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Hospital visit histories of suicide decedents: a study in Utah

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ABSTRACT

The study aims to describe the 3-year hospital visit histories of suicide decedents in Utah grouped by the suicide method they used. Hospital visit histories from the Utah Office of Health Care Statistics were linked to a census of suicide mortality data from the National Violent Death Reporting System in 2014 and 2015. Overall, 14% of suicide decedents had visited a hospital for deliberate self-harm (DSH) and 49% for a behavioural health issue (BHI), including DSH, suicidal ideation, mental health and substance abuse, prior to their death. Firearms suicide decedents made up over half of all suicides but were the least likely to have a history of DSH or BHI prior to their death (8% and 41%, respectively). Few suicide decedents visited a hospital for DSH prior to their death, although half had visits for BHI. Hospital-based interventions that aim to prevent suicide should not be limited to visits for DSH.

INTRODUCTION

Previous research has shown that, among those who died by suicide, healthcare utilisation in the time leading up to their death is common.[1–8]

Several studies in the US have found similar results after examining healthcare utilisation across outpatient, inpatient and emergency settings.[2–4 8] Among these, only one study examined the differences in utilisation by method of suicide and did so across only two categories of suicide methods, 'violent' and 'non-violent', rather than differentiating more finely as between firearms and hanging, or poisoning and cutting.[2] Most studies examined broadly whether or not suicide decedents were seen in a clinical setting and, frequently as well, whether they were seen for mental health diagnoses. Only one study examined in further detail if visit history among suicide decedents included deliberate self-harm (DSH), suicidal ideation, substance abuse or other relevant diagnoses (and did so for a look-back period of 6 weeks).[4]

This study uses 3 years of hospital visit data from a census of suicide decedents to examine hospital utilisation by means of suicide and by visit type. We focus on differences in the decedents' means of suicide in relation to prior visits and differentiate the types of visits in ways that may prove pertinent to identifying patients that should be targeted by hospital-based interventions like lethal means counselling, an intervention supported by multiple medical societies that involves reducing suicide risk by reducing access to highly lethal methods like firearms.[9–11]

METHODS

Data

Data for this study come from a data linkage project (described more fully elsewhere).[12] All deaths by suicide that occurred within Utah in 2014 and 2015 were identified by the Office of the Medical Examiner (OME) and deterministically linked by the Utah Office of Health Care Statistics (OHCS) Facilities Database. The OHCS provided data for every hospital visit made by suicide decedents from 2011 through their date of death in 2014 or 2015. Only quarter of visit, not specific date of visit, was provided; to standardise the time period for which there were data on hospital visit history, any visits falling outside of the 3 years prior to the quarter of a decedent's death were not included in the analyses for this study. The OME linked each decedent to their corresponding record in the National Violent Death Reporting System (NVDRS); information on decedent demographics, date of death and suicide method came from the NVDRS.

Types of visits

Hospital visits included both emergency department and inpatient visits. Types of hospital visits were classified based on the International Classification of Diseases (ICD) codes present in the healthcare facilities data in the following fields: patient reason for visit, admitting diagnosis code, principal diagnosis code, secondary diagnosis code and external cause of injury code ('e-code'). Using the ICD codes in these fields, visits were classified into the following categories: DSH, suicidal ideation, mental health, substance abuse, behavioural health issue (BHI) (defined as any of the preceding categories) and non-BHI. DSH visits were further classified by the method involved in the self-harm (ie, firearms, suffocation, drug poisoning, sharps and other). In instances in which multiple methods were used in a DSH, the DSH visit was assigned the method with the highest mortality rate.[13] Due to the incorporation of ICD10 coding during the study interval, both ICD9 and ICD10 codes were used to make classifications (online supplemental appendix table).

Analyses were conducted in Stata V.17.1.

RESULTS

The OME identified 1182 individuals who died by suicide in Utah from 2014 through 2015 (table 1). Among these, half died by firearms (591), 290 died by suffocation (including hanging, ligature and other asphyxiation), 199 died by drug poisoning

Table 1 Characteristics and 3-year hospital visit history of Utah suicide decedents in 2014–2015

	Overall		Method used in suicide							
			Firearms		Hanging		Drug poisoning		Other	
	n	Prop (%)	n	Prop (%)	n	Prop (%)	n	Prop (%)	n	Prop (%)
Overall	1182		591		290		199		102	
Demographics										
Gender										
Male	886	75.0	519	87.8	212	73.1	75	37.7	80	78.4
Age										
<18	77	6.5	35	5.9	37	12.8	2	1.0	3	2.9
18–29	250	21.2	129	21.8	71	24.5	26	13.1	24	23.5
30–44	360	30.5	151	25.6	103	35.5	63	31.7	43	42.2
45–59	297	25.1	150	25.4	56	19.3	70	35.2	21	20.6
≥60	198	16.7	126	21.3	23	7.9	38	19.1	11	10.8
Race/ethnicity*										
Non-Hispanic white	1062	90.0	564	95.4	230	79.9	183	92.0	85	83.3
Non-Hispanic other	57	4.8	12	2.0	28	9.7	9	4.5	8	7.8
Hispanic	61	5.2	15	2.5	30	10.4	7	3.5	9	8.8
Three-year hospital visit history										
Seen for deliberate self-harm	161	13.6	46	7.8	43	14.8	52	26.1	20	19.6
Seen for deliberate self-harm by method†										
Firearm	10	6.2	9	19.6	1	2.3	0	0.0	0	0.0
Suffocation	21	13.0	0	0.0	17	39.5	3	5.8	1	5.0
Drug poisoning	98	60.9	21	45.7	17	39.5	44	84.6	16	80.0
Sharps	39	24.2	15	32.6	11	25.6	10	19.2	3	15.0
Other	23	14.3	3	6.5	10	23.3	5	9.6	5	25.0
Seen for suicidal ideation	220	18.6	73	12.4	58	20.0	54	27.1	35	34.3
Seen for deliberate self-harm and/or suicidal ideation	281	23.8	94	15.9	75	25.9	74	37.2	38	37.3
Seen for mental health	457	38.7	183	31.0	109	37.6	115	57.8	50	49.0
Seen for substance abuse	396	33.5	165	27.9	95	32.8	97	48.7	39	38.2
Seen for behavioural health issue‡	580	49.1	241	40.8	141	48.6	139	69.9	59	57.8
Seen for only non-behavioural health issue	200	16.9	118	20.0	48	16.6	25	33.3	9	11.3
Seen for any reason (last 3 years)	780	66.0	359	60.7	189	65.2	164	82.4	68	66.7

*Missing race for two decedents.
†Percentages among those with deliberate self-harm history.
‡Behavioural health issue includes deliberate self-harm/suicidal ideation/mental health/substance abuse.
Prop, proportion.

and the remaining 102 died by other means (table 1). Males made up the majority of suicide deaths overall (75%) and from firearms (88%), suffocation (73%) and other means (78%) (table 1). Females made up the majority of suicide deaths from drug poisoning (62%) (table 1).

Only 14% of suicide decedents were seen in the hospital for DSH prior to their death (table 1). Firearms decedents were the least likely to have been seen for DSH (8%); drug poisoning decedents were the most likely (26%) (table 1). Among those with a DSH visit history, most used drug poisoning (61%) at least once and 24% used sharps at least once. The least common method used in a previous DSH visit was firearms (6%) (table 1).

About one in five suicide decedents were seen for suicidal ideation, and 24% had a history of ideation and/or DSH (table 1). Firearms decedents were least likely to have been seen for suicidal ideation (12%) (table 1).

Overall, about 39% of decedents were seen for a mental health visit (table 1). Drug poisoning decedents were the most likely to have been seen (58%) and firearms decedents were the least likely (31%) (table 1). The results were similar for substance abuse visits, where about a third of decedents were seen overall, and firearms decedents were the least likely (28%), while drug poisoning decedents were the most likely (49%) (table 1).

About half of suicide decedents were seen for BHI (includes DSH, suicidal ideation, mental health and/or substance abuse) (table 1). Drug poisoning decedents were most likely to be seen (70%), while firearms decedents were least likely (41%) (table 1). Only 17% of decedents had hospital histories that involved exclusively non-BHI (table 1).

Overall, two-thirds of suicide decedents were seen in the hospital for any reason (ie, including non-behavioural medical reasons) (table 1). Those who died by drug poisoning were the most likely to have a hospital visit for any reason in the past 3 years (82%) and those who died by firearms were the least likely (61%) (table 1).

DISCUSSION

Consistent with prior studies, we found that healthcare utilisation was common among those who died by suicide in the time leading up to their death.[1–8] Two-thirds of decedents had at least one hospital visit prior to their death, and overall healthcare utilisation varied by suicide method, with 82% of poisoning decedents compared with 61% of firearms decedents having been seen in the hospital, consistent with findings from prior work (table 1).[2 7] Differences in prior hospital use by method of suicide were more pronounced for visit types recognised as risk factors for suicide. For example, firearms

decedents were the least likely to be seen for issues relating to DSH (8%), suicidal ideation (12%), mental health (31%), substance abuse (28%) and BHI (41%) (table 1). Decedents of drug poisonings were the most likely to be seen for most visit types, including DSH (26%), mental health (58%), substance abuse (49%) and BHI (70%) (table 1).

These findings have implications for hospital-based interventions like lethal means counselling. For example, the large proportion of decedents, particularly firearms decedents, who did not make it to the hospital prior to their death for a condition recognised as placing patients at heightened risk of suicide is evidence that community-level prevention efforts are needed to complement hospital-based efforts. In addition, our findings suggest that targeting only patients with suicidal ideation or DSH would have substantially reduced the ability of an intervention to reach suicide decedents, especially firearms decedents, prior to death. Lastly, when patients present with a suicide attempt, it is important to deliver firearms-related prevention messages and assistance to those who make an attempt with non-firearms means, as nearly all firearms decedents with a prior DSH attempt in our study had attempted with a non-firearm method (94%) (table 1).

Limitations

Findings should be interpreted with at least three limitations in mind. First, all subjects in this descriptive case-only study are dead. Accordingly, we do not address clinically relevant questions about how many patients presenting to the hospital with mental health conditions or DSH go on to die by suicide, or the effectiveness of existing lethal means counseling (LMC) interventions. Second, these results are specific to a census of a single state, Utah, in 2014–2015, and thus may not be generalisable to other places or time. Finally, the measure of healthcare utilisation in this study was hospital visits, not outpatient care or care received elsewhere.

CONCLUSION

It is important to consider that many high-risk individuals, like firearms suicide decedents, will not interact with a hospital in the time before their death and that even fewer will present with suicidal ideation or DSH. Additionally, hospital interventions that target reducing access to firearms should target all patients with BHI, not only those with DSH involving firearms as nearly all firearms decedents in this study with a DSH history attempted previously with a non-firearm method. Given that nearly half of all suicides in the US are firearms suicides, these observations help define the limits and opportunities for hospital-based prevention efforts and underscore the additional need for effective prevention efforts elsewhere in the community.

What is already known on the subject

⇒ Broadly, suicide decedents are seen in the hospital and other healthcare settings prior to their death.
⇒ Broadly, suicide decedents are seen for mental health prior to death.

What this study adds

⇒ While suicide decedents are seen in the hospital prior to death, relatively little is known about how the proportion of those seen and the types of visits for which they are seen may vary by method of suicide.
⇒ By method, firearms decedents, who represent half of all suicide decedents, are seen the least overall and are the least likely to have been seen for deliberate self-harm (DSH) and/or suicidal ideation prior to their death.
⇒ Among suicide decedents with a history of DSH, previous DSH methods were rarely the same as the method used in suicide, particularly among firearms suicide decedents.

Correction notice This article has been corrected since it was first published. The open access licence has been updated to CC BY.

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