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## Nonfatal use of firearms in intimate partner violence: Results of a national survey

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### Abstract

Research on intimate partner violence (IPV) and firearms has typically focused on homicide, so there is limited information on how firearms are used in nonfatal ways, particularly in community samples. We sought to estimate the prevalence of nonfatal firearm abuse in the context of IPV, understand how and against whom firearms are used, and examine consequences of this abuse. Using a national web-based survey of US adults who experienced IPV ( $n = 958$ ), we asked respondents about experiences with nonfatal firearm abuse, including the frequency of firearm behaviors and consequences. Based on screening data weighted to be nationally representative, we estimated that 9.8% (95% CI: 9.0%, 10.6%) of US adults – or nearly 25 million – have experienced nonfatal firearm abuse by an intimate partner (i.e., were threatened with a firearm, had a firearm used on them, or were threatened by a partner who possessed or had easy access to a firearm). IPV victims who experienced nonfatal firearm abuse commonly reported experiencing other forms of IPV. The most common behaviors included the partner displaying a firearm (67.5%) and threatening to shoot the victim (63.0%). The majority (80.5%) of perpetrators were male, and 49.2% of respondents had a child at home at the time of abuse. The most common consequences of nonfatal firearm abuse were concerns for safety (86.2%) and feeling fearful (82.7%). Additionally, 43.1% of respondents reported physical injury, and 37.4% missed days of work or school. Practice and policy around firearm access for IPV perpetrators should attend to nonfatal firearm use against intimate partners.

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Declaration of Competing Interest

The authors have no conflicts of interest to disclose.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ypmed.2021.106500>.

## Keywords

Intimate partner violence; Firearms; Domestic violence; Threats; Survey

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## 1. Introduction

Intimate partner violence (IPV), including physical, sexual, and emotional harm, is a major public health issue (Breiding et al., 2015). Among US adults, 36.4% of women and 33.6% of men report experiencing sexual violence, physical violence, and/or stalking by an intimate partner in their lifetime (Smith et al., 2018). The estimated lifetime economic burden of IPV in the US is more than \$3.6 trillion for the 43 million adults reporting any lifetime victimization (Peterson et al., 2018). In abusive relationships, firearms increase the risk of IPV-related morbidity and mortality (Sorenson and Schut, 2018; Campbell et al., 2007).

Studies of firearms in the context of IPV have typically focused on homicide. Intimate partner homicides are captured in vital statistics, medical examiner reports, and police records, making them more easily identifiable for research compared to nonfatal outcomes. National estimates indicate that 55% of all homicides of women are related to IPV (Petrosky et al., 2017) and that firearms are used in nearly 60% of intimate partner homicides (Kivisto and Porter, 2020). For women in abusive relationships, the risk of homicide is greater than for men and increases five-fold when the partner has access to a firearm (Campbell et al., 2007; Fridel and Fox, 2019; Cooper and Smith, 2011).

Outside of the extreme outcome of homicide, firearms can be used in several nonfatal ways that harm individuals. Nonfatal firearm use is challenging to study because these incidents are not necessarily easily recognized or clearly defined or as routinely recorded as fatal events. The most recent national IPV survey that asked about nonfatal firearm abuse was conducted over 20 years ago, in 1995–1996 (Tjaden and Thoennes, 2000). Based on that survey, it was estimated that 4.5 million women in the U.S. have been threatened by an intimate partner with a firearm, and that nearly 1 million have had a partner use a firearm on them (Sorenson and Schut, 2018; Tjaden and Thoennes, 2000). Firearms can be used to threaten the partner, brandished or displayed, used in pistol whipping (i.e., hitting the victim with a firearm), or used to shoot the partner (Sorenson, 2017; Sorenson and Spear, 2018).

IPV victims perceive firearms to be uniquely dangerous in the context of abuse, contributing to high levels of intimidation and fear (Lynch and Logan, 2018). Firearms can perpetuate coercive control – the “strategic course of oppressive conduct that is typically characterized by frequent, but low-level physical abuse and sexual coercion in combination with tactics to intimidate, degrade, isolate, and control victims” (Stark, 2013) – which plays a critical role in the micromanagement of victims’ daily lives and chronic abuse (Sorenson and Schut, 2018; Lynch et al., 2019). Prior research also highlights the strong connection between firearm threats and stalking, which is particularly common after victims leave their abusers and during periods of separation when abusers may feel a loss of control (Logan and Lynch, 2018). Compared to non-stalkers, intimate partner stalkers are more likely to threaten the victim with a firearm (often during a stalking episode) and more likely to perpetrate physical

violence (Logan and Lynch, 2018). Indeed, the majority of women murdered by intimate partners are stalked prior to a homicide (McFarlane et al., 1999).

A 2018 systematic review identified 10 studies that reported the prevalence of the nonfatal use of firearms against an intimate partner among US women (Sorenson and Schut, 2018). Prevalence estimates varied widely based on the sample, time frame, and behaviors assessed (e.g., <1% reported a hostile firearm display by an intimate partner in the past five years compared to 37% of women in domestic violence shelters reporting that a firearm had been used against them in their most recent relationship) (Sorenson and Wiebe, 2004; Azrael and Hemenway, 2000). Importantly, six of the 10 studies were based on data collected 15 or more years ago (Sorenson and Schut, 2018). In addition, several studies were among samples living in shelters or accessing services (Sorenson and Wiebe, 2004; Rothman et al., 2005; Berrios and Grady, 1991), which provide an understanding of potentially more severe IPV contexts but are not necessarily representative of broader populations. Only two studies were conducted among national community samples (Tjaden and Thoennes, 2000; Azrael and Hemenway, 2000).

Additional research on the nature and scope of nonfatal firearm use against an intimate partner, particularly among community samples, is needed (Sorenson and Schut, 2018). Examining specific kinds of threats and abuse victims experience is essential to understanding the context and far-reaching consequences of IPV. The purpose of this study was to estimate the prevalence of nonfatal firearm abuse, understand how and against whom firearms are used, and examine the consequences of nonfatal firearm abuse in a large national sample.

## 2. Methods

### 2.1. Sampling and design

We designed a cross-sectional survey administered by the survey research firm YouGov from April 8th to May 1st, 2020 (About YouGov, 2018). YouGov maintains a proprietary opt-in survey panel comprised of 1.8 million US residents who participate in web surveys. This panel has been used widely for academic studies as well as public opinion and election polling (Cohn, 2014; Enamorado and Imai, 2019; Rydberg et al., 2018; Lindhiem et al., 2020). Participants did not receive any specific incentive to complete the survey, although YouGov has a point-based system through which participants accrue points for completing surveys and can redeem them later for gift cards, donations, or prepaid cash cards.

This study included women and men in the US aged 18 years. We determined eligibility for the full survey based on responses to two screening questions. The first question asked if respondents ever had a romantic or sexual partner. Those who answered affirmatively were asked if a partner ever perpetrated a series of items capturing different types of IPV (e.g., physical, sexual). Respondents who endorsed any of the IPV items were deemed eligible for the full survey.

Of the 12,068 panel members who were invited to take the survey, 8048 (66.7%) completed the screening questions, and 1743 (21.7%) were eligible for the full survey. Of eligible

respondents, 1152 (66.1%) completed the survey. After fielding the survey, YouGov conducted validity checks and did a sample match of all participants who started the survey down to a smaller sampling frame to improve the representativeness of the unweighted sample (Appendix A) (Rivers, 2006). The final sample consisted of 1000 respondents who experienced IPV, of whom 600 experienced nonfatal firearm abuse. Respondents were considered to have ‘experienced nonfatal firearm abuse’ if they endorsed either of two items: if a partner “threatened [the respondent] and also possessed or had easy access to a gun” ( $n = 561$ ) or “threatened [the respondent] with a gun or used a gun on [the respondent]” ( $n = 288$ ), with 249 respondents endorsing both. We included both items given prior research documenting that firearm presence can be an implicit threat and that knowing a partner has access to a firearm instills fear regardless of explicit use of the firearm (Sorenson and Schut, 2018; Lynch and Logan, 2018; Tutty, 2015). Respondents who experienced nonfatal firearm abuse were oversampled to examine the specific ways that firearms are used in IPV.

Sampling weights provided by YouGov were applied such that estimates from the survey are representative of all US adults aged 18 years based on demographics from the 2017 American Community Survey (Appendix A), but not a nationally representative sample of IPV victims. This study was deemed exempt by the University of Washington Institutional Review Board since data were de-identified.

## 2.2. Measures

To our knowledge, there are no validated measures about nonfatal firearm abuse, so we developed questions using an iterative process informed by findings in existing literature (Sorenson, 2017; Logan and Lynch, 2018; Sorenson and Wiebe, 2004) and consultation with subject matter experts and former IPV advocates. All survey questions related to this analysis are provided in Appendix B. Respondents answered yes or no to 10 items on lifetime experiences of types of IPV (Smith et al., 2018; Chapman and Gillespie, 2019). Physical violence included being hit, slapped, kicked, and strangled or choked. Sexual violence included rape, sexual coercion, and unwanted sexual contact. Psychological/emotional abuse and controlling behaviors included stalking, tracking the respondent, and controlling access to money and finances.

IPV victims who experienced nonfatal firearm abuse based on the screening question were asked about the frequency of nine specific firearm-related behaviors by their *current or most recent partner* who threatened them with a firearm, so the behaviors are limited to a single relationship. These included the partner displaying the firearm; hitting the respondent’s body with a firearm; threatening to shoot the respondent, a pet, themselves, or someone else; shooting the gun but not hitting anyone; and shooting the respondent or someone else. Response options for each item were collapsed into three categories: never, once per year (includes less than once/year and once/year), and > once per year (includes more than once/year, monthly, weekly, and daily).

For consequences of firearm use, participants were asked if they experienced any of a list of 19 items resulting from their partner’s firearm use including feeling fearful, splitting up with partner, moving out of their home, going to a shelter, physical injury, contacting a crisis hotline, and missing days of work or school (Smith et al., 2018).

Demographic characteristics included age, gender, race/ethnicity, sexual orientation, relationship status, household income, highest level of education, and region.

### 2.3. Statistical analysis

For this analysis, we excluded 42 participants who reported that they were shot more than once a year but did not endorse physical injury as a consequence ( $n = 27$ ) and participants who reported that their partner shot them or someone else weekly or daily ( $n = 15$ ). This proportion of respondents with invalid responses is in line with prior survey research quantifying careless or insufficient effort responders (Curran, 2016). The final sample size for this analysis was 958, including 558 IPV victims who experienced nonfatal firearm abuse.

We calculated weighted prevalence of IPV and experiences of nonfatal firearm abuse based on the 8048 respondents who completed the screener. Subsequent analyses were based on the 958 respondents described above. We calculated weighted percentages and their corresponding 95% confidence intervals (CIs) for each variable. We described sociodemographic characteristics and types of IPV reported by IPV victims by whether they experienced nonfatal firearm abuse. Among IPV victims who experienced nonfatal firearm abuse, we described the frequency of specific firearm behaviors and consequences of their partner's firearm abuse. All survey questions had a 'prefer not to say' response option. Percentages reported do not include these missing data; the amount of missing data is noted in the tables. All analyses were conducted using STATA 15.1 (StataCorp) using the SVY suite of commands.

## 3. Results

In the US in 2020, our data suggest that 46.7% (95% CI: 45.2%–48.2%) of adults experienced some form of IPV in their lifetime, and 9.8% of adults (95% CI: 9.0%–10.6%) experienced nonfatal firearm abuse by an intimate partner (i.e., were threatened with a firearm, had a firearm used on them, or were threatened by a partner who possessed or had easy access to a firearm). Among women, the prevalence of lifetime IPV was 52.2% (95% CI: 50.3%–54.1%) with 13.6% (95% CI: 12.3%–14.9%) experiencing nonfatal firearm abuse. Among men, the prevalence of lifetime IPV was 40.8% (95% CI: 38.7%–42.9%) with 5.9% (95% CI: 4.8%–7.0%) experiencing nonfatal firearm abuse. Compared with IPV victims who did not experience nonfatal firearm abuse, a greater proportion of those who did experience nonfatal firearm abuse were female, were Black or African American, were divorced or separated, had household income less than \$35,000, had high school education or less, and lived in the Southern region of the US (Table 1).

IPV victims who experienced nonfatal firearm abuse were more likely to report experiencing other forms of IPV in their lifetime compared to those who did not experience nonfatal firearm abuse. For example, 78.9% (95% CI: 74.9%–82.4%) of IPV victims who experienced nonfatal firearm abuse reported that a partner hit, slapped, kicked, or otherwise physically hurt them, compared to 42.1% (95% CI: 37.1%–47.2%) of IPV victims who did not experience nonfatal firearm abuse (Table 2). Nearly two thirds (62.1%; 95% CI: 57.4%–66.5%) of IPV victims who experienced nonfatal firearm abuse reported that a partner tried

to make them have sex, compared to 32.0% (95% CI: 27.5%–36.9%) of those who did not experience nonfatal firearm abuse. IPV victims who experienced nonfatal firearm abuse were also more likely to report controlling behaviors by partners. For example, over half (51.9%; 95% CI: 47.3%–56.4%) of IPV victims who experienced nonfatal firearm abuse reported that a partner controlled their ability to access money and finances, compared to 20.2% (95% CI: 16.4%–24.7%) of those who did not experience nonfatal firearm abuse.

One in five IPV victims who experienced nonfatal firearm abuse reported they were threatened with a firearm by more than one partner (20.6%; 95% CI: 16.9%–24.8%). The weighted mean age of respondents at first threat was 26.1 years (SD: 10.5). The current or most recent partner who perpetrated nonfatal firearm abuse was most often male (80.5%; 95% CI: 76.3%–84.1%). Approximately half of respondents (49.2%; 95% CI: 44.6%–53.8%) had a child in the home at the time. The weighted mean duration of the relationship with this partner was 8.3 (SD: 9.2) years; the unweighted median was 4.8 (IQR: 2.1–12.0) years. The weighted mean duration of nonfatal firearm abuse was 3.7 (SD: 5.4) years; the unweighted median was 2.0 (IQR: 0.5–5.0) years.

For IPV victims who experienced nonfatal firearm abuse, the most common behaviors reported included the partner displaying a firearm (37.7% reported this occurring more than once per year; 95% CI: 33.2%–42.4%) and partner threatening to shoot the victim (27.4% reported this occurring more than once per year; 95% CI: 23.4%–31.7%) (Fig. 1). In addition to threats, 12.6% (95% CI: 9.7%–16.1%) of victims reported that their partner shot the firearm but did not hit anyone and 8.7% (95% CI: 6.3%–11.8%) reported that their partner hit their body with a firearm more than once per year.

Among IPV victims who experienced nonfatal firearm abuse, the most common consequences were concerns for safety (86.2%; 95% CI: 82.6%–89.2%), feeling fearful (82.7%; 95% CI: 78.8%–85.9%), feeling on guard/watchful/easily startled (72.5%; 95% CI: 68.1%–76.5%), and splitting up with partner (71.0%; 95% CI: 66.5%–75.1%) (Table 3). In addition, 43.1% (95% CI: 38.5–47.9%) of victims reported physical injury, 37.4% (95% CI: 33.0%–42.0%) missed days of work or school, 29.8% (95% CI: 25.7%–34.3%) called the police, 27.9% (95% CI: 23.8%–32.3%) sought legal services, 22.6% (95% CI: 18.7%–26.9%) sought medical care, 16.1% (95% CI: 12.8%–20.0%) sought victim's advocate services, and 12.8% (95% CI: 9.8%–16.6%) contacted a crisis hotline as a result of their partner's firearm use.

#### 4. Discussion

Findings from this national community sample reveal that the prevalence of nonfatal firearm abuse is substantial and concerning. Approximately 1 in 10 (9.8%) – or nearly 25 million – adults in the US have experienced nonfatal firearm abuse by an intimate partner (i.e., were threatened with a firearm, had a firearm used on them, or were threatened by a partner who possessed or had easy access to a firearm). While lifetime prevalence of IPV from this survey generally aligns with prior estimates (Smith et al., 2018; Smith et al., 2017), the prevalence of nonfatal firearm abuse from this survey is higher than the last national data from the mid-1990s, which estimated that 3.5% of women and 0.4% of men were threatened

with a firearm and 0.7% of women and 0.1% of men had a firearm used on them (Tjaden and Thoennes, 2000). Our findings are higher in part due to broader survey questions that encompassed threats while the partner possessed or had easy access to a firearm in addition to threats with the firearm or use of a firearm against the victim. Indeed, when restricted to a more conservative definition of nonfatal firearm abuse (i.e., including only those who report their partner threatening them with a gun or using a gun on them), our prevalence estimate was 4.8% (95% CI: 4.2%–5.4%). Our findings also potentially reflect increased perpetrator access to firearms, in line with the increase in firearm-related intimate partner homicides in the past decade (Fridel and Fox, 2019). We also found that the prevalence of nonfatal firearm abuse was 13.6% among women and 5.9% among men. Consistent with prior IPV studies, results suggest that women are disproportionately impacted over their lifetimes (Smith et al., 2018; Breiding et al., 2008; Addington and Perumean-Chaney, 2014; Wiebe, 2003). Given the considerable difference in prevalence of nonfatal firearm abuse between women and men, future research should investigate the gender differences for both victims and perpetrators in demographics, specific firearm behaviors, and consequences of this abuse.

We found that victims who experience nonfatal firearm abuse are more likely than those who do not to report experiencing other types of IPV, including physical, sexual, and psychological/emotional abuse, in their lifetimes. These findings align with prior research highlighting that firearms are often used to facilitate coercive control (Logan and Lynch, 2018; Johnson, 2006; Stark, 2006), resulting in a frightening and controlling context that enables the occurrence and continuation of physical and sexual abuse (Sorenson and Schut, 2018; Tutty, 2015). Qualitative research with women in IPV shelters has similarly shown that firearms are simply one tool used to harm victims and that abusers are often violent in other ways (Lynch and Logan, 2018; Sorenson and Wiebe, 2004). Since respondents reported these IPV experiences over their lifetimes, these behaviors may have been perpetrated by a single or multiple partners. Prior research has underscored that individuals often experience IPV, and even co-occurring types (e.g., coercive control and physical IPV) in multiple relationships (Thompson et al., 2006; Kennedy et al., 2018). Future research should examine patterns of nonfatal firearm abuse using relationship-level data.

Among IPV victims who experienced nonfatal firearm abuse, approximately two thirds reported that their partner displayed a firearm, and 63% reported that their partner threatened to shoot them. Threats by the abuser to shoot themselves (44%), someone else (35%), or a pet (23%) were also fairly common in our sample. These findings align closely with a prior study among women who contacted the National Domestic Violence Hotline (Logan and Lynch, 2018). These threats underscore that the burden of IPV may extend beyond the partner involved and affect children, other family members, friends, and pets. Indeed, these other individuals are sometimes killed in intimate partner homicide incidents (Smith et al., 2014), and the use of firearms increases the risk of multiple victims by 70% in domestic homicides (Kivisto and Porter, 2020). Moreover, victims commonly reported that these firearm behaviors occurred more than once per year, further highlighting these behaviors as part of a recurring pattern of abuse rather than isolated incidents of violence.

Nonfatal firearm abuse has direct and damaging consequences for IPV victims. In our sample, most IPV victims who experienced nonfatal firearm abuse felt concerned about



safety and were fearful, constantly on guard, or easily startled (Sorenson, 2017). In addition to the multiple and potentially long-lasting psychological consequences of nonfatal firearm abuse (Sullivan and Weiss, 2017), many victims reported physical injury, seeking medical care, and missing days of work or school. Given that the broader health consequences of IPV are well-established (Smith et al., 2018) and that firearm threats have been identified as a unique predictor of posttraumatic stress disorder symptom severity (Sullivan and Weiss, 2017), further research examining the specific adverse health consequences of nonfatal firearm abuse is needed. In addition, consequences of firearm abuse such as splitting up or moving out may be complicated by the fact that firearm threats and stalking are common during separation (Lynch et al., 2019; Logan and Lynch, 2018). More granular information about the timing of these consequences (e.g., immediately or several months after firearm abuse) should be assessed in future research to identify intervention points. Importantly, many victims also reported seeking help from the police, legal services, victim's advocate services and crisis hotlines, pointing to the need for investment in services for IPV victims. The 2019 National Census of Domestic Violence Services showed that while more than 77,000 victims were served in a single 24-h period, there were more than 11,000 requests for services that were unmet due to a lack of resources (National Network to End Domestic Violence, 2020). Taken with our findings, this demonstrates a critical need for resources for community-based programs that provide help and care to IPV victims.

Federal and state laws have been enacted to prohibit possession of firearms by individuals convicted of an IPV-related felony or misdemeanor (Zeoli et al., 2019; Diez et al., 2017). Current state laws vary greatly in the breadth of conditions that prohibit firearm possession and in the implementation of recovering firearms from prohibited individuals (Zeoli et al., 2019). These firearm restrictions have been found to reduce intimate partner homicide (Diez et al., 2017; Zeoli et al., 2018). The frequency of nonfatal firearm abuse and adverse consequences for IPV victims in this study lends urgency to the need to consider expanding laws to prohibit possession among broader groups of IPV perpetrators (e.g., dating partners) (Sorenson and Spear, 2018), to explicitly address relinquishment or seizure of firearms from those who are prohibited from possessing them (Diez et al., 2017; Gerney and Parsons, 2014), and to enhance implementation of these laws (Zeoli et al., 2018). More robust surveillance of nonfatal firearm use in IPV (e. g., with more granular questions added to CDC's National Intimate Partner and Sexual Violence Survey or DOJ's National Crime Victimization Survey) would also allow for future research to evaluate the impact of such laws on relevant nonfatal outcomes.

#### 4.1. Limitations

As with any self-reported survey, recall and social desirability bias may exist. Recall bias may be of particular concern for respondents answering questions about relationships or experiences occurring long ago in their lifetimes. However, many of these firearm-related incidents are salient and memorable and, to mitigate recall bias, we asked about behaviors perpetrated by the current or most recent partner. While these were sensitive questions, online panel surveys may be less biased due to social desirability compared to telephone surveys (Chang and Krosnick, 2009). Due to this sensitivity, all questions had a 'prefer not to say' response option, so the amount of missing data varied across questions. Most

questions in this analysis were missing 5% of responses. Our survey questions about nonfatal firearm abuse have not been subjected to psychometric testing. Methodologic research that yields valid and reliable measures for nonfatal firearm abuse would greatly benefit the field. While the survey asked sensitive questions that may have resulted in a lower survey completion proportion, the completion proportion of 66% is in line with or greater than that of other non-probabilities, opt-in, online surveys (Callegaro and Disogra, 2008), including a previous national survey that included questions about firearms (Miller et al., 2017). Nevertheless, panel members who chose not to participate in the survey may have differed from those who chose to participate with respect to IPV victimization, firearm abuse, and severity. Finally, although sampling weights were applied to enhance representativeness and YouGov augments the panel by soliciting panelists by telephone and mail, there may be coverage error in non-probability online samples which may not be fully representative of the national population (Chang and Krosnick, 2009; Hays et al., 2015).

## 5. Conclusions

This study provides contemporary, national estimates of nonfatal firearm abuse prevalence in the US and detailed information on specific behaviors and consequences among a community sample. While there is substantial evidence that firearms increase the risk of homicide in abusive relationships, these findings underscore that firearms do not need to be fired to harm an intimate partner. Firearms can enable controlling behaviors by heightening fear and often co-occur with other forms of IPV within and across relationships. This study sheds light on the magnitude of nonfatal firearm abuse and adverse consequences for victims, indicating the crucial need to focus attention and resources on the prevention of IPV.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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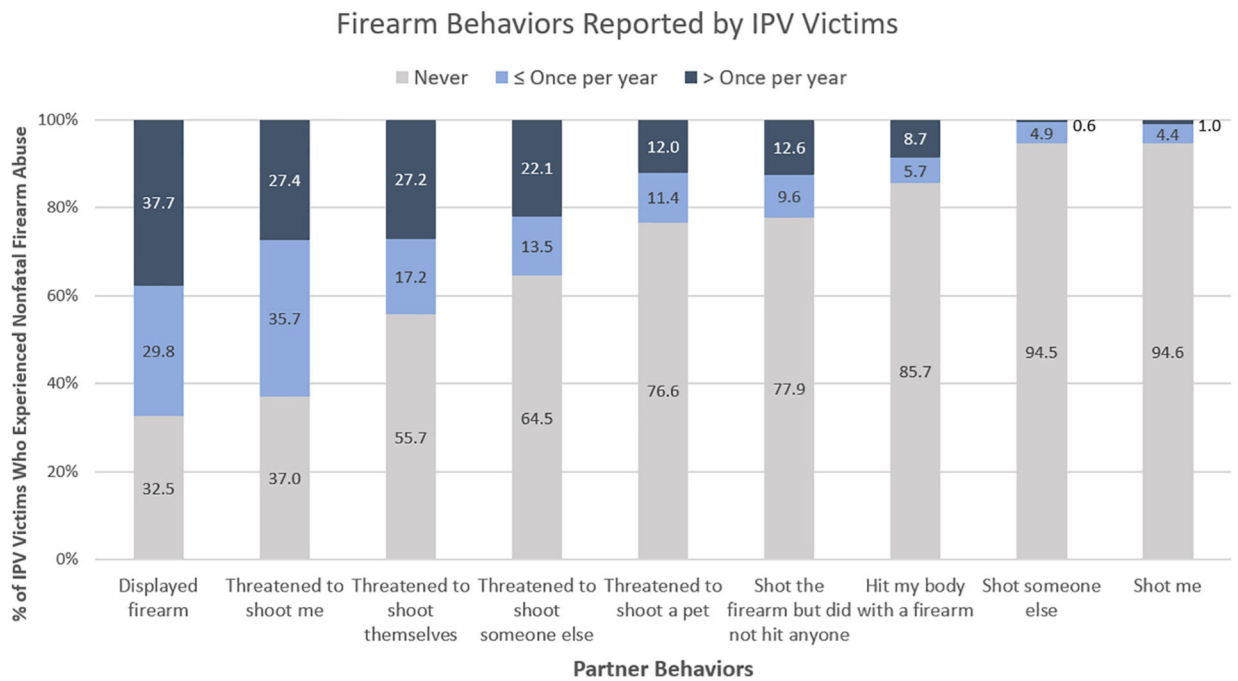
## References

- About YouGov, 2018. Published. Accessed June 23, 2020. <https://today.yougov.com/about/>.
- Addington LA, Perumean-Chaney SE, 2014. Fatal and non-fatal intimate partner violence: What separates the men from the women for victimizations reported to police? *Homicide Stud* 18 (2), 196–220. 10.1177/1088767912471341.
- Azrael D, Hemenway D, 2000. “In the safety of your own home”: Results from a national survey on gun use at home. *Soc. Sci. Med* 50 (2), 285–291. 10.1016/S0277-9536(99)00283-X. [PubMed: 10619696]

- Berrios DC, Grady D, 1991. Domestic violence: Risk factors and outcomes. *West J. Med* 155 (2), 133–135. [PubMed: 1926841]
- Breiding MJ, Black MC, Ryan GW, 2008. Prevalence and risk factors of intimate partner violence in eighteen U.S. states/territories, 2005. *Am. J. Prev. Med* 34 (2), 112–118. 10.1016/j.amepre.2007.10.001. [PubMed: 18201640]
- Breiding MJ, Basile KC, Smith SG, et al., 2015. Intimate Partner Violence Surveillance: Uniform Definitions and Recommended Data Elements, Version 2.0 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.
- Callegaro M, Disogra C, 2008. Computing response metrics for online panels. *Public Opin. Q* 72 (5), 1008–1032. 10.1093/poq/nfn065.
- Campbell JC, Glass N, Sharps PW, Laughon K, Bloom T, 2007. Intimate partner homicide: Review and implications of research and policy. *Trauma Violence Abuse* 10.1177/1524838007303505. Published online.
- Chang L, Krosnick JA, 2009. National surveys via RDD telephone interviewing versus the internet: comparing sample representativeness and response quality. *Public Opin. Q* 73 (4), 641–678. 10.1093/poq/nfp075.
- Chapman H, Gillespie SM, 2019. The Revised Conflict Tactics Scales (CTS2): a review of the properties, reliability, and validity of the CTS2 as a measure of partner abuse in community and clinical samples. *Aggress. Violent Behav* 44, 27–35. 10.1016/j.avb.2018.10.006.
- Cohn N, 2014. Explaining online panels and the 2014 midterms. In: *The New York Times* Published July 27, 2014. <https://www.nytimes.com/2014/07/28/upshot/explaining-online-panels-and-the-2014-midterms.html>.
- Cooper A, Smith E, 2011. Homicide Trends in the United States, 1980–2008. Bureau of Justice Statistics. <https://www.bjs.gov/content/pub/pdf/htus8008.pdf>.
- Curran PG, 2016. Methods for the detection of carelessly invalid responses in survey data. *J. Exp. Soc. Psychol* 66, 4–19. 10.1016/j.jesp.2015.07.006.
- Diez C, Kurland RP, Rothman EF, et al., 2017. State intimate partner violence-related firearm laws and intimate partner homicide rates in the United States, 1991 to 2015. *Ann. Intern. Med* 167 (8), 536–543. 10.7326/M16-2849. [PubMed: 28975202]
- Enamorado T, Imai K, 2019. Validating self-reported turnout by linking public opinion surveys with administrative records. *Public Opin. Q* 83 (4), 723–748. 10.1093/poq/nfz051.
- Fridel EE, Fox JA, 2019. Gender differences in patterns and trends in U.S. homicide, 1976–2017. *Violence Gend* 6 (1), 27–36. 10.1089/vio.2019.0005.
- Gerney A, Parsons C, 2014. *Women Under the Gun: How Gun Violence Affects Women and 4 Policy Solutions to Better Protect Them*. Center for American Progress.
- Hays RD, Liu H, Kapteyn A, 2015. Use of Internet panels to conduct surveys. *Behav. Res. Methods* 47 (3), 685–690. 10.3758/s13428-015-0617-9. [PubMed: 26170052]
- Johnson MP, 2006. Conflict and control: Gender symmetry and asymmetry in domestic violence. *Viol. Against Women* 12 (11), 1003–1018. 10.1177/1077801206293328.
- Kennedy AC, Bybee D, McCauley HL, Prock KA, 2018. Young women’s intimate partner violence victimization patterns across multiple relationships. *Psychol. Women Q* 42 (4), 430–444. 10.1177/0361684318795880.
- Kivisto AJ, Porter M, 2020. Firearm use increases risk of multiple victims in domestic homicides. *J. Am. Acad. Psychiatry Law* 48 (1) 10.29158/JAAPL.003888-20.
- Lindhiem O, Vaughn-Coaxum RA, Higa J, Harris JL, Kolko DJ, Pilkonis PA, 2020. Development and validation of the parenting skill use diary (PSUD) in a nationally representative sample. *J. Clin. Child Adolesc. Psychol* 10.1080/15374416.2020.1716366. Published online.
- Logan T, Lynch KR, 2018. Dangerous liaisons: Examining the connection of stalking and gun threats among partner abuse victims. *Violence Vict* 33 (3), 399–416. 10.1891/0886-6708.v33.i3.399. [PubMed: 30567855]
- Lynch KR, Logan TK, 2018. “You better say your prayers and get ready”: Guns within the context of partner abuse. *J. Interp. Violence* 33 (4), 686–711. 10.1177/0886260515613344.

- Lynch KR, Jackson DB, Logan TK, 2019. Coercive control, stalking, and guns: Modeling service professionals' perceived risk of potentially fatal intimate partner gun violence. *J. Interpers Violence* 10.1177/0886260519839419. Published online.
- McFarlane JM, Campbell JC, Wilt S, Sachs CJ, Ulrich Y, Xu X, 1999. Stalking and intimate partner femicide. *Homicide Stud* 3 (4), 300–316. 10.1177/1088767999003004003.
- Miller M, Hepburn L, Azrael D, 2017. Firearm acquisition without background checks: Results of a national survey. *Ann. Intern. Med* 66 (4), 233–239. 10.7326/M16-1590.
- National Network to End Domestic Violence, 2020. 14th Annual Domestic Violence Counts Report
- Peterson C, Kearns MC, McIntosh WLKW, et al., 2018. Lifetime economic burden of intimate partner violence among US adults. *Am. J. Prev. Med* 55 (4), 433–444. [PubMed: 30166082]
- Petrosky E, Blair JM, Betz CJ, Fowler KA, Jack SPD, Lyons BH, 2017. Racial and ethnic differences in homicides of adult women and the role of intimate partner violence—United States, 2003–2014. *MMWR Morb. Mortal. Wkly Rep* 66, 741–746. 10.15585/mmwr.mm6628a1. [PubMed: 28727682]
- Rivers D, 2006. Sample Matching: Representative Sampling from Internet Panels
- Rothman EF, Hemenway D, Miller M, Azrael D, 2005. Batterers' use of guns to threaten intimate partners. *J. Am. Med. Assoc* 60 (1), 62–68. [PubMed: 16845765]
- Rydberg J, Dum CP, Socia KM, 2018. Nobody gives a #%&! : a factorial survey examining the effect of criminological evidence on opposition to sex offender residence restrictions. *J. Exp. Criminol* 14 (4), 541–550. 10.1007/s11292-018-9335-5.
- Smith SG, Fowler KA, Niolon PH, 2014. Intimate partner homicide and corollary victims in 16 states: National violent death reporting system, 2003–2009. *Am. J. Public Health* 104 (3), 461–466. 10.2105/AJPH.2013.301582. [PubMed: 24432943]
- Smith SG, Chen J, Basile KC, et al., 2017. The National Intimate Partner and Sexual Violence Survey (NISVS): 2010–2012 State Report National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.
- Smith SG, Zhang X, Basile KC, et al., 2018. The National Intimate Partner and Sexual Violence Survey (NISVS): 2015 Data Brief – Updated Release National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.
- Sorenson SB, 2017. Guns in intimate partner violence: comparing incidents by type of weapon. *J. Women's Health* 26 (3), 249–258. 10.1089/jwh.2016.5832.
- Sorenson SB, Schut RA, 2018. Nonfatal gun use in intimate partner violence: a systematic review of the literature. *Trauma Violence Abuse* 19 (4), 431–442. 10.1177/1524838016668589. [PubMed: 27630138]
- Sorenson SB, Spear D, 2018. New data on intimate partner violence and intimate relationships: implications for gun laws and federal data collection. *Prev. Med. (Baltim)* 10.1016/j.jpmed.2018.01.005. Published online.
- Sorenson SB, Wiebe DJ, 2004. Weapons in the lives of battered women. *Am. J. Public Health* 94 (8), 1412–1417. 10.2105/AJPH.94.8.1412. [PubMed: 15284052]
- Stark E, 2006. Commentary on Johnson's "conflict and control: Gender symmetry and asymmetry in domestic violence.". *Viol. Against Women* 12 (11), 1019–1025. 10.1177/1077801206293329.
- Stark E, 2013. The dangers of dangerousness assessment. *Fam Intim. Partn. Violence Q* 6 (2), 13–22.
- Sullivan TP, Weiss NH, 2017. Is firearm threat in intimate relationships associated with posttraumatic stress disorder symptoms among women? *Violence Gend* 4 (2), 31–36. 10.1089/vio.2016.0024. [PubMed: 28616441]
- Thompson RS, Bonomi AE, Anderson M, et al., 2006. Intimate partner violence: Prevalence, types, and chronicity in adult women. *Am. J. Prev. Med* 30 (6), 447–457. 10.1016/j.amepre.2006.01.016. [PubMed: 16704937]
- Tjaden Patricia, Thoennes N, 2000. Extent, Nature, and Consequences of Intimate Partner Violence 10.1037/e300342003-001.
- Tutty L, 2015. "I Didn't Know He Had It in Him to Kill Me": Nonlethal Firearms Use and Partner Violence Against Canadian Women. *J. Forensic. Soc. Work* 5 (1–3), 130–149. 10.1080/1936928X.2015.1092906.

- Wiebe DJ, 2003. Sex differences in the perpetrator-victim relationship among emergency department patients presenting with nonfatal firearm-related injuries. *Ann. Emerg. Med* 42 (3), 405–412. 10.1016/S0196-0644(03)00509-2. [PubMed: 12944895]
- Zeoli AM, McCourt A, Buggs S, Frattaroli S, Lilley D, Webster DW, 2018. Analysis of the strength of legal firearms restrictions for perpetrators of domestic violence and their associations with intimate partner homicide. *Am. J. Epidemiol* 10.1093/aje/kwx362. Published online.
- Zeoli AM, Frattaroli S, Roskam K, Herrera AK, 2019. Removing firearms from those prohibited from possession by domestic violence restraining orders: a survey and analysis of state laws. *Trauma Violence Abuse* 20 (1), 114–125. 10.1177/1524838017692384. [PubMed: 29334003]



**Fig. 1.** Types of firearm behaviors reported by IPV victims (n = 558).  
 Note: 95% confidence intervals for these items are provided in Supplementary Table 1.

**Table 1**

Characteristics of intimate partner violence victims by experience of nonfatal firearm abuse.

	Experienced nonfatal firearm abuse ( <i>n</i> = 558)		Did not experience nonfatal firearm abuse ( <i>n</i> = 400)		Total IPV victims ( <i>n</i> = 958)	
	Weighted Proportion, % (95% CI)					
Age, years						
18–29	15.2	(11.7, 19.5)	14.5	(11.1, 18.6)	14.9	(12.4, 17.9)
30–44	25.2	(21.6, 29.2)	28.2	(23.9, 32.9)	26.4	(23.6, 29.5)
45–59	31.3	(27.2, 35.6)	24.4	(20.4, 29.0)	28.4	(25.5, 31.6)
60+	28.3	(24.5, 32.5)	32.9	(28.2, 38.0)	30.2	(27.2, 33.4)
Mean	48.9	(47.4, 50.4)	49.4	(47.6, 51.2)	49.1	(48.0, 50.3)
Gender						
Male	23.4	(19.4, 27.9)	41.9	(36.9, 47.0)	31.1	(27.9, 34.4)
Female	75.9	(71.3, 79.9)	55.4	(50.3, 60.4)	67.4	(64.0, 70.6)
Different identity <sup>a</sup>	0.7	(0.3, 1.9)	2.7	(1.4, 5.3)	1.5	(0.9, 2.7)
Race/ethnicity <sup>b</sup>						
White	70.4	(65.6, 74.8)	79.3	(74.6, 83.3)	74.1	(70.7, 77.2)
Black or African American	15.0	(11.8, 18.8)	7.8	(5.4, 11.1)	12.0	(9.8, 14.6)
Hispanic	11.7	(8.3, 16.2)	12.4	(9.0, 16.7)	12.0	(9.5, 15.0)
Asian	4.4	(2.9, 6.5)	3.1	(1.8, 5.2)	3.8	(2.8, 5.3)
Native American/Alaska Native	1.6	(0.9, 3.1)	1.5	(0.6, 3.6)	1.6	(0.9, 2.6)
All other races	1.1	(0.5, 2.3)	0.6	(0.2, 2.0)	0.9	(0.4, 1.7)
Sexual orientation						
Heterosexual, or straight	85.9	(82.2, 89.0)	86.3	(82.3, 89.5)	86.1	(83.4, 88.4)
Lesbian	1.7	(0.9, 3.1)	2.2	(1.2, 4.2)	1.9	(1.2, 3.0)
Gay	5.3	(3.3, 8.6)	3.0	(1.7, 5.3)	4.4	(3.0, 6.4)
Bisexual	6.0	(4.2, 8.4)	6.5	(4.4, 9.5)	6.2	(4.8, 8.0)
Other identity or unknown	1.1	(0.5, 2.7)	1.9	(0.8, 4.6)	1.5	(0.8, 2.7)
Current relationship status						
Married	38.5	(34.0, 43.1)	44.9	(39.9, 50.0)	41.2	(37.8, 44.6)
Divorced	21.2	(17.8, 25.0)	15.7	(12.3, 19.7)	18.9	(16.4, 21.6)
Single/never married	16.9	(13.9, 20.4)	24.0	(19.8, 28.8)	19.9	(17.3, 22.7)
Cohabiting, unmarried	12.6	(9.6, 16.4)	10.0	(7.4, 13.4)	11.5	(9.4, 14.1)
Widowed	5.8	(4.1, 8.3)	4.7	(2.9, 7.5)	5.3	(4.0, 7.1)
Separated	5.0	(3.1, 8.1)	0.8	(0.3, 2.4)	3.3	(2.1, 5.1)
Annual household income						
Less than \$20,000	24.7	(20.8, 29.2)	16.9	(13.2, 21.4)	21.6	(18.7, 24.8)
\$20,000 to \$34,999	20.8	(17.0, 25.1)	16.9	(13.2, 21.3)	19.2	(16.5, 22.3)
\$35,000 to \$49,999	15.1	(12.1, 18.7)	20.4	(16.4, 25.1)	17.2	(14.7, 20.0)
\$50,000 to \$74,999	16.7	(13.6, 20.3)	17.4	(13.7, 21.8)	17.0	(14.6, 19.7)
\$75,000 to \$99,999	10.4	(8.1, 13.2)	12.9	(9.8, 16.8)	11.4	(9.5, 13.6)

	Experienced nonfatal firearm abuse ( <i>n</i> = 558)		Did not experience nonfatal firearm abuse ( <i>n</i> = 400)		Total IPV victims ( <i>n</i> = 958)	
	Weighted Proportion, % (95% CI)					
Over \$100,000	12.2	(9.5, 15.6)	15.5	(12.1, 19.7)	13.6	(11.4, 16.1)
Highest level of education						
No HS	6.4	(3.9, 10.2)	1.3	(0.5, 3.3)	4.3	(2.7, 6.6)
High school graduate	30.8	(26.5, 35.5)	27.8	(23.4, 32.7)	29.6	(26.4, 32.9)
Some college	24.4	(20.9, 28.3)	23.8	(19.8, 28.4)	24.2	(21.5, 27.1)
2-year college	12.7	(10.2, 15.8)	13.6	(10.4, 17.7)	13.1	(11.0, 15.5)
4-year college	16.3	(13.5, 19.7)	20.8	(17.1, 25.2)	18.2	(15.9, 20.8)
Post-grad	9.4	(7.2, 12.0)	12.6	(9.6, 16.3)	10.7	(8.9, 12.8)
Region <sup>c</sup>						
Northeast	14.2	(11.2, 17.8)	18.0	(14.3, 22.4)	15.8	(13.4, 18.5)
Midwest	18.4	(15.3, 22.0)	23.4	(19.3, 27.9)	20.4	(17.9, 23.2)
South	43.2	(38.8, 47.8)	33.9	(29.2, 38.9)	39.3	(36.1, 42.7)
West	24.2	(20.3, 28.6)	24.8	(20.7, 29.4)	24.4	(21.5, 27.6)

Missing data (i.e., respondents chose 'prefer not to say'): gender (*n* = 4, <1%), race/ethnicity (*n* = 6, <1%), sexual orientation (*n* = 9, 1%), current relationship status (*n* = 16, 2%), annual household income (*n* = 62, 6%).

<sup>a</sup>Different identity includes trans male/trans man, trans female/trans woman, genderqueer/gender nonconforming, or different identity.

<sup>b</sup>Does not sum to 100% since respondents could select all that apply.

<sup>c</sup>Region was assigned based on the U.S. Census Bureau statistical regions. Northeast includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Midwest includes Illinois, Indiana, Iowa, Kansas, Michigan, Ohio, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin. South includes Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, District of Columbia, and West Virginia. West include Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.



**Table 2**

Types of intimate partner violence (IPV) by experience of nonfatal firearm abuse.

	Experienced nonfatal firearm abuse ( <i>n</i> = 558)		Did not experience nonfatal firearm abuse ( <i>n</i> = 400)		Total ( <i>n</i> = 958)	
	Weighted Proportion, % (95% CI)					
Types of IPV Experienced in Lifetime						
Physical						
Hit, slapped, kicked, or physically hurt you	78.9	(74.9, 82.4)	42.1	(37.1, 47.2)	63.7	(60.3, 66.9)
Strangled or choked you	45.7	(41.2, 50.3)	12.0	(8.9, 15.9)	31.8	(28.6, 35.1)
Sexual						
Tried to make you have sex or do something sexual you did not want to do	62.1	(57.4, 66.5)	32.0	(27.5, 36.9)	49.7	(46.2, 53.1)
Fondled, groped, grabbed, or touched you in a way that made you feel unsafe	56.3	(51.7, 60.9)	22.5	(18.5, 27.1)	42.3	(39.0, 45.8)
Psychological/Emotional & Controlling Behaviors						
Deliberately made you feel afraid	78.1	(73.7, 81.9)	35.5	(30.7, 40.6)	60.5	(57.0, 63.8)
Made you feel emotionally abused (e. g., insulted, yelled at, degraded, humiliated)	88.6	(84.7, 91.6)	73.5	(68.8, 77.8)	82.4	(79.4, 85.0)
Tried to keep you from talking to family or friends	66.1	(61.7, 70.3)	36.0	(31.3, 41.1)	53.7	(50.2, 57.0)
Controlled your ability to access money and finances	51.9	(47.3, 56.4)	20.2	(16.4, 24.7)	38.8	(35.5, 42.2)
Kept track of you by demanding to know where you were & what you were doing	80.6	(76.8, 84.0)	52.7	(47.6, 57.7)	69.1	(65.8, 72.1)
Stalked you	66.0	(61.5, 70.3)	28.8	(24.4, 33.6)	50.6	(47.2, 54.0)

**Table 3**Consequences of partner's firearm use for IPV victims who experienced nonfatal firearm abuse ( $n = 558$ ).

Consequences of nonfatal firearm abuse	Weighted proportion % (95% CI)	
Was concerned for safety	86.2	(82.6, 89.2)
Was fearful	82.7	(78.8, 85.9)
Felt constantly on guard, watchful, or easily startled	72.5	(68.1, 76.5)
Split up with partner	71.0	(66.5, 75.1)
Tried hard not to think about it or avoided situations/reminders	71.0	(66.6, 75.0)
Felt numb or detached from others, activities, or surroundings	63.2	(58.6, 67.6)
Had nightmares or thought about it when you did not want to	60.8	(56.2, 65.2)
Moved out of home	54.8	(50.2, 59.4)
Felt guilty or unable to stop blaming yourself or others for the event(s)	54.4	(49.8, 59.0)
Physical injury	43.1	(38.5, 47.9)
Missed days of work or school	37.4	(33.0, 42.0)
Called the police	29.8	(25.7, 34.3)
Sought a protective order (e.g., a restraining order)	28.6	(24.6, 33.0)
Sought legal services	27.9	(23.8, 32.3)
Reduced or eliminated internet presence (e.g., took down social media)	26.3	(22.3, 30.7)
Sought medical care	22.6	(18.7, 26.9)
Sought victim's advocate services	16.1	(12.8, 20.0)
Contacted a crisis hotline	12.8	(9.8, 16.6)
Went to a shelter	11.1	(8.1, 14.9)
How distressing partner's use of firearm was		
Not distressing	9.1	(6.7, 12.4)
Mildly distressing	16.9	(13.5, 20.9)
Moderately distressing	26.9	(22.9, 31.3)
Severely distressing	47.0	(42.3, 51.8)

Missing data (i.e., respondents chose 'prefer not to say'): concerned for safety ( $n = 11$ , 2%), fearful ( $n = 10$ , 2%), constantly on guard ( $n = 13$ , 2%), avoid situation ( $n = 14$ , 3%), split up with partner ( $n = 15$ , 3%), numb ( $n = 22$ , 4%), nightmares ( $n = 13$ , 2%), guilty ( $n = 13$ , 2%), moved out ( $n = 16$ , 3%), physical injury ( $n = 20$ , 4%), missed days ( $n = 17$ , 3%), called police ( $n = 7$ , 1%), protective order ( $n = 11$ , 2%), legal services ( $n = 12$ , 2%), internet presence ( $n = 18$ , 3%), medical care ( $n = 15$ , 3%), victim's advocate services ( $n = 14$ , 3%), crisis hotline ( $n = 12$ , 2%), shelter ( $n = 13$ , 2%), how distressing partner's use of firearm was ( $n = 42$ , 7%).