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Understanding the Barriers of Violence Victims' Health Care Use

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Abstract

In the U.S., violence is a leading cause of death among adults under age 45 and there are 3.3 million living violence victims, but most victims forgo formal health care when injured. We develop and test a framework to understand why. We argue that violence victims' health care decisions cannot be understood without considering their need for care and barriers for care-seeking that arise from three situational factors of victimization: victim-offender relationships, victimization history, and sexual (versus non-sexual) victimization. In analysis of 9,912 violent victimizations from 8,635 participants in the 1993-2017 National Crime Victimization Survey, we find that injury severity and situational factors of victimization independently and interactively predict formal health care use. Even when serious injury occurs, victimizations involving known offenders, repeat victimizations, and sexual violence are less likely to result in formal health care use. We discuss the implications of these findings for victims and health care providers.

Understanding the Barriers of Violence Victims' Health Care Use

In the U.S., violence is a serious health concern that is in the top 5 leading causes of death for people under age 45 (Centers for Disease Control and Prevention, 2018). In 2018, a National Crime Victimization Survey (NCVS) report indicated that 3.3 million Americans reported being victims of violence, a number that had increased for men and women and in most adult age groups since 2015 (Oudekerk and Morgan, 2018). For injured victims who survive their attack, one-fifth experience serious injuries (Truman and Morgan, 2014) and their victimization often comes at the hands of known attackers or as part of repeated attacks (Lauritsen et al. 2016). In addition to causing physical trauma, violence also causes serious psychological trauma and distress (Hodges and Perry 1999).

The use of formal health care services has critical benefits for violence victims. The obvious benefits are decreased odds of physical complications, re-injury, and death due to injuries (Gallagher 2005; Shackelford et al. 2017). Medical treatment also offers victims other benefits including referrals to social and mental health services (Wolff et al. 2017), formal documentations of injuries that are admissible in court proceedings (Shaw and Campbell 2013), and an avenue for police intervention due to mandatory reporting laws (Schleiter 2009)[1].

Despite the help that violence victims can receive from formal health services, only half of victims who need health care use it (Tjaden and Thoennes 2000; Truman and Morgan 2014). The present study seeks to understand why. We develop and test a framework that draws from medical sociology, criminology, and other fields to acknowledge the tension that violence victims face as they consider using formal health services. On the one hand, medical treatment produces benefits for violence victims who need care due to injury. Yet these benefits must be weighed against the possible risk of further physical, psychological, and social harm that may

arise if victims have an ongoing relationship with the offender, are victims of repeated attacks, or are victims of sexual violence. Criminologists refer to these aspects of victimization as "situational factors" of crimes (Felson and Steadman 1983; Rennison 2010). They can produce tangible (e.g., physical harm) and intangible barriers (e.g., psychological or social harm) to seeking formal health services (Champion and Skinner, 2008).

Our framework therefore recognizes that need for care (i.e., injury severity), which is central to most models of health care use (Andersen 2008; Champion et al. 2008), and barriers for care-seeking that arise due to situational factors of victimization are both important to victims' health care decisions. We argue that they will predict formal health care use independently and through interactions between situational factors of crime and injury severity.

Our study's test of this framework makes three research contributions. First, our study shows whether social relationships reduce health care use among violence victims. In general, supportive and positive social relationships are associated with better health outcomes (Berkman and Syme 1979; House, Landis, and Umberson 1988; Rendall et al. 2011) and an increased likelihood of health care use (Cohen 2004). Yet social relationships can also have a "dark side" for health (see Umberson and Mondez 2010 for review). In the case of violence victims, their relationships with intimate partners and family members likely take this concept to extremes due to social pressure to keep the incident private and threats of physical retaliation from the offender. Second, study results will show whether victims may avoid health care services to—paradoxically—avoid harm. Specifically, we argue that fear of revictimization and secondary traumatization prevent repeat violence victims and sexual violence victims from using health care (Felson et al. 2002; Patterson, Greeson, and Campbell 2009). Third, our study shows whether situational factors of victimization (i.e., knowing the offender, being repeatedly

victimized, and being sexually assaulted) even lead seriously injured victims to ignore their medical needs. Examining these issues is critical for understanding the precarious position of violence victims who are deciding to use health care.

We test the utility of our framework in analyses that estimate violence victims' use of formal health care (e.g., hospitals, emergency rooms, and clinics) using 25 years of violent victimization cases collected by the NCVS (1993-2017). To our knowledge, this is the largest dataset that includes detailed information about both the experience of victimization and victims' healthcare decisions after the crime. Our findings suggest that examining the health care use of vulnerable patient populations who have reasons to fear interacting with medical institutions require frameworks that take their unique circumstances into account.

BACKGROUND

Behavioral models of health care utilization place need for care as a central consideration for patients' health care decisions (Andersen 2008; Rosenstock, Strecher, and Becker 1988). However, violence victims' decisions to seek health care services are, in many ways, different from the general population. Violence victims must weigh their need for care against the risk of additional harm or repeated trauma they may face if they seek care. Even in the wake of serious violence injuries, victims may avoid care providers if they fear health care services may do more harm than good.

Criminologists and psychologists argue that situational factors of victimization can deter victims from reporting to the police (e.g., McCart, Smith, and Sawyer 2010; Xie and Baumer 2019). Knowing the attacker (Kaukinen, 2002), repeated victimization (Peterson and Seligman 1983), and sexual violence (Morgan and Oudekerk, 2018) all reduce the odds of reporting. We argue that these situational factors will also act as barriers that prevent victims from seeking

health care. This argument is in line with a rich research tradition in medical sociology that demonstrates the complex process underlying individuals' decisions to use formal physical and mental health care services (e.g., Aneshensel et al. 2019; Boyer and Luftey 2010; Champion and Skinner, 2008; Fussell et al. 2018; Pescosolido 1992)

Relationship to the offender

Social relationships and networks influence health (Berkman and Syme 1979; House et al. 1988; Umberson and Karas Montez 2010) and health care decisions (Iwashyna and Christakis 2003). Most studies focus on the benefits of social relationships and networks. Living with family members—such as parents and spouses—is positively associated with health (Rendall et al. 2011) and health care use (Reczek et al. 2018). These positive associations, though, are predicated on relationship quality. Low quality and stressful relationships do not confer the same advantages as high quality and supportive relationships, and they can also be deleterious to people's health and discourage health care use (Allendorf 2010; Umberson et al. 2006; Umberson and Karas Montez 2010; Stafford et al. 2018; Wilson et al. 2019).

Injuries that crime victims receive at the hands of partners and family members signal low quality and abusive relationships. These negative relationships produce tension in the victim-decision making process that prevents victims from formally seeking help, which increases victims' reliance on informal sources of support (Kaukinen 2002). This tension stems from two sources.

The first source of tension arises from victims' potential desire to protect their relationship. Among victims who love or care for the person who hurt them, obtaining medical care risks disclosing the victimization to the public. This may lead care providers, friends, and family members to negatively judge victims for maintaining an abusive relationship and pressure

victims to end the relationship (Overstreet and Quinn 2013). Victims who wish to avoid public stigma and maintain their relationships with family or intimates may avoid seeking care altogether.

Tension also stems from the fact that medical care is associated with a higher likelihood of police involvement and the offender's arrest (Rennison, 2002). This is problematic for those who wish to protect the offender and victims of intimate partner and family violence who fear retaliation by their offender. Both of these factors impede seeking help from police (Felson et al. 2002). Avoiding the health care system helps to accomplish this goal.

Repeat victimization.

Victims who have been previously attacked may also avoid seeking formal health care because they fear retaliation and revictimization. Indeed, repeated victimization often comes at the hands of offenders who victims must face again—intimate partners, family members, and workplace acquaintances (Lauritsen et al., 2016; Oudekerk and Truman, 2017). Prior victimization may lead victims to be more likely than those with no victimization history to anticipate retaliation from an offender for disclosing the incident to the public, especially if care-seeking leads to a police report.

Victims who have been previously attacked also frequently engage in self-blame (Miller and Porter 1983) and may perceive that medical services (or any kind of outside help) will not prevent revictimization (Walker 2016). This perception is most likely to occur when a victim attributes the violence to factors that are internal ("I was attacked because I'm careless"), stable over time ("I am always careless"), and global in their effects ("Bad things always happen to me because I'm careless") (Peterson & Seligman, 1983). In short, repeated victimization may lead

individuals to see little benefit in using medical services that cannot address the perceived root causes of their victimizations.

Sexual violence.

Individuals victimized by sexual violence may avoid seeking medical care because they wish to prevent secondary victimization (Patterson, Greeson, and Campbell, 2009), or the negative reactions and ramifications of interacting with family, friends, police, and health care providers after a crime (Campbell et al. 2001; Williams 1984). The stigmatizing attitudes of medical care providers have specifically been documented as a factor that reduces sexual violence victims' comprehensive care (Campbell 2008; Overstreet and Quinn 2013).

The treatment process itself is also a potential source of secondary victimization (Campbell, 2008). If sexual violence victims seek care, emergency treatment involves long waits that require victims to forgo eating, drinking, and urinating to maintain physical evidence (Taylor 2002, cf. Campbell 2008). Seeing a physician then requires invasive exams that may cause victims to re-live their sexual assault, as exams involve "plucking head and pubic hairs; collecting loose hair by combing the head and pubis; swabbing the vagina, rectum, and/or mouth to collect semen, blood or saliva" (Campbell, 2008: 706). The invasiveness of these exams can be compounded when victims perceive that care providers—some with only minimal training or experience in giving forensic exams—are rude or callous during the procedure (Campbell 2005). When weighing the potential benefits of services with the cost of secondary victimization, violence victims who expect such treatment may understandably avoid medical care.

The Current Study.

Figure 1 depicts the study's framework regarding violence victims' use of formal health care services. Each of the three situational features of crime—victim-offender relationship,

repeat victimization, and sexual violence—are conceptualized as barriers to health care use. This leads to three research expectations. First, victims who are attacked by people they know will be less likely than those attacked by strangers to use health care. Second, repeat violent victimizations are less likely than first incidents of violence to result in formal health care use. Third, sexual violence will be less likely than non-sexual violence to result in formal health care use.

Figure 1 about here

In line with behavioral models of health care use, perceived need (i.e., injury severity) is also central to our framework (Andersen 1995, 2008). We expect need to have a positive relationship to formal health care use. Nonetheless, we also argue that each of the situational factors of victimization depicted in Figure 1 produce tension between the need for care and the negative ramifications of care-seeking described above. These negative ramifications may lead victims to ignore their need for medical care when they are deciding to use health services. Accordingly, we expect that situational factors of victimization will each weaken the relationship between injury severity and formal health care use.

Figure 1 also depicts study control variables. We account for them to better isolate how situational factors of crime and injury severity independently and jointly predict formal health care use. Some control variables were selected because of criminological research that recognizes that offender characteristics and the location of victimization are related to reporting to the police (Hullenaar and Ruback 2020; Xie and Baumer 2019) and general help-seeking (Goudriaan 2006), but the majority of confounders were selected by drawing from behavioral models of health care use (Andersen, 1995), which has been used extensively by health services researchers (see Babitsch, Gohl, and von Lengerke 2012 for a review).[2] As noted above, need for

care is central to this model. It also addresses factors that enable care (i.e., health insurance, income) and predispose individuals to need care and have resources to seek it (Andersen, 2008). Predisposing factors include sociodemographic characteristics such as age, gender, race/ethnicity and education level.

DATA AND METHODS

Data

We examined violence victims' health care decisions using a sample of violent victimizations involving injury collected by the NCVS from 1993 to 2017. The NCVS is a nationally representative dataset of households in the United States, and it is the leading national source of self-report victimization data on people 12 years old or older. The NCVS is ongoing and follows up with the households at six-month intervals for three and a half years after they are initially contacted. From 1993 to 2017, the NCVS recorded a total of 53,822 violent victimizations, including assaults, robberies, and sexual victimizations (i.e., rape and sexual assault), against 41,854 U.S. individuals. The NCVS does not measure homicide victimization.

For conceptual reasons, we restricted the sample in three ways. First, we excluded 10,872 violent victimizations against persons 12 to 17 from the study because, compared to adults, youth typically have less autonomy regarding their health care decisions. The health care use of youths may also be distinct because they are typically attacked at school (Musu et al., 2019), where violence is less likely to be hidden and victims are more easily treated by on-site medical staff (e.g., school nurses). Second, we excluded 32,225 violent victimizations where the victim did not sustain an injury because there was no need for formal health care services. Third, we excluded 813 violent victimizations where NCVS interviewers classified a victim's injury as only some "other" injury, as there was no indication of injury severity, our measure of health care need. In

sensitivity analyses, we found that our results were robust to including "other injury" as a separate injury category. Our final sample of victimizations includes 9,912 cases from 8,635 adults ages 18 or older. This sample represents 18.4% of violent victimizations collected by the NCVS from 1993 to 2017.

We used multiple imputation with chained equations (MICE) to handle missing data. MICE is a set of linear and general linear models that substitute missing data values for plausible values using the observed data and an iterative stochastic approach. For any given missing value, we estimated 20 plausible values. We included all variables from the analysis in the imputation process.

Most missing data are due to three variables. Health insurance coverage accounted for the vast majority of missing data (55.6% missing) because the NCVS does not collect insurance information for victims who received no care (54.0% of the sample). An underlying assumption of multiple imputation is that the data are conditionally missing at random. In other words, the probability of missing data should be statistically random conditional on the observed data. Given that the missingness of insurance was primarily attributed to victim's receiving no care, we accounted for this in our imputation model. Additionally, our models also include measures of the victim's household income, employment status, age, and race/ethnicity, which are all important indicators of health insurance coverage that also predict formal health care use. Our rationale for including health insurance in the analysis is that it is a central predictor of health care use and excluding cases missing this information dramatically biases the sample. Furthermore, health insurance use is only used as control variable and in models that we estimated without the imputed health insurance variable, study results did not change (results from these supplementary analyses are available upon request).

Two other variables with substantial missing data were region (20.4% missing) and household income (14.8% missing), which is very frequently not reported by survey respondents. Missing data on region is the result of the NCVS design. It did not include data on region of the victim's household until 1995.

Measures

Formal health care use is the primary study outcome (1= yes). This measure is based on reports about whether victims received any medical care after the crime, and if so, where care was received.[3] Formal care indicates that the victim was treated in a medical setting (i.e., a doctor's office, medical clinic, emergency room, or hospital). Most victimizations receiving formal care were treated in an emergency room (72.5%). In 1.1% of cases, victims indicated that they received care only in some "other location," with no other description provided. Our results were virtually identical when we coded these cases as formal care and then as informal care. We treat "other location" as informal care.

Injury severity is an indicator of medical need.[4] Based on a report published by the Bureau of Justice Statistics (BJS; Truman & Morgan, 2014), we coded injury severity into two categories. Serious injuries (=1) include gunshot wounds, knife wounds, internal injuries, unconsciousness, broken bones/teeth, or injuries resulting from a rape or sexual assault. Minor injuries (=0) include bruises, black eyes, cuts, scratches, swelling, and chipped teeth.

The three situational factors representing barriers to health care use are the victim-offender relationship, repeat victimization, and whether the victimization was sexual violence. Victim-offender relationship was coded into four categories: stranger (reference category), acquaintance, family member, and intimate partner, which includes spouses, ex-spouses, boyfriends/girlfriends, and ex-boyfriends/ex-girlfriends. For victimizations involving multiple

offenders, this variable was coded according to the offender with the closest relationship to the victim. Intimate partners are closer than family members, family members are closer than acquaintances, and acquaintances are closer than strangers. Multiple-offender victimizations rarely involved family members or intimates (< 1% of cases), but as a robustness check, we coded family members as being closer than intimate partners and found that our results did not substantively change.

Repeat victimization is a dichotomous measure that indicates whether the victim was similarly attacked prior to the victimization they reported to the NCVS (1 = yes). The NCVS asks respondents whether their reported violent victimization occurred multiple times in the past 6 months. This measure therefore indicates a pattern of repeat violence only. Prior non-violent victimizations do not contribute to the operationalization of repeat victimization.

Sexual violence (1=yes) indicates that the reported victimization was a rape, sexual assault, or attempted rape/sexual assault. We used crime classifications in the NCVS data to distinguish between sexual violence and non-sexual violence (i.e., non-sexual assault and robbery).

Control variables included predisposing and enabling factors of health care use. Predisposing factors included sociodemographic measures that predict health care resources and need[5] (Babitsch et al. 2012): victim's age (continuous), gender (1 = female), race/ethnicity (Hispanic, non-Hispanic Black, non-Hispanic other race, and non-Hispanic White [reference]), education level (bachelor's degree or higher, at least some college, high school degree, less than high school degree [reference]), marital status (1 = married), household size (continuous), and the number of years the victim resided in their current household (continuous).

Enabling factors included indicators of the victim's health care resources: the victim's health insurance coverage (1 = yes), income (continuous, adjusted to represent 2015 dollars), employment status (1 = employed), home ownership (1 = yes), vehicle ownership (3 or more vehicles, 1 to 2 vehicles, and no vehicles [reference]), and the urbanicity of the victim's household (urban, suburban, rural [reference]).

Other controls include the region of the victim's household (West, South, Midwest, and Northeast [reference]), the offender(s) sex (all female, mixed sex group, all male [reference]) whether the victimization occurred at a private residence (1= yes), whether there were multiple offenders (1= yes), and whether there was a third party besides the victim and offender(s) present during the incident (1= yes).

Analytic Strategy

Table 1 first presents descriptive statistics. It shows the percentage of all victimizations in the study that involved use of formal health care; the percentages of victimizations involving strangers, acquaintances, family members and intimate partners; the percentage of repeat victimizations; and the percentage of sexual violence victimizations. The percentage of victimizations involving serious injuries is also included in Table 1.

We then describe the bivariate relationship between our independent variables and formal health care use in Table 2. These estimates show what percentages of victimizations involving strangers, acquaintances, family members, and intimate partners do result in formal health care use. We also show what percentages of repeat victimizations, sexual violence victimizations, and victimizations involving serious injury result in formal health care use.

We then turn to multivariate analyses. We used logistic regression models to estimate how situational factors of victimization and injury severity are related to the odds of formal

health care use without (Model 1) and with (Model 2) other control variables. Estimates from these models are shown in Table 3. We used survey weights to account for unit non-response and clustered the standard errors on the victim's identification number to account for victims having multiple victimization records (for weighting procedures, see Shook-Sa, Couzens, & Berzofsky, 2014).

We estimated three additional logistic regression models that included all variables in Model 2 and interaction terms (i.e., product terms) between injury severity and the situational factors of the crime. Recent research regarding interaction effects in non-linear models (e.g., logistic regression) suggests that interaction coefficients (even when including their constituent terms in the model) do not necessarily capture the significance, magnitude, and direction of underlying interaction effects (Mize, 2019).[6] Thus, we used the estimates from the interaction models to generate predicted probabilities that tested (a) the effects of situational factors on formal care use for victims with serious injuries and (b) whether situational factors moderated the effect of serious injury on victims' use of formal care. We used pairwise comparisons to test for differences between our estimates at the 95% confidence level.

RESULTS

Descriptive Results

Table 1 summarizes selected descriptive statistics about health care use, situational experiences of victimization, and injury severity for the total sample of violent victimizations involving injury.[7] Only 26.3% of victimizations resulted in formal health care use. Estimates of victims' relationship to their offender indicate that 38.7% of victimizations involved a stranger and 25.2% involved an acquaintance. Family members and intimate partners composed 8.5% and 27.7% of offenders, respectively. Repeat victimization composed 18.5% of violent victimizations

in the study, and sexual violence composed 9.8% of victimizations. Approximately one-fourth of victims reported a serious injury (24.5%).

*** Table 1 about here ***

Table 2 describes the bivariate relationship between both the situational factors of crime and injury severity to victims' health care use. In general, victimizations that result from offenders with closer relationships to the victims were less likely to result in formal health care use. Among victimizations involving strangers, 33.2% resulted in formal health care use. Comparatively, formal health care use was reported by 25.2%, 22.2%, and 18.8% of victimizations involving acquaintances, family members and intimate partners, respectively. Repeat victimizations were less likely than non-repeat victimizations to involve formal health care use (13.4% vs. 29.2%). Formal care use was slightly less likely when the violent victimization was sexual rather than non-sexual (22.8% vs. 26.7%). Finally, victimizations resulting in serious injuries were far more likely than victimizations with minor injuries to involve formal care (54.2% vs. 17.3%).

Table 2 about here

Injury Severity, Situational Factors of Crime, and Violence Victims' Health Care Use

Table 3 summarizes the results from logistic regression models estimating injured violence victims' formal health care use. In Model 1 (without controls), all three situational factors were significantly related to formal health care use. Regarding the victim-offender relationship, the estimated odds of using formal care were significantly lower for victimizations involving acquaintance violence ($OR = 0.728$, $p < 0.001$), family violence ($OR = 0.702$, $p < 0.01$), and intimate partner violence ($OR = 0.636$, $p < 0.001$) relative to stranger violence. The estimated odds of formal heath care use were also reduced by 51.1% ((1-($OR = 0.489$), $p <$

0.001)) in incidents involving repeat versus non-repeat victimizations and by 83.9% ((1-(*OR* = 0.161), $p < 0.001$)) in incidents of sexual versus non-sexual violence. We also found a large, statistically significant estimated effect of serious injuries on formal health care use (*OR* = 10.951, $p < 0.001$). When we adjust Model 1 results for confounders (see Model 2), estimated results were not substantively or statistically different in magnitude.[8]

Table 3 about here

We next show how situational factors were related to formal health care use in victimizations involving serious injury using predicted probabilities that we generated using the estimates from the interaction models shown in Appendix C.[9] The estimated effects of situational factors on formal care use were robust even when victimizations involved serious injury. At a 95% confidence level, there was a significantly lower predicted probability of formal health care use when serious injuries were caused by intimate partners (Pr(formal care) = 0.557) than acquaintances (Pr(formal care) = 0.626) and strangers (Pr(formal care) = 0.693). Additionally, there was a significantly higher predicted probably of formal health care use when victims were seriously injured by strangers versus acquaintances. There were also significantly lower predicted probabilities of formal health care use when serious injuries were the result of repeat victimization (Pr(formal care) = 0.482) versus non-repeat victimization (Pr(formal care) = 0.668). The differences in the predicted probabilities of formal health care use when serious injuries result from sexual and non-sexual violence are more striking. The latter group has more than double the probability of formal health care use (Pr(formal care) = 0.686 versus Pr(formal care) = 0.253).

Figure 2 about here

Finally, Figure 3 presents tests of whether the estimated effect of serious injury (vs. minor injury) on the probability of formal care use (i.e., Δ_{injury}) differed across relationship (panel A), repeat victimization (panel B), and sexual violence (panel C) categories. We discuss only pairwise comparisons in each panel of estimated effects that indicated a significant difference at the 95% confidence level.

Figure 3 about here

The estimated effect of serious injury on victims' use of formal care was weaker for victimizations involving intimate partners than victimizations involving strangers. Sustaining a serious injury increased the predicted probability that victims of intimate partners used formal care by only 41.6 percentage points. By contrast, a serious injury increased the probability that victims of stranger violence used formal care by 50.6 percentage points.

The estimated effect of serious injury on formal care use was also weaker for repeat victimizations than non-repeat victimizations. For repeat victimizations, sustaining a serious injury increased the probability of formal care use by only 37.9 percentage points, whereas for non-repeat victimizations, sustaining a serious injury increased the probability of formal care use by 49.2.

Regarding sexual violence, the estimated effect of serious injury was weaker for sexual versus non-sexual violence victimizations. Sustaining a serious injury had almost no estimated effect of using of formal care after sexual violence victimizations ($\Delta_{injury} = 0.056$, $p > 0.05$). By contrast, sustaining a serious injury increased the probability of formal care use by 48.6 percentage points after non-sexual violence victimizations.

We conducted sensitivity analyses to determine whether the interaction between injury severity and sexual violence was due to sexual violence injuries being coded into the serious

injury category. When we removed cases where sexual violence victims were classified as having a serious injury because they reported only sexual violence injuries ($n = 560$), the magnitude of our results changed, but the conclusions remained the same. We found that having a serious injury increased the probability of formal care use after sexual violence victimization by 16.2 percentage points. However, pairwise comparisons suggested that the estimated effect of serious injury on the probability that a victim used formal care was still significantly stronger ($p < 0.05$) for victims of non-sexual violence ($\Delta_{injury} = 0.512$) than victims of sexual violence ($\Delta_{injury} = 0.162$).

DISCUSSION

This study developed and tested a framework to better understand violence victims' use of formal health care. It combined insights from multiple fields of study including medical sociology and criminology. We argued that victims' health care decisions are complicated by a tension between their need for care and the barriers to care that results from situational factors of violence victimization—namely the victim-offender relationship, repeat victimization, and sexual violence victimization. We expected to find that the severity of victims' injuries and these situational factors would independently and jointly be related to formal health care use.

Our research expectations were largely supported. In general, victim-offender relationship, repeat victimization, and sexual violence were all related to formal health care use. Even among victimizations involving serious injury to the victim, these situational factors significantly changed the probability of formal health care use. Consistent with prior research (Resnick et al., 2000), injury severity generally increased the likelihood that a victim used formal care, but the magnitude of this estimated effect further depended on the situational factors of victimization. More specifically, injury severity had a significantly weaker effect on formal care

use when victimizations involved intimate partners rather than strangers. Injury severity also mattered less when the victimization was a repeated attack. Out of all situational factors, however, sexual violence had the strongest moderating effect on injury severity.

Our findings regarding victim-offender relationship provide further evidence for what Umberson and Montez (2010) refer to as the "dark side" of social relationships. Even when violence is severe, attacks by acquaintances, family members, and intimate partners are significantly less likely than attacks by strangers to be treated in a formal health care setting. Attacks by individuals that victims know likely serve as barriers to formal health care use because they require victims who seek services to risk revealing this violence—and possibly abuse—to important people in their lives and health care providers. After learning about the abusive relationship, family, friends, and care providers may stigmatize them for continuing the relationship and push them to break their tie to the offender (Overstreet and Quinn, 2013). Seeking formal care also risks police involvement (Rennison, 2002), especially when injuries are serious. Victims may thus avoid care because they fear retaliation for reporting the crime to the police (Waalen et al. 2000).

Associations between victim-offender relationship and formal health care use are troubling. It is concerning that seriously injured victims are more likely to avoid care when the offender is someone they know well and are likely to see again. It is also alarming that—compared to the health care decisions of victims of stranger violence—the health care decisions of IPV victims are less affected by their medical need. This finding implies that these victims are more likely to ignore their medical need because their relationship to the offender presents a serious barrier to care.

In this regard, health care providers face a difficult ethical dilemma. Health care institutions are beholden to laws that compel providers to report violence to the police, which can help victims terminate abusive relationships and even prevent revictimization (Xie et al., 2006). While these laws aim to keep victims safe, they may also be a serious health care impediment for victims who care, fear, or depend on the offender. Wary of an undesirable outcome, victims may be hesitant to yield control over their situation to a health care provider.

There is no immediate solution to this dilemma, but we encourage providers to think critically about their patients' situations and communicate potential options to them *before* reporting to the police. Victims who perceive greater agency in a health care setting may be more willing to see a provider. Providers can further encourage this agency by giving victims a variety of medical, legal, and social services options or referrals, giving victims more control over their options, and being supportive of victims' decisions (Dienemann, Glass, and Hyman, 2005). If victims learn to see health care as an enabling resource, instead of an institution that restricts their options, they may be more willing to seek care.

Repeat victimizations were associated with lower odds of formal health care use and lower probabilities of care. This finding is consistent with the expectation that repeat victims avoid health care services because they either fear retaliation or do not view health care services as particularly helpful for preventing revictimization (Walker, 1979). We also found that injury severity had a weaker influence on repeat victims' than non-repeat victims' health care decisions suggesting that repeat victims deal with physical and psychological barriers that prevent them from seeking medical care even when they need it.

Repeat victimization has serious consequences for individuals' personal and social development (Macmillan 2001). These problems may be compounded when victims are unable

to receive necessary services to treat their injuries and potentially prevent revictimizations. For some, repeat victimization is chronic, and without intervention, direct exposure to violence may become a routine aspect of their life.

Our study findings about repeat victimization conflict with the idea that repeat victims of violence develop a survivor mentality that leads them to seek help more often (Gondolf, 1990; Gondolf and Fisher, 1988). One reason why our findings differ may be due to the tendency of the literature to focus on the victim and not victimizations. Analyzing victims (and not victimizations) has a serious limitation, in that repeat victims may be more likely to seek help because they have more opportunities to do so (i.e., they experience more victimizations). Our analyses revealed that, given any violent victimization, a victim who was repeatedly attacked is less likely to use formal health care. Further research should more directly examine the reasons why repeat victims avoid using medical services, and potentially other services, after a crime.

Sexual violence victimization also reduced the odds of formal health care use despite the fact that many sexual violence victims face increased risks of STDs (Fortenberry et al. 2002) and unwanted pregnancies (Gottschall and Gottschall 2003). Moreover, sexual violence victims' health care decisions seem unaffected by the severity of their injuries, which suggests that some are not receiving care they may desperately need. Sexual violence victims may avoid health services because they wish to avoid secondary victimization that arises from providers questioning whether sexual assault occurred (Patterson, Greeson, and Campbell, 2009) and negatively judging victims' dress and behavior leading up to the assault (Campbell, 2005). Sexual violence victims who forgo formal health care also forgo the physical trauma associated with sexual assault exams (Campbell and Raja 1999), which are even more invasive because they occur quickly after the traumatization of rape. Sexual assault victims have reported avoiding

medical treatment because they "could not bear being touched" again (Patterson, Greeson, and Campbell, 2009). In short, the anticipated harm associated with treating sexual violence appears to lead victims to avoid medical care even when it is most needed because of serious injury.

Increasing sexual violence victims' health care use requires practices that reduce the likelihood of secondary victimization. For example, increased use of victim advocates in hospitals can help rape victims navigate their medical and legal needs. Quasi-experimental research suggests that rape victims who deal with victim advocates have a better outlook—they are more willing to report to police, receive more medical services, and report less distress after interacting with medical and legal personnel (Campbell, 2006). Another practice that sexual violence victims may benefit from is coordinated care programs, where communities organize professional services from the legal, medical, and social system to address victims' needs and reduce secondary victimization behaviors (Campbell et al., 2001). However, evidence for these types of programs is mixed (e.g., sexual assault response teams; Greeson et al., 2016; Moylan and Lindhorst, 2015) and more robust evaluations are necessary.

While our study specifically focuses on formal health care use when violent victimization occurs, it has implications for other patient populations who are forced to make choices about their need for care versus situational factors that serve as barriers for care. Take for example the case of immigrants in the U.S. Those who are married or closely tied to family members with undocumented status or expired documents may also avoid health care for themselves in order to avoid placing their family members in positions to be deported (Derose, Escarce, and Lurie, 2007; Rhodes et al., 2015). In these cases, relationships again serve as barriers rather than facilitators of care. Another relevant case relates to opioid abuse, which is also both a medical and legal issue. To curb opiate overdose rates, some communities train residents who have a high

likelihood of witnessing an overdose to respond and prevent them. However, initial research on these programs find that responders call an ambulance in only half of the suspected overdoses (Lim et al. 2019). Moreover, responders were significantly less likely to call an ambulance when the person overdosing was an intimate partner compared to a stranger. Similar to victims of known offenders, responders who know the drug user may fear the legal consequences of using medical services.

Although our study findings are robust, they should be considered within the context of limitations. First, the NCVS does not include measures of victims' motivations for not using formal health care services. This type of measure would allow us to more directly test our theoretical arguments. Instead, we must rely on prior research that demonstrates how situational factors present substantial barriers to health care use. Second, the NCVS likely undercounts victimizations involving family members and intimate partners because it is a self-report survey that is administered in-person or over the phone, usually at the respondent's household. This may lead respondents to avoid reporting family and intimate partner violence for fear of discovery by other household members or retaliation by offenders. This limitation should lead our findings to be conservative because it is unlikely that victims who avoid reporting to the NCVS are particularly likely to report to a health care professional. Finally, we analyze repeated cross-sectional data, which limits our ability to speak fully to the causal nature of relationships between our predictors of formal health care use and receiving it.

Most violence victims who experience injury do not seek health care services. A major reason why victims avoid care is that they rarely sustain injuries serious enough to require professional medical treatment. While need is the primary driver of health care use, victims also avoid care because the circumstances surrounding the crime can present tangible and intangible

barriers to seeking formal health care services. Even though medical institutions offer the best treatments for violence injuries, some victims may perceive that visiting a formal health care provider may do more harm than good. A daunting challenge is to redress these perceptions so that victims receive the care they need and face minimal risk doing so.

NOTES

There is state-level variation in what must be reported, but all states require gunshot wounds to be reported.

[2] The behavioral model has limitations. It does not consider the dynamic nature of help-seeking and the importance of social networks in treatment-seeking (Aneshensel et al. 2019; Pescosolido 1992; Pescosolido et al. 1999). Yet, many scholars still find utility in the model and continue to adapt it in ways that inform studies of healthcare use, including those that focus on vulnerable populations such as the homeless (Gelberg, Andersen, and Leake 2000), intravenous drug users (Skeer et al. 2018), and LGBTQ individuals (Martos et al. 2018). It is in this spirit that we draw from it to select control variables that allow us to more stringently test how situational factors of crime and injury severity are related to violence victims' health care use.

[3] In sensitivity analyses, we treated no care and informal care as separate categories and used a multinomial logistic regression model to estimate each of these outcomes relative to formal care (and informal care relative to no care). We found that estimates of informal care versus formal care and no care versus formal care generally showed the same patterns of associations. In addition, estimated predictors of no care versus informal care showed only that sexual violence victims were more likely receive no care than informal care. Thus, treating no care and informal care as separate categories did not produce results that contributed to the literature beyond results shown here. Results from multinomial logistic regression models are available upon request.

[4] Because injuries are reported by the victim, our measure should be considered an indicator of perceived medical need, as opposed to evaluated medical need (i.e., actual need).

[5] According to the behavioral model (Andersen, 2008), predisposing factors also include health beliefs, such as attitudes, values, and knowledge about medical need and medical services. Unfortunately, these items are not measured by the NCVS.

[6] Coefficients from the interaction models are available in Appendix C for interested readers.

[7] Descriptive statistics of all variables are available in Appendix A.

[8] Appendix B presents all coefficients from Model 2, including all confounders.

[9] Appendix D displays predicted probabilities of formal care use for victims with minor injuries

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Table 1. Selected descriptive statistics for the total sample of violent victimizations involving victim injury

	(%)
Formal health care use (1=yes)	26.3
Victim-offender relationship	
Stranger (reference)	38.7
Acquaintance	25.2
Family member	8.5
Intimate partner	27.7
Repeat victimization	18.5
Sexual violence	9.8
Serious injuries	24.5
Sample size	9,912

Notes: All proportions are based on weighted and imputed data. Sample represents violent victimizations against persons 18 years or older that involved a physical injury to the victim. Descriptive statistics of control variables available in Appendix A.
Source: 1993-2017 National Crime Victimization Surveys

Table 2. Formal health care use by situational factors of victimization and serious injury

Situational factors	Formal Health Care Use Yes (%)
Victim-offender relationship	
Stranger (reference)	33.2
Acquaintance	25.2
Family member	22.2
Intimate partner	18.8
Repeat victimization	
Yes	29.2
No	13.4
Sexual violence	
Yes	22.8
No	26.7
Serious injuries	
Yes	54.2
No	17.3

Notes: All proportions are based on weighted and imputed data. Sample represents violent victimizations against persons 18 years or older that involved a physical injury to the victim.
Source: 1993-2017 National Crime Victimization Surveys

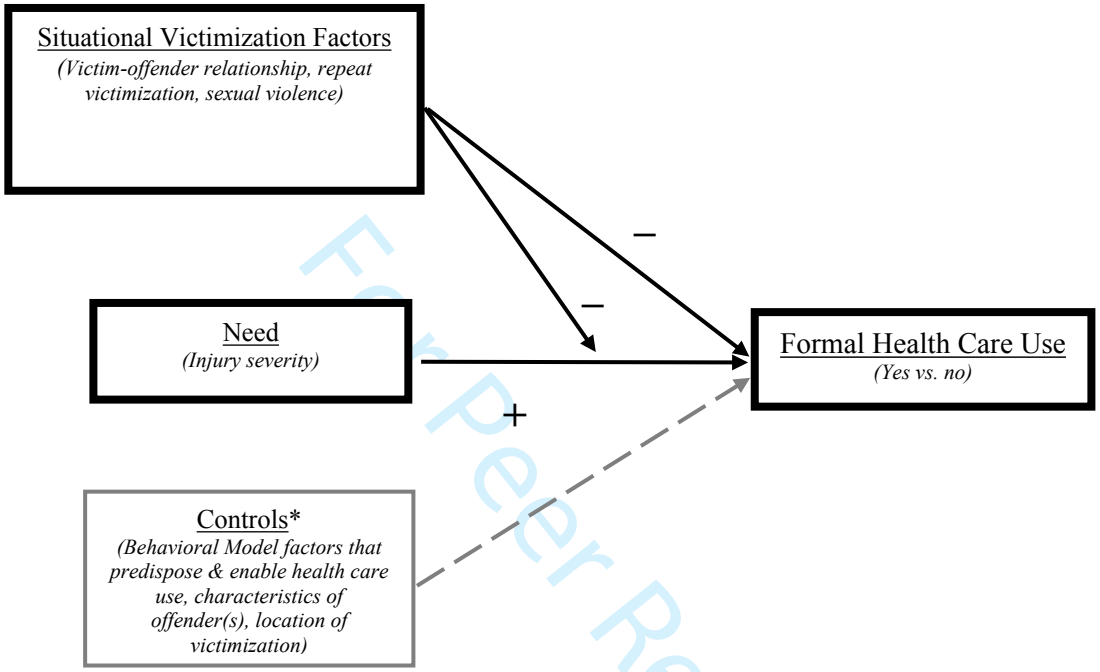
Table 3. Logistic regression of violence victims' use of formal care, NCVS 1993-2017 (n = 9,912)

Situational factors	Model 1	Model 2
Relationship		
Acquaintance	0.728*** [0.629,0.843]	0.764** [0.649,0.900]
Family	0.702** [0.559,0.883]	0.737* [0.568,0.955]
Intimate partner	0.636*** [0.547,0.739]	0.633*** [0.519,0.772]
Repeat victimization	0.489*** [0.406,0.589]	0.492*** [0.407,0.595]
Sexual violence	0.161*** [0.129,0.202]	0.160*** [0.125,0.204]
Serious injury	10.951*** [9.466,12.669]	11.351*** [9.757,13.204]
Controls		X
Year fixed effects	X	X

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

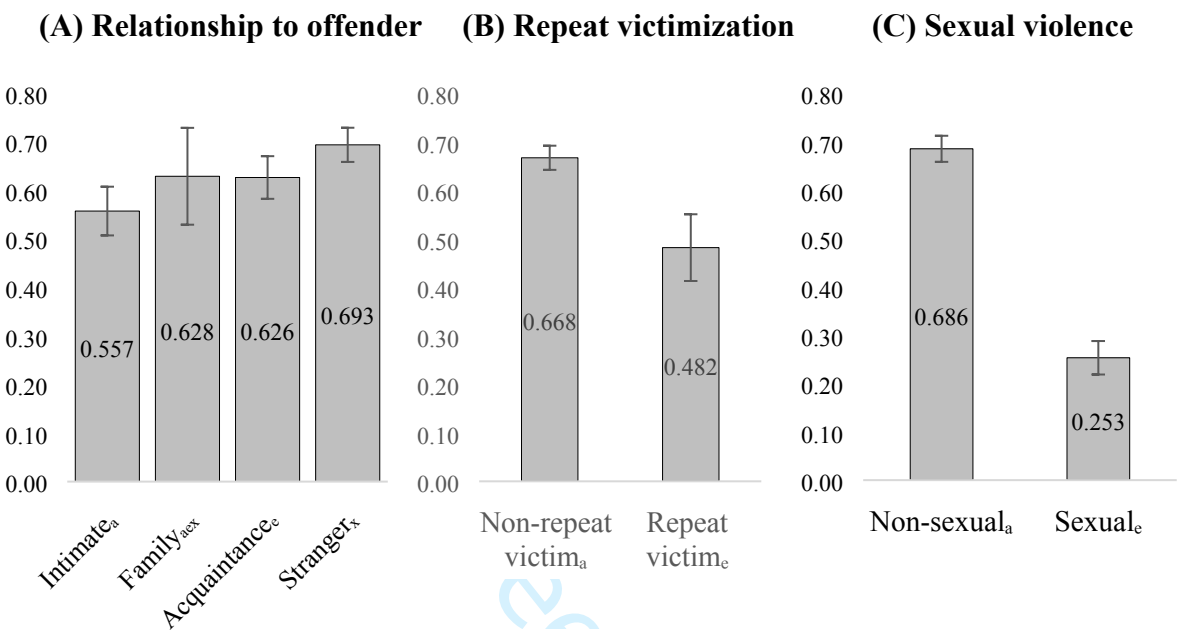
Note: Odds ratios and confidence intervals presented. Only the situational factors and injury severity are presented (full models available in appendix B). Models use imputed data along with the survey weights provided by the NCVS. Standard errors are clustered on the victim identification number to account for multiple victimization records. Reference categories of independent variables are stranger (relationship), non-sexual violence, non-repeat victimization, and minor injury.

Figure 1. Associations between Situational Victimization Factors, Need and Violence Victims' Formal Health Care Use



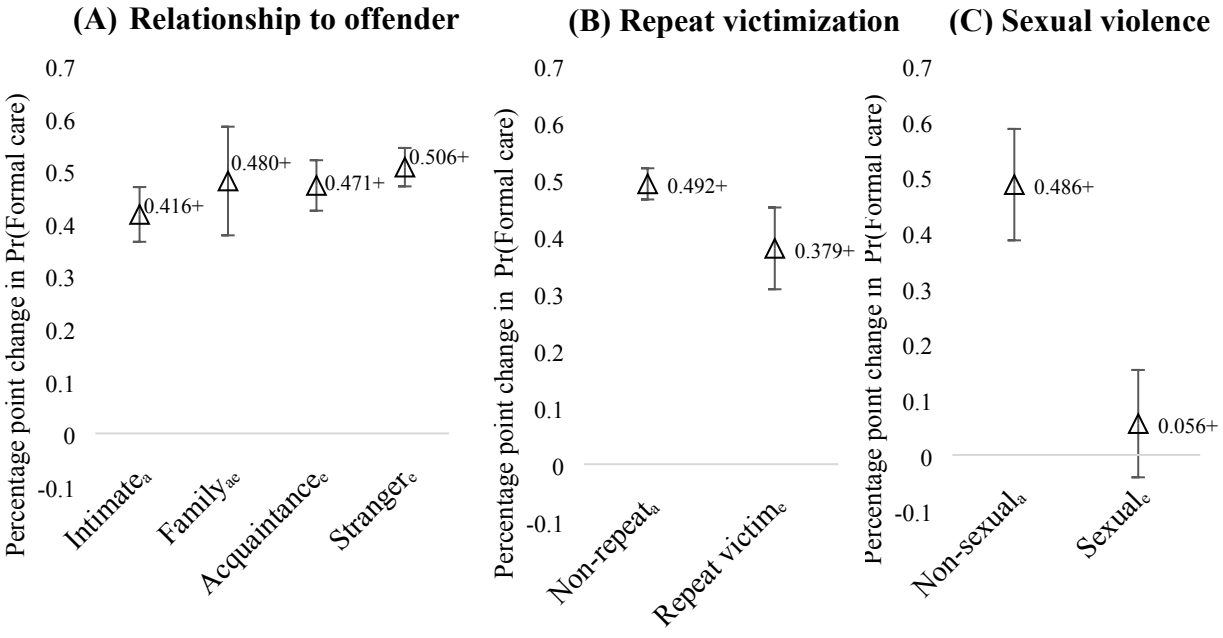
*_Note:_ We recognize that there are underlying relationships between control variables and both need for care and situational factors of crime victimization. The figure includes control variables in a single box with only a direct association to formal health care use because our analysis only addresses them as confounders. In addition, relationships between control variables and both need for care and situational factors of crime victimization are not a focal point of the current study.

Figure 2. Predicted probabilities of formal care use for victimizations involving serious injuries by (A) relationship to offender, (B) repeat victimization (B), and (C) sexual violence



Note: Predicted probabilities represent the probability that a victim used formal health care after the victimization. Categories that do not share a subscript (a e x) are statistically different at the 95% confidence level. Estimates are based on logit models of health care use that interacted each situational factor with injury

Figure 3. Effect of serious injury (vs. minor injury) on the probability the victim used formal care by relationship to offender (A), repeat victimization (B), and sexual violence (C)



Note: The effect of serious injury (estimates presented above) is the percentage point change in the probability a victim used formal care when they experienced serious injuries (vs. minor injuries). + indicates a positive change in the probability. This figure compares this effect across different categories of relationship, repeat victimization, and sexual violence. Categories within each panel that do not share a subscript ($_{a\,e}$) are significantly different at the 95% confidence level according to pairwise comparison t-tests. Estimates are based on logit models of health care use that interacted each situational factor with injury severity.

APPENDIX

Appendix A. Descriptive statistics of all study variables	
	(%) or M
Formal health care use	26.3
Situational factors	
Relationship	
Stranger	38.7
Acquaintance	25.2
Family	8.5
Intimate partner	27.7
Repeat victimization	43.4
Sexual violence	9.8
Serious injuries	24.5
Covariates	
Predisposing factors	
Age	33.2 (M)
Female	55.1
Race/ethnicity	
NH White	67.2
NH Black	15.6
NH other/mixed race	5.0
Hispanic	12.1
Education	
Less than high school	18.6
High school	35.9
Some college	38.2
Bachelor's or more	7.2
Married	21.0
Household size	2.9 (M)
Years in household	4.7 (M)
Enabling factors	
Health insurance[a]	65.5
Income (2015 dollars)	39,550.01 (M)
Employed	63.6
Own home	40.7
Vehicle ownership	
No car	16.0
1-2 cars	56.5
3 or more	27.4
Urbanicity	
Rural	15.8
Suburban	42.6
Urban	41.6
Region	
Northeast	16.3
Midwest	26.1
South	32.4
West	25.1
Offender sex	
All males	80.6
Only females	16.0
Mixed sex	3.5
Offender age	
Only youth	6.5

Youth & adult	3.1
Adult only	90.4
Residential location	57.2
Multiple offenders	21.2
Third party present	55.8

Note: M = mean. Descriptive statistics based on imputed data.

Appendix B. Logistic regression of violence victims' use of formal care, NCVS 1993-2017 (n = 9,912), full model 2

	Model 2
Situational factors	
Relationship	
Acquaintance	0.764** [0.649,0.900]
Family	0.737* [0.568,0.955]
Intimate partner	0.633*** [0.519,0.772]
Repeat victimization	0.492*** [0.407,0.595]
Sexual violence	0.160*** [0.125,0.204]
Serious injuries	11.351*** [9.757,13.204]
Covariates	
Predisposing factors	
Age	1.009*** [1.004,1.015]
Female	1.225** [1.066,1.407]
Race/ethnicity	
NH Black	1.467*** [1.235,1.741]
NH other/mixed race	1.223 [0.940,1.590]
Hispanic	1.170+ [0.971,1.410]
Education	
High school	0.943 [0.795,1.118]
Some college	0.935 [0.782,1.119]
Bachelor's or more	0.890 [0.668,1.187]
Married	1.027 [0.880,1.197]
Household size	1.066** [1.024,1.110]
Years in household	0.999 [0.990,1.007]
Enabling factors	
Health insurance[a]	1.683*** [1.407,2.012]
Income (2018 dollars)	1.000 [1.000,1.000]
Employed	0.923 [0.809,1.052]
Own home	1.160* [1.001,1.345]
Vehicle ownership	
1-2 cars	1.111

	[0.931,1.325]
3 or more	0.949 [0.757,1.189]
Urbanicity	
Suburban	0.881 [0.738,1.053]
Urban	0.869 [0.725,1.041]
Region	
Midwest	0.963 [0.795,1.166]
South	0.869 [0.721,1.047]
West	0.722** [0.593,0.878]
Offender sex	
Only females	0.813* [0.682,0.969]
Mixed sex	1.012 [0.746,1.374]
Offender age	
Youth & adult	1.138 [0.755,1.715]
Adult only	1.338* [1.032,1.735]
Residential location	0.943 [0.820,1.085]
Multiple offenders	1.315** [1.107,1.561]
Third party present	1.150* [1.006,1.314]
Year fixed effects	X

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Odds ratios and confidence intervals presented. Models use imputed data along with the survey weights provided by the NCVS. Standard errors are clustered on the victim identification number to account for multiple victimization records.

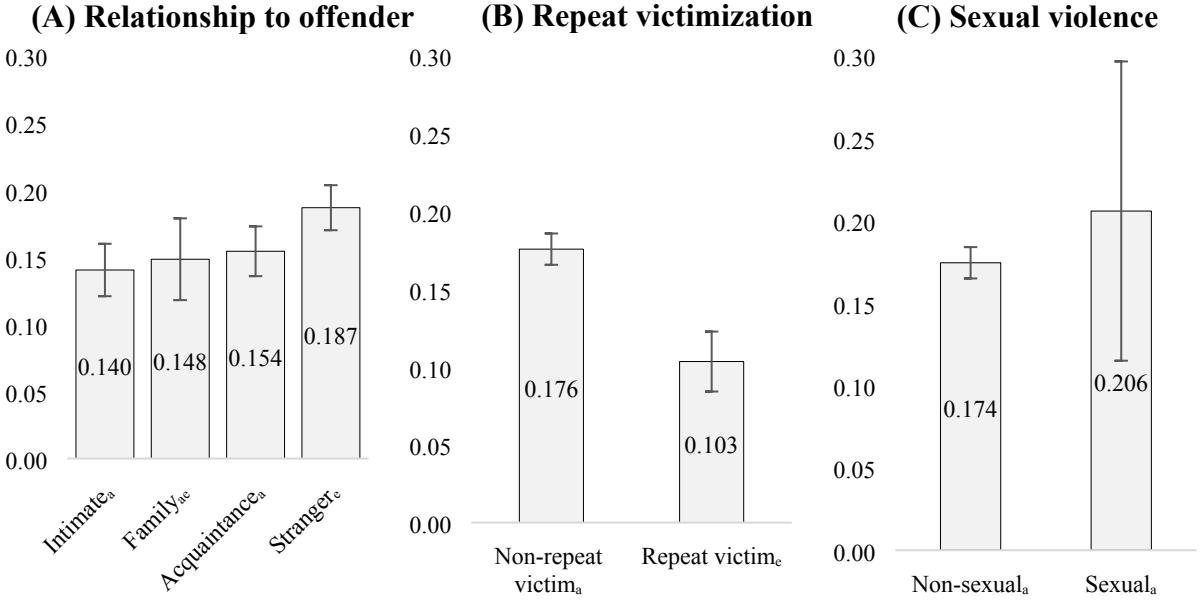
Appendix C. Logistic regression of violence victims' use of formal care, NCVS 1993-2017 (n = 9,912), Interaction Models

Situational factors	Relationship X Injury	Repeat victimization X Injury	Sexual violence X Injury
Relationship			
Acquaintance	0.785* [0.648,0.951]	0.763** [0.648,0.899]	0.761** [0.646,0.897]
Family	0.748* [0.559,0.999]	0.737* [0.568,0.956]	0.734* [0.565,0.953]
Intimate partner	0.699** [0.558,0.875]	0.637*** [0.522,0.777]	0.633*** [0.519,0.772]
Repeat victimization	0.498*** [0.412,0.601]	0.528*** [0.421,0.662]	0.491*** [0.406,0.594]
Sexual violence	0.166*** [0.129,0.214]	0.161*** [0.126,0.206]	1.239 [0.687,2.232]
Serious injury	12.474*** [10.125,15.368]	11.647*** [9.959,13.623]	12.209*** [10.504,14.192]
Interactions			
Relationship X Injury			
Acquaintance X Serious injury	0.906 [0.657,1.249]	-	-
Family X Serious injury	0.963 [0.542,1.711]	-	-
Intimate partner X Serious injury	0.736† [0.533,1.017]	-	-
Repeat victimization X Serious injury	-	0.801 [0.546,1.177]	-
Sexual violence X Serious injury	-	-	0.109*** [0.058,0.204]
Controls	X	X	X
Year fixed effects	X	X	X

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: Odds ratios and confidence intervals presented. Only the situational factors and injury severity are presented. Models use imputed data along with the survey weights provided by the NCVS. Standard errors are clustered on the victim identification number to account for multiple victimization records. Reference categories of independent variables are stranger (relationship), non-sexual violence, non-repeat victimization, and minor injury.

Appendix D. Predicted probabilities of formal care use for victimizations involving minor injuries by (A) relationship to offender, (B) repeat victimization (B), and (C) sexual violence



Note: Categories that do not share a subscript ($_{a\ e}$) are statistically different at the 95% confidence level according to pairwise comparison t-tests. Estimates based on logit models of health care use that interacted each situational factor with injury severity (Appendix C).