posters and/or brochures on domestic violence

on public display in your ED?"

o   Intervention checklist. Protocols for the management of abuse were

explicitly mentioned in the recommendations by the family violence

workshop convened by Koop in 1985.[91] Yet in the subsequent years, such

tools have not come into commonplace usage, and their effectiveness has

not been established. We ascertained use of an intervention checklist in

the survey by asking, "Is there a standard intervention checklist for staff

to use/refer to when domestic violence victims are identified?"

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- o <u>On-site victim advocacy.</u> The role of victim advocate can be taken by a

  social worker or trained nurse, and may provide multiple resources,

  including safety assessment, assistance engaging law enforcement,

  placement in shelter or alternative housing, mental health crisis care, and

  referrals to primary care and IPV counseling. We did not find prior

  literature on the effectiveness of this resource in improving the

  identification of IPV in the ED. While many sites may refer patients to the

  care of an advocacy resource, we distinguished between on-site and off-

  site victim advocacy, hypothesizing that having such a resource

  immediately and physically available would be more likely influence

  practitioners' ability to identify and diagnose IPV. This resource was

  captured with the survey question, "Are on-site victim advocacy services

  for domestic violence provided in the ED?"

<u>Community Factors</u>. The community surrounding each hospital may influence a hospital's

ability to diagnose hospital through many ways, both obvious and subtle. Communities may

have varying levels of awareness of and activism around IPV. Again, our ability to capture this

information was limited to characterizing the hospital service area as urban or rural.

Figure A1. The Theoretical Model of the Problem*
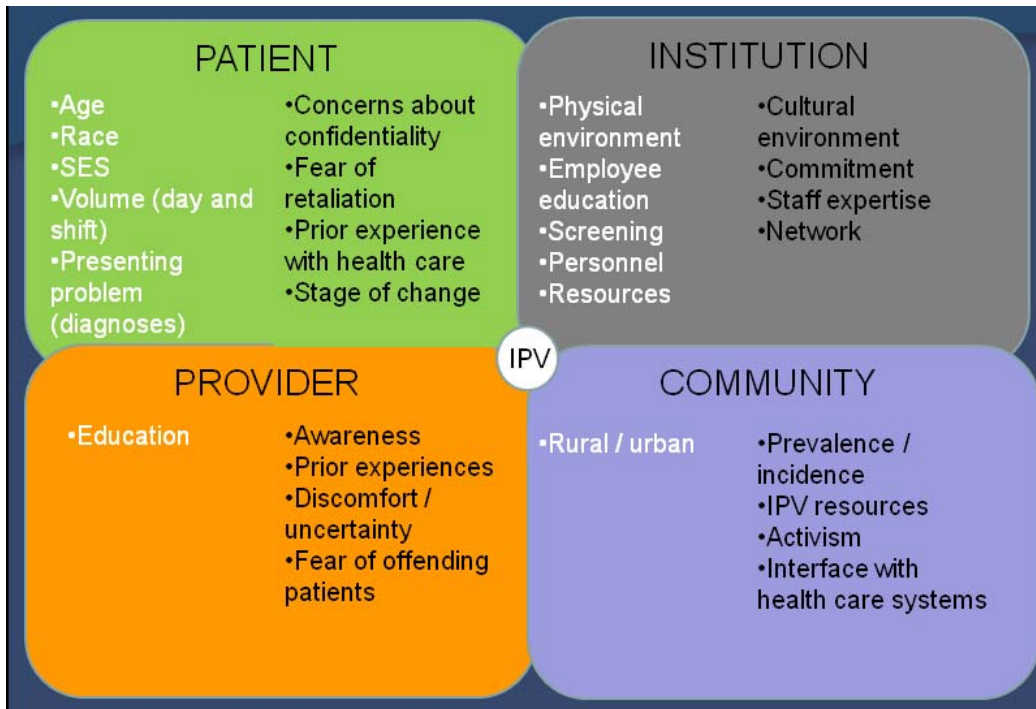
*White font indicates factors that were available to us and represented by variables in our model. Black font indicates potentially influential variables that were not able to be included in our model.

Appendix B. Characteristics of the five participating hospitals excluded from the study.

Four hospitals, representing one hospital system, were only able to provide data beginning in 2002 and were excluded from the sample. An additional hospital was excluded because it closed after collection of billing data so we were not able to obtain survey information regarding hospital policies and services. Characteristics of these hospitals are shown in Table B.

Table B: Characteristics of 5 hospitals dropped from the study dataset

Bedsize (mean/median)	57 / 49
Level 1 Trauma centers N(%)	0
Level 2 Trauma centers N(%)	0
Level 3 Trauma centers N(%)	4 (80%)
Level 4 Trauma centers N(%)	1 (20%)
Urban hospitals N(%)	0
Critical access hospitals N(%)	2 (40%)

<p style="text-align:center;">**Appendix C.** Sensitivity analysis for uncertain survey data.</p>

ED administrators at 8 of 21 hospitals (38%) expressed uncertainty about when policies or

services had been initiated. In total, 12 out of 126 survey data points (10%) requiring knowledge

of approximate date of implementation were entered as "I don't know." We performed two

sensitivity analyses to test the consistency of our results with a variety of potential true values for

these data points. Results are shown in Table C.

Table C. Sensitivity analyses: multivariable logistic regression models for IPV diagnosis A) including only policies and services for which administrators were certain that date of initiation was before or during the study period and B) assuming that policies and services for which administrators were uncertain of date of initiation were absent during the study period

IPV Policy or Service	Primary analysis (if uncertain, considered present) OR (95% CI)	A) Certainty of dates only OR (95% CI)	B) If uncertain, considered absent OR (95% CI)
Mandatory screening policy	1.13 (0.52-2.42)	0.69 (0.25-1.93)	0.38 (0.20-0.73)
Regular clinician training	1.16 (0.70-1.93)	2.41 (1.15-5.07)	3.27 (1.74-6.17)
Public displays regarding IPV	0.55 (0.37-0.83)	0.19 (0.07-0.50)	0.15 (0.05-0.43)
Standard intervention checklist	1.79 (1.13-2.85)	4.78(1.76-12.97)	5.93 (2.14-16.43)

On-site victim advocacy services
    Part-time
    Full-time
    Any
	
	1.73 (0.73-4.06)
	1.79 (0.63- 5.06)
	1.73 (0.74-4.03
		
		4.14 (1.23-13.86)
		2.50 (0.85- 7.34)
		2.77 (1.07-7.22)
			
			7.63 (2.97-19.63)
			4.47 (2.13- 9.37)
			2.76 (1.32-5.76)

Appendix D. Missing data and multiple imputation models.

We performed a sensitivity analysis to test the robustness of the results compared to a sample

with a random pattern of missing data. We created a hypothetical data set with complete data

(ie, no missing values), identical sample size, and the same variables. The hypothetical dataset

produced similar ORs and confidence intervals in the logistic regression model as the original

analysis. There is no way of knowing the true underlying pattern of missingness in our study

dataset (Figure D1). For the sensitivity analysis, we used a missing completely at random

(MCAR) pattern, representing a simple random sample of missing values for each variable;

however, patterns of data were created such that each variable was missing the same amount of

data as in the original data set. The results obtained were similar to those in the original analysis

(Table D1).

Figure D1: Patterns of missing data in the study dataset. Shaded cells represent missing values.
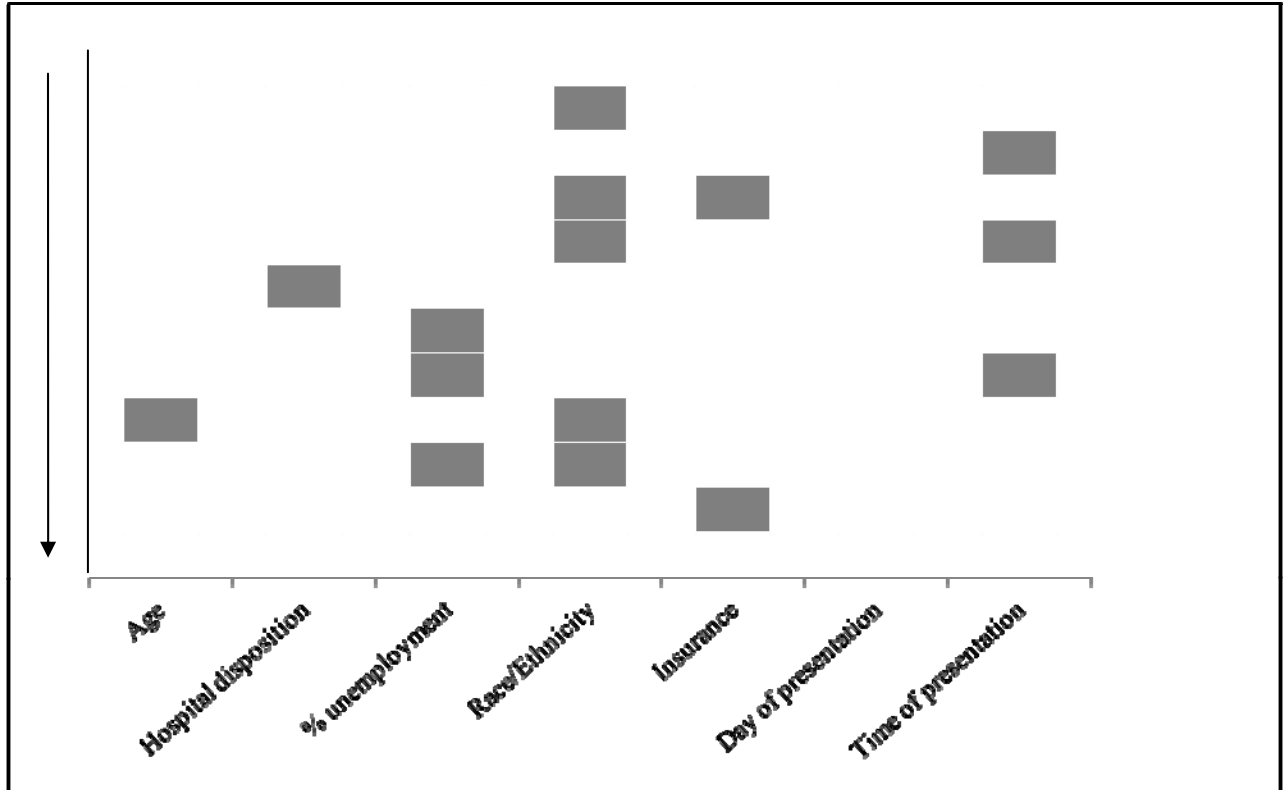
Table D1. Sensitivity analysis: Results of multiple imputation simulation. Multivariable logistic regression model for diagnosis of IPV using random pattern of missing data.

Patient & hospital factors	Complete dataset (no missing values) used in the primary analysis OR (95% CI)	Data missing completely at random OR (95% CI)
Age		
18-33	Reference	Reference
34-49	0.94 (0.84-1.05)	0.94 (0.84-1.05)
50-64	0.33 (0.28-0.39)	0.33 (0.28-0.39)
Race/Ethnicity		
Asian	1.29 (0.55-3.01)	1.74 (0.96-3.15)
Black	1.57 (1.17-2.11)	1.83 (1.46-2.30)
Hispanic	1.01 (0.77- 1.55)	0.94 (0.70- 1.25)
Native American	1.83 (1.01-3.36)	2.54 (2.19-2.93)
White	Reference	Reference
Other	1.44 (0.90- 2.31)	0.94 (0.65- 1.37)
Insurance status		
Commercial	Reference	Reference
Medicaid	2.55 (2.21-2.95)	2.54 (2.20-2.93)
Medicare	1.44 (1.12-1.85)	1.43 (1.10-1.84)
Uninsured	2.43 (2.16-2.74)	2.46 (2.18-2.78)
Other	0.25 (0.15-0.41)	0.25 (0.15-0.41)
Percent unemployment		
<5.96%	Reference	Reference
≥5.96%	1.06 (0.89- 1.27)	1.06 (0.88- 1.27)
Day of presentation		
Weekday	Reference	Reference
Weekend	1.05 (0.99- 1.12)	1.05 (0.99- 1.12)
Shift of presentation		
Day shift	Reference	Reference
Evening shift	1.05 (0.92-1.20)	1.11 (0.96-1.28)
Night shift	2.21 (1.83-2.69)	2.21 (1.88-2.77)
Selected discharge diagnoses		
Injury	33.13 (24.25-45.26)	33.07 (24.20-45.19)
Mental health	1.61 (1.29-2.01)	1.62 (1.29-2.02)
Alcohol related	2.30 (1.86 -2.85)	2.33 (1.90 -2.88)
Drug related	0.81 (0.57-1.17)	0.81 (0.57-1.15)
Pregnancy related	1.49 (1.20-1.86)	1.52 (1.22-1.90)
Inpatient bed size (per 10-bed increase)	0.99 (0.96-1.02)	0.99 (0.97-1.02)

Practice setting		
Rural	0.97 (0.39-2.44)	0.98 (0.39-2.74)
Urban	Reference	Reference
Mandatory screening policy	1.13 (0.52-2.42)	1.12 (0.52-2.38)
Regular clinician training	1.16 (0.70-1.93)	1.15 (0.69-1.93)
Public displays regarding IPV	0.55 (0.37-0.83)	0.55 (0.37-0.83)
Standard intervention checklist	1.79 (1.13-2.85)	1.79 (1.12-2.86)
On-site victim advocacy services		
Part-time	1.73 (0.73-4.06)	1.74 (0.75-4.07)
Full-time	1.79 (0.63- 5.06)	1.79 (0.63- 5.09)
Either part-time or full- time	1.73 (0.74-4.03)	1.75 (0.76-4.04)