Intimate partner violence victimization and perpetration as precursors to suicide

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ABSTRACT

It remains unclear how often and under what circumstances intimate partner violence (IPV) precedes suicide. Available research on IPV and suicide focuses largely on homicide-suicide, which is a rare event (<2% of suicides). We focus instead on single suicides (i.e., suicides unconnected to other violent deaths), which are the most common type of fatal violence in the US.

Unfortunately, information about IPV circumstances is often unavailable for suicides. To address this gap, we sought to identify the proportion of single suicides that were preceded by IPV in North Carolina (NC), to describe the prevalence of IPV victimization and perpetration as precursors to suicide, and to explore how IPV-related suicides differ from other suicides. We used data from the NC Violent Death Reporting System (2010–2017, n = 9682 single suicides) and hand-reviewed textual data for a subset of cases (n = 2440) to document IPV circumstances.

We had robust inter-rater reliability (Kappa: 0.73) and identified n = 439 IPV-related suicides. Most were males who had perpetrated nonfatal IPV (n = 319, 72.7%) prior to dying by suicide. Our findings suggest that IPV was a precursor for at least 4.5% of single suicides.

Next, we conducted logistic regression analyses by sex comparing IPV-related suicides to other suicides. For both men and women, IPV was more common when the person who died by suicide had recently disclosed suicidal intent, was younger, used a firearm, and was involved with the criminal legal system, even after controlling for covariates. We also found sex-specific correlates for IPV circumstances in suicide.

Combined with homicide-suicide data (reported elsewhere), IPV is likely associated with 6.1% or more of suicides overall. Results suggest clear missed opportunities to intervene for this unique subpopulation, such as suicide screening and referral in IPV settings (e.g., batterer intervention programs, Family Justice Centers) that is tailored by sex.

1. Introduction

Suicide is among the top ten leading causes of death in the United States (US) (Heron, 2019). Suicide rates have increased precipitously in the last two decades (1999–2019), representing over a 30% increase (Centers for Disease Control and Prevention, 2020b; Stone et al., 2018). White non-Hispanic males account for the majority of suicides in the US, but in recent years, suicide rates have climbed most sharply for women and Black, non-Hispanic youth (Shain, 2019; Stone et al., 2018).

There is usually not a single "cause" for suicide, rather many factors shape suicide risk. Predisposing factors include depression, anxiety, Post-Traumatic Stress Disorder (PTSD), psychiatric comorbidities, substance use disorders, alcohol dependence, aggressiveness, impulsivity, hopelessness, and isolation (Gvion & Levi-Belz, 2018). Environmental factors, such as access to highly lethal means (Swanson, Bonnie, & Appelbaum, 2015), or knowing someone who has died by suicide (Pitman, Osborn, King, & Erlangsen, 2014), can also heighten risk. Finally, precipitating factors are defined as "the situational factors,

circumstances, or [proximal] reasons that had led the person to make the attempt" (Beautrais, Joyce, & Mulder, 1997, p. 1545). Precipitating factors for suicide include job loss, involvement with the criminal justice system, family conflict, and romantic problems (Kazan, Calear, & Batterham, 2016; Logan, Ertl, & Bossarte, 2019).

Suicide is a multi-faceted public health problem; thus evidence concerning risk factors across the individual, interpersonal, and societal levels are critical for effective prevention (Caine, Reed, Hindman, & Quinlan, 2018). Examining novel precipitating factors can help identify social contexts and subpopulations not currently addressed through conventional suicide screenings and thus inform tailored prevention strategies. Furthermore, attention to how self-directed violence and interpersonal violence overlap may elucidate further opportunities for integrated violence prevention.

1.1. Extant research on intimate partner violence and suicide

One precipitating factor for suicide that has not been adequately explored is intimate partner violence (IPV). IPV includes any physical, psychological, or sexual abuse by a current or former intimate partner (Breiding, Basile, Smith, Black, & Mahendra, 2015). In the US, over a third of adults (36.4% of women; 33.6% of men) experience IPV in their lifetimes. IPV victimization is associated with anxiety, depression, PTSD, fear or concern for safety, and physical injury (Black et al., 2011). Risk factors for experiencing IPV, either as a victim or perpetrator, include substance use, alcohol dependence, social isolation, history of childhood abuse, or witness of parental IPV (Capaldi, Knoble, Shortt, & Kim, 2012), which are also correlates of suicide (Gvion & Levi-Belz, 2018).

Researchers have documented links between IPV and suicidal thoughts/behaviors particularly among female IPV victims. For example, a systematic review determined that 11 of 13 longitudinal studies showed a significant association between IPV victimization and subsequent suicide attempts among women (Devries et al., 2013). Other research shows that one in five women who sought help for IPV disclosed that they had considered suicide before (Cavanaugh, Messing, Del-Colle, O'Sullivan, & Campbell, 2011). Such extant research, which typically uses self-reports and does not examine fatal outcomes, is limited (McLaughlin, O'carroll, & O'connor, 2012).

Other research has focused on intimate partner homicide-suicide (IPHS; i.e., an individual kills their partner and then dies by suicide within 24 hours). Unlike suicidal IPV victims, who are largely women, people who commit IPHS are almost always (95–97%) men and often have a documented history of IPV perpetration (Zeppegno et al., 2019). Some studies have found a high prevalence of non-fatal suicidal ideation among IPV perpetrators (Conner, Cerulli, & Caine, 2002; Wolford-Clevenger, Brem, Zapor, Elmquist, & Stuart, 2017), but there has been less research on IPV perpetrator suicidality beyond the context of IPHS.

To our knowledge, only one study has holistically examined IPV as a precipitating factor for suicide in the US. Brown and Seals (2019) hand-reviewed textual information from suicides in Kentucky's Violent Death Reporting System (2005–15, n = 5029) and found IPV-related suicide represented 11.4% (n = 575) of suicides overall, including homicide-suicides. Unfortunately, many cases (30%) were missing information about circumstances and thus were excluded from the study (Brown & Seals, 2019). Additional work is needed to confirm the extent to which IPV may be a precipitating factor for suicide, particularly for single suicides. A single suicide is when a suicide occurs unconnected to other violent deaths (Centers for Disease Control and Prevention, 2015, p. 14). Single suicides are the most common type of fatal violence in the US (Centers for Disease Control and Prevention, 2020a).

1.2. Purpose of this study

The present study seeks to help address these evidence gaps about the prevalence and circumstances under which IPV precipitates suicide, guided by the following research questions. In single suicide events, hereafter simply referred to simply as "suicides": (RQ1) how often is IPV a precipitating factor, and (RQ2) what was the nature of the person's involvement in IPV prior to suicide (i.e., which types of IPV were reported, how recent was the abuse, was the person a perpetrator or victim). We also ask: (RQ3) are IPV-related suicides different from other suicides, and (RQ4) how do the correlates of IPV-related suicides differ by sex?

2. Methods

We used data from the North Carolina Violent Death Reporting System (NC-VDRS, n = 9682 single suicides), which is part of the National VDRS (NVDRS), an enhanced public health surveillance system maintained by the US Centers for Disease Control and Prevention (CDC). North Carolina was among the first states to be funded for NVDRS and has been collecting data since 2004 (Jack et al., 2018). All states funded by NVDRS have trained abstractors who review reports from the coroner or medical examiner (CME), records from law enforcement (LE), and the death certificate to record known circumstances (e.g., mental health problems, past suicide attempts) for violent deaths. Circumstances are recorded as "present" or "not present/not available/unknown" for each case (Centers for Disease Control and Prevention, 2015). To supplement these fields, abstractors use open text ("death narratives") to summarize information provided by CME and LE (Centers for Disease Control and Prevention, 2015, pp. 25–26).

NVDRS abstractors in all funded states assess whether IPV contributed to a homicide (CDC, 2015, p. 80), but abstractors do not systematically record information about IPV circumstances for suicides. That means it is only possible to examine IPV as a precipitating factor for suicides that were connected to homicide events (i.e., homicide-suicides), but not for single suicides. To overcome this limitation, we hand-reviewed death narratives from single suicides to record information about IPV. We examined cases from 2010 to 2017, limiting the sample to deaths where circumstances information was available in NC-VDRS, as recommended by the Centers for Disease Control and Prevention (2015). The case inclusion criteria and identification process for IPV-related suicides are shown in Fig. 1.

The data that support the findings of this study are available on request from the North Carolina Department of Public Health. The data are not publicly available due to restrictions from the CDC.

2.1. Measures

2.1.1. IPV as a precipitating factor

We hand-reviewed CME and LE death narratives in NVDRS to determine whether IPV was mentioned as a precipitating factor in the suicide death (yes/no). It was not feasible to hand-review all suicides from the study period given the volume of cases and our limited study resources. Instead, we took a purposive sub-sample of cases that were already indicated for potential IPV based on other available, close-ended NC-VDRS variables. Specifically, we used two NC-VDRS abstractor variables to subsample cases for hand-review. The "intimate partner problems" variable indicates that some problem, such as "divorce, break-up, argument, jealousy, conflict, or [romantic] discord …" contributed to the death (Centers for Disease Control and Prevention, 2015, p. 81). The "stalking" variable records whether stalking by an intimate partner (IP), stranger, co-worker, or other acquaintance contributed to the death (Centers for Disease Control and Prevention, 2015, pp. 96–97). If either of these variables were endorsed by the abstractors, we examined the case to assess for IPV circumstances. We hoped that this purposive sampling approach would allow us to narrow our hand-review sample down to cases that were more likely to contain affirmative mention of IPV while still maximizing coverage.

Cases within our subsample (n = 2440) were divided evenly amongst four coders, with one person reviewing both CME and LE death
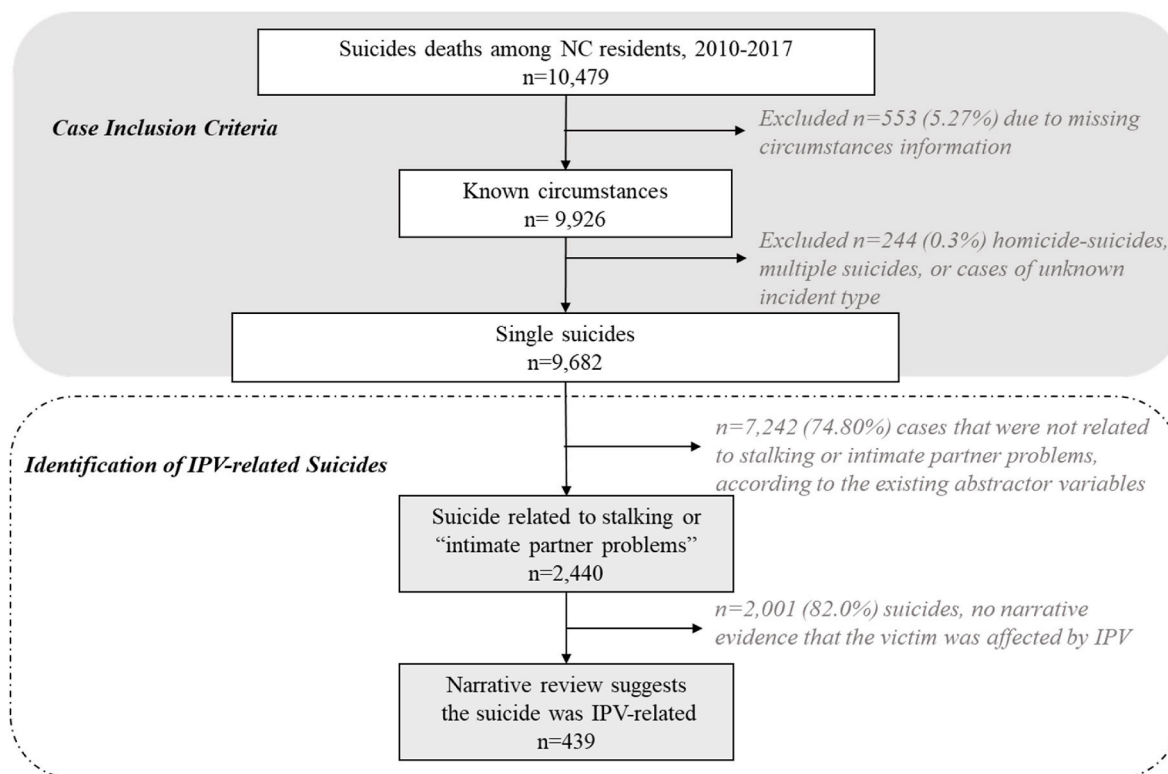
Fig. 1. Case inclusion criteria & identification process for intimate partner violence (IPV)-related single suicide events.

narratives for each assigned case. Ten percent of cases were assigned to a second coder to allow assessment of interrater reliability. Any disagreements were resolved by a third, tie-breaking vote.

We used the CDC's definition for IPV to determine whether IPV circumstances were mentioned as a precipitating factor in the death (Breiding et al., 2015), and a modified version of the coding framework used by Brown and Seals (2019). The codebook is available as an online supplement. Coders had robust inter-rater reliability as demonstrated by a Fleiss' Kappa of 0.73 (Czodrowski, 2014). Coders met weekly to debrief the coding process, additional details are described elsewhere (Kafka, Moracco, Young, Taheri, Graham et al., 2021).

While Brown and Seals (2019) considered a "domestic dispute," "domestic argument," or a "fight" between IPs as sufficient evidence of IPV, our coders were conservative in applying an IPV = yes designation. We looked for clear evidence that conflict resulted in a partner being physically injured (not self-inflicted), fearing for their safety, or taking self-protective actions like seeking a restraining order. We also looked for explicit abuse actions (hit, kicked, slapped) or clear intention to harm or intimidate an IP. We considered coercive controlling behavior as sufficient evidence of IPV (e.g., gas-lighting, excessive monitoring, humiliating or degrading an IP) (Stark, 2009) If there was only mention of "domestic violence," but it was unclear whether this occurred between IPs or other family members, we coded the case as IPV = no.

2.1.2. Decedent role in IPV

When we identified an IPV-related suicide case, we recorded whether the decedent (i.e., person who died by suicide) was described as a perpetrator of violence, a victim, or both (i.e., bilateral violence). In some cases, the narrative mentioned only that the deceased and their IP had a "history of domestic violence." In that case, role was recorded as "unknown."

2.1.3. IPV types

We recorded the type of abuse, including physical violence (e.g., hitting, beating), emotional abuse (e.g., yelling, humiliation), verbal

threats to harm/kill, illegal trespassing, sexual assault, or stalking. We used an "other abuse" category which encapsulated behaviors like kidnapping or detaining an IP against their will. When a suicide threat was communicated to manipulate, terrorize, or enact revenge on an IP, we recorded it as an abusive suicide-related threat. For example, one narrative reported, "[the decedent] wanted to have sex with his ex and [he] threatened to kill himself if she wouldn't sleep with him." Another narrative described that the decedent retrieved a pistol after an argument and told his wife that, "he was going to teach her a lesson by killing himself." If there were insufficient details in the death narrative, we recorded the IPV type as "unknown". For example, one narrative reported, "[The decedent] had recently gotten out of an abusive relationship." Note that these are composite quotes, as per CDC guidance.

2.1.4. IPV recency

If the narrative described an incident of IPV within 2 weeks of the death, we recorded this as "recent" IPV.

2.1.5. Other measures

Decedent sex is reported in NVDRS based on the death certificate, categorized as female or male. Information on gender identity and sexual orientation in NVDRS is inconsistently available and considered unreliable (Haas, Lane, Blosnich, Butcher, & Mortali, 2019), and thus was not used here. We also examine age, race/ethnicity, marital status, mental health factors, recent life stressors, and other precipitating circumstances recorded by NC-VDRS abstractors. These variables are described elsewhere (Centers for Disease Control and Prevention, 2015).

2.2. Analysis

The prevalence of IPV-related suicide was calculated based on the results of our hand-coding (RQ1). We share descriptive statistics about the types of abuse, recency, and role of the decedent (i.e., perpetrator or victim) also based on our qualitative coding (RQ2). To examine whether IPV-related suicides were significantly different from other suicides

(RQ3), we conducted chi-square tests for categorical variables and two-sample *t*-tests for continuous variables. We then conducted logistic regression analyses, using separate models by sex (RQ3, RQ4). The outcome was IPV-related (yes/no). We used 95% confidence intervals to determine significance.

3. Results

From our sample of 9682 suicides, we identified and hand-reviewed 2440 (25.2%) cases and found n = 439 suicides where IPV was described as a precipitating factor for the death (17.8% of the subsample). Qualitatively, many of these death narratives described IPV in the context of a current/pending domestic protective order; recent 9-1-1 calls about a domestic incident made by a current/former intimate partner; or were noted based on interviews with a surviving current/former intimate partner about escalating arguments or separation prior to the suicide. IPV-related suicides were most common for male suicide decedents (81.32%). See Table 1 for descriptive statistics comparing IPV-related suicides to non-IPV-related suicides.

For IPV-related suicide cases that we identified, detailed information about IPV involvement is in Table 2, stratified by sex. In most cases, a

male decedent had perpetrated nonfatal IPV (n = 319, 72.67%). Only about half of female decedents in IPV-related suicides were described as perpetrators (n = 42, 51.22%). Physical violence was the most commonly reported type of IPV (n = 213, 48.52%), followed by emotional abuse (n = 98, 22.32%). Multiple types of IPV were reported in over a quarter of cases (n = 115, 26.20%). Most death narratives described an IPV incident that had occurred within 2 weeks of the suicide (n = 323, 73.58%).

The multivariable model comparing IPV-related suicides to other suicides is in Table 3. For both men and women, there were higher odds of IPV contributing to the suicide for younger decedents. Decedents who were never married had lower odds of IPV compared to married decedents. IPV-related suicide was documented more often for decedents who identified as racial/ethnic minorities, disclosed suicidal intent in the past month, experienced criminal/legal problems, and for those who used a firearm.

There were some notable differences across the sex-stratified models. Black, non-Hispanic men (OR: 1.99, CI: 1.42, 2.78) and Hispanic men (OR: 1.94, CI: 1.11, 3.37) had higher odds of IPV circumstances compared to White, non-Hispanic men who died by suicide. Among women, belonging to an "Other" racial/ethnic group was associated

Table 1

Sample characteristics by intimate partner violence (IPV) as a precipitating factor for single suicides in North Carolina, 2010–2017.

	Full sample (n = 9682)		IPV-related (n = 439)		Not IPV-related (n = 9243)		
	n	%	n	%	n	%	*P*
Decedent demographics							
Sex							**
Male	7221	74.6%	357	81.3%	6864	74.3%	
Female	2461	25.4%	82	18.7%	2379	25.7%	
Age[a]	47.61	18.0 (10–102)	40.90	14.2 (16–102)	47.93	18.1 (10–98)	***
Race/ethnicity							***
White (non-Hispanic)	8487	87.7%	344	78.4%	8143	88.1%	
Black (non-Hispanic)	749	7.7%	57	13.0%	692	7.5%	
Hispanic	234	2.4%	20	4.6%	214	2.3%	
Other (non-Hispanic)	212	2.2%	18	4.1%	194	2.1%	
Marital status:							***
Married/Civil Union	3641	37.6%	193	44.0%	3359	36.3%	
Divorced or separated	2468	25.5%	108	24.6%	2334	25.3%	
Never married	2895	29.9%	78	17.8%	1777	19.2%	
Widowed	622	6.4%	7	1.6%	615	6.7%	
Unknown	56	0.6%	3	0.7%	52	0.6%	
Past suicidality and disclosure							
History of suicide attempts	1617	16.7%	79	18.0%	1538	16.6%	
Disclosed suicide plan (past month)	2664	27.5%	203	46.2%	2461	26.6%	***
Decedent left a suicide note	3060	31.6%	99	22.6%	2961	32.0%	***
Mental/behavioral health factors							
Depressed suspected[b]	3395	35.1%	115	26.2%	3280	35.5%	***
Alcohol dependency suspected[b]	1498	15.5%	106	24.2%	1392	15.1%	***
Other substance use disorder suspected[b]	1550	16.0%	102	23.2%	1448	15.7%	***
Currently diagnosed behavioral/mental health problem	5006	51.7%	206	46.9%	4800	51.9%	*
Treatment history for behavioral/mental health problem	4979	51.4%	198	45.1%	4781	51.7%	**
Other life circumstances							
Physical health problems	2156	22.3%	30	6.8%	2126	23.0%	***
Job problems	817	8.4%	28	6.4%	789	8.5%	
Financial problems	597	6.2%	15	3.4%	582	6.3%	*
Criminal legal problems	745	7.7%	102	23.2%	643	7.0%	***
Civil legal problems	257	2.7%	23	5.2%	234	2.5%	***
Incident characteristics							
Weapon (primary)							***
Firearm	5455	56.3%	287	65.4%	5168	55.9%	
Hanging, strangulation	2084	21.5%	105	23.9%	1979	21.4%	
Poisoning	1712	17.7%	34	7.7%	1678	18.2%	
Other	295	3.1%	12	2.7%	283	3.1%	

In this table we conducted bivariate tests only, ***p < .001, **p < .01, *p < .05, .p < .1.

[a] Showing mean, standard deviation (range) for continuous variables.

[b] As perceived by the decedent or others.

Table 2
Detailed characteristics of intimate partner violence (IPV)-related single suicides (n = 439), North Carolina, 2010–2017.

	All (n = 439)		Males (n = 357)		Females (n = 82)	
	n	%	n	%	n	%
Decedent role						
IPV perpetrator	361	82.2%	319	89.4%	42	51.2%
IPV victim	34	7.7%	12	3.4%	22	26.8%
Both IPV victim and perpetrator	5	1.1%	4	1.1%	1	1.2%
Unknown	39	8.9%	22	6.2%	17	20.7%
Type of IPV recorded						
Physical violence	213	48.5%	167	46.8%	46	56.1%
Emotional abuse	98	22.3%	83	23.3%	15	18.3%
Suicide threats	92	21.0%	79	22.1%	13	15.9%
Threats to harm/kill	72	16.4%	64	17.9%	8	9.8%
Trespassing	13	3.0%	13	3.6%	0	0%
Sexual assault/rape	5	1.1%	5	1.4%	0	0%
Stalking	5	1.1%	3	0.8%	2	2.4%
Other	2	0.5%	1	0.3%	1	1.2%
Unknown	72	16.4%	59	16.5%	13	15.9%
Multiple types reported	115	26.2%	100	28.0%	15	18.3%
Recent IPV event (~2 weeks)	323	73.6%	272	76.2%	51	62.2%

with higher odds of IPV circumstances (OR: 2.81, CI: 1.48, 5.34), although few IPV-involved women identified as "other" race/ethnicity in our sample (n = 18). For men, suspected alcohol dependency was associated with higher odds of IPV circumstances (OR: 1.45, CI: 1.10, 1.91), but suspected depression (OR: 0.67, CI: 0.51, 0.87), physical health problems (OR: 0.33, CI: 0.21, 0.52), or financial problems (OR: 0.43, CI: 0.22, 0.83) were associated with lower odds of IPV circumstances in the death. Among women, having a potential substance use disorder (OR: 1.73, CI: 1.28, 2.33) or involvement with the civil legal system (OR: 2.88, CI: 1.66, 5.02) were associated with higher odds of IPV cicrumstances.

4. Discussion

We found evidence of IPV circumstances in n = 439 suicide cases, representing 4.53% of all single suicide events during the study period (n = 9682). There were also n = 167 IPV-related homicide-suicides documented during this period, which are reported elsewhere (Kafka et al., 2021). Together, these findings suggest that IPV may be a precipitating factor for 6.1% of suicides overall in North Carolina (n = 606 of 9926). This estimate is more modest than the findings of Brown and Seals (2019) likely because we used a more conservative case definition, and because many cases in the Brown and Seals sample (30%) were dropped due to missing circumstances information. Nonetheless, we successfully replicated their hand-coding process, demonstrating feasibility and scalability for documenting IPV as key suicide circumstances in NVDRS. The CDC should consider amending their NVDRS coding process to promote assessment of IPV circumstances in suicide cases.

Applied nationally, our NC results suggest that every year there could be over 2900 IPV-related suicides in the US, which is comparable to the number of intimate partner homicides (IPH, n = 2237) reported annually (Fridel & Fox, 2019). Given such a high potential magnitude, it is imperative we understand who is impacted by IPV-related suicide and how to engage these individuals and their partners in both IPV and suicide prevention. Thus, we call for further study to replicate and extend our findings. One such project is already underway (Graham et al., 2021).

4.1. IPV perpetration and victimization prior to suicide

Our results suggest that many IPV perpetrators die by suicide. In fact, the clear majority of suicide decedents (>80%) who were involved in

IPV prior to their suicide had recently perpetrated nonfatal IPV. While extensive attention has been paid to suicide risk among IPV victims, little research has focused on this link for (non-homicidal) IPV perpetrators (McLaughlin et al., 2012). A systematic review by Sesar, Dodaj, and Šimić (2018) did identify nine studies that examined the association between IPV perpetration and nonfatal suicidal behaviors using community and clinical samples, and six of the nine studies reported significant results.

Some consideration of the mechanisms which link IPV to suicide may be merited. In our qualitative reading of the NVDRS abstracts, we found that suicide was often an impulsive response to acute strain or conflict in an already abusive relationship. Similarly, Dewar, Heggs, and Davies (2021) conducted interviews with imprisoned domestic violence perpetrators and found that they tended to use nonfatal suicidal behaviors as a coping strategy to deal with overwhelming negative emotions, particularly in response to relationship stressors.

According to the Cognitive-Emotional Model of Dual-Harm, individuals who engage in both interpersonal and self-directed violence have unique characteristics compared to individuals who engage in only one of those behaviors (Shafti, Taylor, Forrester, & Pratt, 2021). Dual-harm most often occurs among men who are highly impulsive, have poor self-regulation, and use maladaptive coping mechanisms (such as substance use) to deal with interpersonal stress (Shafti et al., 2021). Our examination of the correlates for IPV circumstances among men who die by suicide largely suggest a profile that is consistent with this description.

According to the literature base, IPV could be both a cause and/or a consequence of suicidal thoughts or suicidal behaviors. There are some common neurobiological patterns observed for aggression and suicidality, particularly related to altered brain serotonin-mediated neurotransmission (Bortolato et al., 2013; Conner, Duberstein, Conwell, & Caine, 2003). IPV perpetration and suicide also share risk factors including exposure to early adversity (such as witnessing parental IPV or being a victim of violence themselves), substance use, impulsivity, and mental health problems (Birkley & Eckhardt, 2015; Clare et al., 2021; Gvion & Levi-Belz, 2018). These precursors could increase risk for IPV perpetration and suicide independently. Alternatively, a complex interplay of these factors could casually link IPV exposure to subsequent suicidal behaviors, or vice versa (Bossarte, Simon, & Swahn, 2008; Cerulli, Stephens, & Bossarte, 2014; Swahn et al., 2008).

Regardless of the underlying causal mechanisms, our data do show that IPV precedes a significant proportion of suicides, suggesting clear opportunities for intervention. For example, lethality assessments such as the *Danger Assessment* ask victims whether their abusive partner has threatened suicide, but this information is used only to inform safety planning for the IPV victim (Messing, Campbell, & Snider, 2017). There is rarely any follow-up with the abusive partner to address suicidality (Juodis, Starzomski, Porter, & Woodworth, 2014; Ranasinghe, 2019). Given our findings, IPV perpetrators are likely at high risk both for dying by suicide and for killing a partner (Campbell et al., 2003). Safety planning for IPV victims should always be paramount, but in addition, we have the opportunity to adapt existing assessments which already ask about IPV perpetrator suicide threats and apply them to suicide screening and intervention. Additionally, using more holistic and trauma-informed approaches for batterer intervention programs that integrate suicide prevention efforts could help improve effectiveness of these interventions while also engaging IPV perpetrators in services (Voith, Logan-Greene, Strodthoff, & Bender, 2020).

4.2. Correlates of IPV-related suicides

Our findings suggest that decedents who experienced IPV circumstances differed from other decedents in single suicides. IPV circumstances were more commonly indicated for decedents who were younger, married, involved in the criminal legal system, had recently disclosed suicidal intent, and who used a firearm, even after controlling

Table 3

Correlates of intimate partner violence (IPV)-related single suicide compared to other single suicide events, North Carolina, 2010–2017.

	Males (n = 7177)			Females (n = 2449)		
	OR	95% CI	P	OR	95% CI	P
Demographics						
Age (per year)	0.99	(0.97, 0.99)	***	0.95	(0.93, .97)	***
Race/ethnicity						
White (non-Hispanic)	ref			ref		
Black (non-Hispanic)	2.0	(1.4, 2.8)	***	0.9	(0.3, 2.6)	
Hispanic	1.9	(1.1, 3.4)	*	1.2	(0.3, 4.3)	
Other (non-Hispanic)	1.8	(1.0, 3.4)	.	2.8	(1.1, 7.3)	*
Marital status						
Married	ref			Ref		
Divorced	0.8	(0.6, 1.1)		0.7	(0.4, 1.2)	
Never married	0.4	(0.3, 0.5)	***	0.3	(0.2, 0.7)	**
Widowed	0.5	(0.2, 1.0)	.	0.2	(0.0, 1.5)	
Past suicidality and disclosure						
History of suicide attempts	1.0	(0.7, 1.4)		1.7	(1.02, 2.8)	*
Disclosed suicide plan (past month)	2.2	(1.7, 2.7)	***	2.9	(1.8, 4.7)	***
Left a suicide note	0.7	(0.5, 0.9)	**	1.0	(0.6, 1.6)	
Mental/behavioral health factors						
Depression suspected[a]	0.7	(0.5, 0.9)	**	0.7	(0.4, 1.1)	
Alcohol dependency suspected[a]	1.5	(1.1, 1.9)	**	1.8	(0.98, 3.2)	.
Other substance use disorder suspected[a]	1.3	(0.9, 1.7)		1.7	(1.03, 2.9)	*
Currently diagnosed behavioral/mental health problem	0.4	(0.2, 1.1)	.	0.4	(0.1, 1.6)	
Treatment history for behavioral/mental health problem	2.1	(0.9, 4.9)		3.4	(0.8, 14.6)	
Other life circumstances						
Physical health problems	0.3	(0.2, 0.52)	***	0.5	(0.2, 1.2)	
Job problems	0.7	(0.4, 1.1)	.	1.1	(0.4, 2.8)	
Financial problems	0.4	(0.2, 0.8)	*	1.5	(0.5, 4.1)	
Criminal legal problems	2.8	(2.2, 3.7)	***	3.2	(1.5, 6.7)	**
Civil legal problems	1.5	(0.9, 2.6)		2.9	(1.2, 7.1)	*
Incident characteristics						
Weapon						
Firearm	1.7	(1.3, 2.2)	***	1.8	(1.4, 2.3)	*
Non-firearm	ref			ref		

Table shows results from multivariable logistic regression analyses and presents adjusted Odds Ratios (ORs).

***p < .001, **p < .01, *p < .05, .p < .1.

Note: Individuals with unknown marital status were dropped from the model (n = 56).

[a] As perceived by the decedent or other.

for covariates. There are a few plausible explanations for these findings. First, risk for nonfatal IPV victimization and perpetration is elevated among youth and young adults (Capaldi et al., 2012; Rennison, 2001), and could have a particularly pronounced impact on suicidality. Second, married individuals may face legal or economic obstacles for leaving an abusive relationship or interrupting entrenched patterns of violence. Decedents who experienced IPV may also be involved in the criminal legal system related to litigation for ongoing abuse or for unrelated crimes. Altogether, our exploratory study suggests that individuals who were impacted by IPV circumstances are different than other suicide descendants in meaningful ways that hold important implications for prevention.

We also saw notable differences in the prevalence of IPV-related suicide for certain racial/ethnic groups. The adjusted odds of IPV involvement prior to suicide was significantly elevated for Black (non-Hispanic) men, Hispanic men, and non-Hispanic women of "other races," compared to their White non-Hispanic counterparts. Past research has consistently shown that racial/ethnic minority women are disproportionately affected by IPV (Cho, 2012), but there has been less examination of the prevalence of IPV among men. According to the National Intimate Partner and Sexual Violence Survey, the estimated prevalence of IPV among men in the US was highest among Black non-Hispanic men (36.3%), but comparable for White non-Hispanic and Hispanic men (28.2% and 26.6% respectively, Black et al., 2011), although some of these differences may be driven by socio-economic

factors (Taft, Bryant-Davis, Woodward, Tillman, & Torres, 2009). Still, racial disparities in IPV involvement are well-documented and may influence suicide outcomes. Accordingly, it is imperative to prioritize provision of accessible, culturally competent, and appropriate mental and behavioral health treatments to support diverse populations.

Decedents impacted by IPV also disclosed suicidal intent in the past month more often than other suicide decedents, suggesting potential missed opportunities to intervene. Suicide screening may be appropriate in IPV-related contexts such as domestic violence court, batterer intervention programs, and other criminal/civil legal settings. Furthermore, we found IPV was described in 18.06% of cases where "IP problems" were recorded in NC-VDRS. When individuals disclose romantic problems in mental health settings, it may be important to screen for IPV as well as suicidality.

Firearms were also more commonly used in IPV-related suicide than other suicides. There are already mechanisms in place to restrict access to firearms for IPV perpetrators. For example, federal law (Gun Control Act, 1968; Violence Against Women, 1994; Lautenberg Amendment; 1996) prohibits the purchase and possession of firearms by persons subject to certain domestic violence misdemeanors and for qualifying domestic violence protective orders (DVPOs). Zeoli et al. (2018) found that US states that augment federal law with additional DVPO firearm relinquishment laws have lower rates of IPH. Ensuring thorough implementation of IPV-related firearm laws might have spillover effects for decreasing suicide risk.

There were also important sex-specific correlates of IPV-related suicide. Among male decedents, IPV circumstances were associated with alcohol use but negatively associated with depression and other adverse life circumstances like physical health or financial problems. Accordingly, IPV-related suicide among men might occur absent of some other precipitating factors or emotional states that are conventionally linked to suicide. Among female decedents, IPV was associated with a history of suicide attempts and potential substance use disorders. It is unclear whether IPV amplifies these correlates or whether they tend to coincide for IPV-involved women. In summary, our results suggest that there may be a different constellation of risk factors that converge with IPV and suicide for men and women respectively. Thus, outreach and support for IPV-involved suicidal individuals could be tailored by sex.

4.3. Limitations

There are some limitations to using NVDRS data. First, data are compiled from local death investigations by coroners/medical examiners (CME), and law enforcement (LE) agencies. Thus, there may be variation in data quality by agency, jurisdiction, or case-specific factors (NIST, 2021). We used data only form one state, which may help address some of this potential variability. Second, NVDRS abstractors summarize CME and LE reports for the official NVDRS death narratives, but they are not necessarily trained to document IPV in their write-ups. Thus, there may be considerable variation in the detail of information about IPV circumstances based on the discretion and approach used by different NVDRS abstractors at the state-level.

Our enumeration of IPV-related suicides is likely an underestimate. In addition to potential underreporting by CME, LE, and NVDRS abstractors, we used a conservative case definition during hand-coding to determine IPV circumstances; if vague terms such as "domestic violence" were mentioned without further specification as to whether the violent incident occurred among current/former intimate partners verses among other (non-intimate partner) family members, then we coded it as IPV = no. We also only performed hand-review for cases where NC-VDRS had already noted that the death was connected to "intimate partner problems" or "stalking" in a close-ended data entry field. These methodological decisions undoubtedly caused us to miss cases of IPV-related suicide, however, a strength of this study is that we conducted detailed hand-review for thousands of cases, and with robust inter-rater reliability, we were confident in the determination of positive cases.

For IPV-related suicides, the role of the decedent as a victim or perpetrator was not always clear in the NVDRS death narratives. Thus, we examined overall IPV involvement in our multivariable model, regardless of victimization/perpetration status. Future research should examine correlates that influence suicide for IPV perpetrators compared to IPV victims.

Most instances of IPV that were described in the death narratives occurred within 2 weeks of the death. It is plausible that IPV incidents and acute suicidal crises coincide in close temporal proximity to each other. It is also possible, however, that distal IPV is not often recorded during death investigations or mentioned in NVDRS death narratives.

We only conducted analyses on single suicide events. We believe this is still an important contribution to the literature as single suicides are the most common type of suicide incident (>98%), and they have been historically overlooked in past IPV research studies. It is possible, however, that the correlates of IPV-related suicide may differ in the context of homicide-suicide. Future research should examine this issue.

4.4. Recommendations for data collection and surveillance

Introducing streamlined protocols for documenting IPV circumstances during suicide death investigations may be one remedy to address inconsistencies in reporting. For example, CME or LE agencies could introduce systematic probes to ask about IPV during death investigation interviews if the suicide occurred in connection to a known domestic conflict or was witnessed by an intimate partner. If the local LE agency responded to IPV-related crisis calls, this would also be useful for LE to disclose in their reports to NVDRS. Compiling and sharing data from CME and LE death investigations, however, can be complicated and burdensome for local agencies (NIST, 2021). An alternative is for researchers to consider linking NVDRS data at the state-level to law enforcement records to ascertain whether suicide decedents were involved in any IPV-related civil or criminal cases prior to the death. Qualitative research could also be conducted with surviving family, friends, or dating partners after a suicide to help confirm or expand upon observed findings from the present study. Finally, as mentioned previously, it would be important for CDC to consider amending NVDRS coding guidance to encourage abstractors to systematically document IPV circumstances in suicide deaths using close-ended data fields.

5. Conclusion

IPV was a precipitating factor for 4.5% of single suicide events. Combined with homicide-suicide data, this suggests IPV is a precursor for 6.1% of suicides overall. According to other recent analyses of NVDRS data, this is comparable to the proportion of suicides in the US that are precipitated by chronic pain (8.8%), job problems (6.4%), or eviction (3.8%) (Petrosky et al., 2018; Stone et al., 2018). While IPV has historically been overlooked as a precipitating factor for suicide, it is important that we improve our capacity to monitor the role of IPV circumstances in suicide so that we can identify appropriate avenues for prevention and intervention, including work engaging perpetrators of IPV. Developing IPV-specific suicide screening and treatment that is tailored by sex could help prevent negative outcomes.

Ethical statement

This study did not involve subject participation or ethical issues. This project uses de-identified data and was deemed non-human subjects research by the Institutional Review Board at the University of North Carolina, Chapel Hill.

CRediT authorship contribution statement

Julie M. Kafka: Conceptualization, Data curation, Methodology, Formal analysis, Project administration, Writing – original draft. **Kathryn (Beth) E. Moracco:** Conceptualization, Data curation, Supervision, Writing – review & editing. **Caroline Taheri:** Data curation, Writing – review & editing. **Belinda-Rose Young:** Data curation, Writing – review & editing. **Laurie M. Graham:** Conceptualization, Writing – review & editing. **Rebecca J. Macy:** Writing – review & editing. **Scott Proescholdbell:** Resources, Writing – review & editing.

Declaration of competing interest

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Appendix A. Codebook for recording IPV circumstances

The codebook used during hand-coding for documenting IPV circumstances can be found online at https://doi.org/10.1016/j.ssmph.2022.101079.

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