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Lethal means assessment and counseling in the emergency department: Differences by provider type and personal home firearms

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Abstract

OBJECTIVE: This study examined emergency department (ED) and behavioral health (BH) provider attitudes and behaviors related to lethal means screening and counseling of patients with suicide risk, specifically examining differences by provider type and whether providers had firearms in their own home.

METHODS: ED providers (physicians and midlevel practitioners) and behavioral health (BH) providers at four Colorado EDs completed an anonymous, web-based survey.

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RESULTS: Fewer ED providers (35%) than BH providers (81%) felt confident in their ability to counsel patients about lethal means (P<.001). In multivariable analysis, the only clinical or provider factor associated with often or almost always asking patients about firearm access was provider type, with BH providers more likely than ED providers to ask in all scenarios (OR: 5.58, 95% CI 1.68–18.6). Behaviors and attitudes about lethal means counseling did not vary by whether the provider had firearms at home. Almost all providers said that additional training and protocols about how to help patients make firearm storage decisions would be helpful.

CONCLUSIONS: Gaps in ED-delivered lethal means counseling persist, highlighting directions for future provider education and protocol development.

INTRODUCTION

Many suicides are preventable - less than ten percent of people who survive an initial suicide attempt die by a subsequent attempt within the next ten years (Carroll, Metcalfe & Gunnell, 2014; Owens, Horrocks & House, 2002). This highlights the importance of intervening during high risk periods, especially to prevent attempts with highly lethal methods like firearms. Emergency departments (EDs) are a key site for such intervention, as 39% of suicide decedents visit an ED in the year prior to their death (Ahmedani, Stewart, Simon, Lynch, Lu et al., 2015; Gairin, House & Owens, 2003). Yet while most (81–91%) non-mental health ED providers (e.g., emergency nurses) are confident in their skills to screen for suicidal ideation, fewer are confident in their ability to assess risk severity, counsel patients, or create safety plans (Betz, Arias, Miller, Barber, Espinola et al., 2015; Betz, Sullivan, Manton, Espinola, Miller et al., 2012).

This lack of confidence in safety planning is particularly problematic for efforts to reduce access to lethal means, including firearms. Firearms have the highest case-fatality rate of all suicide methods (Conner, Azrael & Miller, 2019). Homes with firearms have higher rates of suicide than those without (Brent & Bridge, 2003), despite similar rates of mental illness in homes with and without firearms (Betz, Barber & Miller, 2011; Mann, Apter, Bertolote, Beautrais, Currier et al., 2005; Miller, Barber, Azrael, Hemenway & Molnar, 2009). Multiple public health and medical organizations have recommended lethal means reduction approaches, particularly regarding firearm access, as part of a comprehensive suicide prevention strategy and a standard of care (Capoccia & Labre, 2015). Precise estimation of risk of imminent suicide remains difficult, even among ED patients, but current recommendations support environmental assessment and lethal means counseling for all ED patients with suicidal thoughts or behaviors, especially those discharged home (Capoccia & Labre, 2015; Joint Commission, 2015).

Patients are receptive to lethal means counseling and may reduce access to firearms when counseled to do so (Kruesi, Grossman, Pennington, Woodward, Duda et al., 1999; Rowhani-Rahbar, Simonetti & Rivara, 2016; Runyan, Becker, Brandspigel, Barber, Trudeau et al., 2016). However, several barriers limit ED providers' provision of lethal means counseling. With the exception of dedicated behavioral health specialists working in the ED (Betz, Barber & Miller, 2010), few ED providers believe that reducing access to lethal means can prevent suicide or that providing such counseling is within their role. Most ED providers

only discuss reducing firearm access with patients who disclose a suicide plan specifically involving a firearm (Betz, Miller, Barber, Beaty, Miller et al., 2016; Betz, Miller, Barber, Miller, Sullivan et al., 2013; Naganathan & Mueller, 2019).

Identifying factors affecting the likelihood that ED providers screen and counsel suicidal patients about firearm access can inform training or protocol development. Some have hypothesized that ED providers who own or are more comfortable with firearms might have different counseling beliefs and behaviors (Becher, Cassel & Nelson, 2000; Wolf, Delao, Perhats, Clark, Moon et al., 2019). This study aimed to examine that hypothesis and build on prior work by (1) comparing non-behavioral health ED clinicians (physicians and advance practice providers, referred to here as "ED providers") to behavioral health (BH) providers working in the ED, and by (2) including information about providers' own access to firearms. Specifically, we sought to describe providers' attitudes and behaviors towards lethal means counseling (LMC) with a focus on firearm-specific LMC. We investigated potential relationships between these attitudes or behaviors with (1) provider type (ED versus BH) and (2) whether the provider had firearms at their own home.

METHODS

Study design and setting

An anonymous, web-based survey was administered at four large EDs in Colorado: a tertiary care academic center, an urban safety net hospital, and a regional medical center with two EDs in a geographic region with high firearm ownership rates. All EDs had 24/7 coverage by behavioral health specialists. Eligible participants were ED physicians, ED advance practice providers (i.e., physician assistants or nurse practitioners), and ED-based behavioral health evaluators (e.g., social workers, psychologists, psychiatrists, advanced practice BH nurses) working in any of the participating hospitals. Providers were invited via emails with a link to a survey in REDCap (Research Electronic Data Capture), a secure web application (Harris, Taylor, Thielke, Payne, Gonzalez et al., 2009). Providers who completed the survey had the option to submit their email address to receive a $5 gift card incentive. The study was approved by the Colorado Multiple Instructional Review Board.

Measures

Provider demographics included self-reported gender, age, Veteran status, years working in the ED since finishing training, and approximate number of suicidal patients cared for each month. Participants were asked to self-report what type of provider they were; data was categorized post-hoc as ED providers or BH providers. These distinctions (ED versus BH) were based on the primary clinical role (general ED versus behavioral health care) of the providers at the participating hospitals. The presence of home firearms was obtained from the question, "Who mostly controls the storage of any firearms kept in your home?" with the responses "Mostly controlled by me" and "Mostly controlled by partner/spouse" identifying providers with firearms at home (versus "No firearms in my home").

Participants were asked about their beliefs, attitudes, and typical behaviors as related to care of suicidal ED patients and lethal means assessment and counseling (e.g., own confidence in

assessment and counseling, perception of provider responsibility), using questions from prior published surveys (Betz, Miller et al., 2013; Betz, Sullivan et al., 2012). Participants were also asked about provider and perceived patient attitudes related to decision-making for firearm storage, using the Control Preferences Scale (Degner, Sloan & Venkatesh, 1997). Finally, they were asked how often they typically ask patients about firearm access in five different scenarios ("How often do you CURRENTLY ask patients whether there are firearms at home in each of the following situations?") as used in previous published surveys (Betz, Miller et al., 2013). For analysis, Likert scale responses were collapsed into dichotomous variables ("strongly agree"/"agree" *versus* "disagree"/"strongly disagree"; or "almost always"/"often" *versus* "sometimes"/"hardly ever").

Analysis

We summarized the sample and responses with means and standard deviations for continuous variables and with frequencies and percentages for categorical variables. Differences among groups (firearms in home, provider type) were tested with analysis of variance (ANOVA) for continuous variables and with Fisher's exact tests for categorical variables.

Building on prior work, we next sought to examine characteristics associated with the binary outcome of "almost always"/"often" asking about firearms versus "sometimes"/"hardly ever" in all five of the clinical scenarios. Using this behavior question as a primary outcome, we conducted univariate and multivariable logistic regression analyses including covariates of age, gender, years working in the ED, number of suicidal patients seen per month, provider type, presence of firearms at home, belief that one's own provider type should assess for firearms, and belief that "most" or "all" suicides are preventable. The choice of initial covariates was also based on prior work (Betz, Miller et al., 2013). The multivariable logistic regression model included all predictors with a p-value less than 0.1 in the univariate analysis. All p-values were two-tailed with statistical significance assessed at the 5% significance level. Statistical analyses were performed using R version 3.6.1.

RESULTS

Demographics

Invitation emails were sent to 232 providers, and 95 (41%) completed the survey. Among these, 7 did not answer the firearm question and 9 did not report a provider type or responded "other". The final sample for analysis therefore included 79 participants: 48 ED providers and 31 BH providers with a mean combined age of 40.5 years (Table 1). A majority of respondents were female (n=47; 59%) and white (n=73; 92%); while approximately half (n=25; 52%) of ED providers were male, only 23% (n=7) of BH providers were. Overall, 35% (n=28) of responding providers reported having a firearm at home, though firearm ownership/access was more common among ED than BH providers (n=19, 40%; versus n=9, 29%). Overall, ED providers reported more years working in the ED since completing training, but BH providers reported caring for a greater number of suicidal patients per month.

Attitudes Towards Lethal Means Counseling

Most respondents (n=46, 58%) thought that “most (51–90%)” suicides are preventable; only 25% (n=20) thought that <50% were preventable, with no significant differences in beliefs by provider type (P=0.09) or presence of firearms at home (P=0.11). Overall, participants reported feeling confident in their ability to assess a patient’s suicide risk severity (62–97%) or to ask at-risk patients about access to lethal means (93–100%), again without differences by provider type or home firearms. Yet when ED providers were asked if – in the case where they deemed a patient’s suicide risk severity to be low – they felt comfortable discharging the patient without consulting a BH provider, only 38% (n=18) agreed. Furthermore, fewer ED providers (n=17, 35%) than BH providers (n=25, 81%) felt confident in their ability to counsel patients about reducing home access (P<0.001) without differences by firearm ownership. Most (n=40, 83%) ED providers said they would be more likely to consult a BH provider if a suicidal patient reported home access to lethal means, with no difference by whether the provider had firearms at their own home or not.

Providers were evenly split on whether they thought patients preferred to make firearm storage decisions on their own or with clinician input (Figure 1); the only significant difference by provider type across these seven questions was that ED providers were less likely than BH providers to believe that suicidal patients were open to suggestions from clinicians about access/storage (n=26, 54%; versus. n=24, 77%, P=0.016). Most participants thought providers did not know enough about firearms or storage options to help patients make access/storage decisions (n=45, 57%), and few were confident in their ability to support patients making these decisions (n=14, 18%). Most participants did not believe providers received enough training in helping patients make these decisions (n=62, 78%), and most thought it would be helpful to have a clear step-by-step approach to use for supporting patients in firearm access/storage decisions (n=65, 83%); none of these findings varied by provider type or firearm ownership. Among ED providers, those who had firearms at home were less likely than those who did not to think that providers found it difficult to recognize patients who need help making firearm access/storage decisions (n=5, 26%; versus n=18, 62%; P=0.020). There were no other differences by firearm ownership.

When asked who should have the primary responsibility to *ask* about a patient’s access to lethal means, more BH providers than ED providers thought their own provider type should (n=22, 71%; versus n=26, 54%), although the difference was not statistically significant potentially due to the small sample size. However, provider views did differ significantly when asked who should have the primary responsibility to *counsel* about reducing lethal means access; 94% (n=29) of BH providers thought they should versus 15% (n=7) of ED providers (P<0.001). Having a firearm at home was not associated with responses to these questions.

Behaviors Regarding Lethal Means Counseling

Among the five scenarios presented, in two – when a patient was suicidal with a plan, either involving a firearm or not – ED and BH providers were equally likely to report almost always or often asking about firearm access (Figure 2). Asking was most common when the patient was suicidal and had a plan involving a firearm: in this scenario, 92% (n=49) of ED

providers and 100% (n=31) of BH providers said they almost always or often ask about firearm access. In the three scenarios not involving suicide plans (“suicidal in past month, but not now”; “suicidal today, without plan”; “In ED for overdose, no longer suicidal”), ED providers were significantly less likely than BH providers to routinely assess firearm access (Figure 2). For example, only 50% (n=24) of ED providers reported almost always or often asking about access to firearms (compared to 87% [n=27] of BH providers) when the patient reported feeling suicidal in the last month (P=0.001; Figure 2).

There were 43 (54%) providers who reported almost always or often asking about firearm access in all five of the patient scenarios. In the multivariable model (Table 2), BH providers were over five times more likely than ED providers to ask about access to firearms in all scenarios (OR: 5.58, 95% CI 1.68–18.6) after adjusting for years of training, number of suicidal patients seen per month, and belief that one’s own provider type should assess firearm access. Race was omitted from the analyses as no non-white participants noted their race. A multivariable model including an interaction between provider type and having firearms in the home was also considered but did not converge.

DISCUSSION

To our knowledge, this study is the first to examine whether home firearm access influences providers’ attitudes, beliefs, and behaviors about lethal means counseling of suicidal patients in EDs, and the first to compare ED and BH provider views across three sites. Contrary to our hypothesis, behaviors and attitudes about LMC largely did not vary by whether the provider had firearms at home. Consistent with prior work, only half of ED providers reported asking suicidal patients about access to firearms. Behavioral health providers were more likely than ED providers to provide LMC. Almost all providers thought that additional training and protocols about how to help patients make firearm storage decisions would be helpful.

A novel result of this study was our finding that providers’ personal experience with firearms – measured here by the proxy of having a firearm in one’s own home – minimally correlated with provider beliefs or behaviors about LMC for patients with suicide risk. In prior work, psychiatrists who were familiar with firearm safety were more likely to provide LMC to patients (Price, Kinnison, Dake, Thompson & Price, 2007), but this issue had not previously been explored in ED settings, where suicidal patients are seen at the highest point of crisis. Others have speculated that making providers more comfortable with firearm culture, including bridging the “culture gap” between firearm-owning patients and non-owning providers (Marino, Wolsko, Keys & Pennavaria, 2016), might enhance counseling. Interestingly, in this survey there were no differences in provider behaviors and attitudes towards LMC by firearm ownership other than the belief that most providers find it difficult to recognize patients who need help making firearm access/storage decisions. This could indicate that ED providers who have firearms at home have a better understanding of patients who are fellow firearm owners, including recognizing when a patient needs help making such decisions. The lack of other differences by firearm ownership might reflect the clinical setting, in that providers in EDs may have more exposure to firearm injuries and ownership than providers in other settings. Further work is merited, but it is encouraging that

having a firearm at home does not appear associated with providers' practices related to LMC; providers may not need to be especially comfortable with firearm culture in order to feel confident about talking to patients about firearms. At the same time, our findings should not discourage engagement of firearm-owning providers as critical partners for development and delivery of firearm safety messaging. These providers might help inform their non-firearm-owning peers about firearm culture and the best way to engage with patients in a "culturally competent" manner (Betz & Wintemute, 2015), and their insights could aid in development of materials and interventions (Bulger, Kuhls, Campbell, Bonne, Cunningham et al., 2019).

Previous studies have shown that if providers have more confidence in their ability to screen for suicide, they are more likely to do so (Betz, Miller et al., 2013). While almost all ED providers in our study felt confident in their ability to ask patients about access to firearms, not all of them asked suicidal patients about access to firearms and thus confidence did not correlate with self-reported behaviors. This difference may be because a higher proportion of ED providers felt confident in their ability to assess suicide risk severity and a higher proportion reported asking suicidal patients about firearm access compared to prior work (Betz, Barber et al., 2010; Betz, Kautzman, Segal, Miller, Camargo et al., 2018; Betz, Miller et al., 2013; Naganathan & Mueller, 2019). This increase in confidence and behavior may reflect recent increased popular media and medical attention to firearm injury risk factors (Pallin, Spitzer, Ranney, Betz & Wintemute, 2019; Ranney, Betz & Dark, 2019; Wintemute, Betz & Ranney, 2016).

Suicide prevention and medical organizations and the Joint Commission are moving LMC towards being a standard of care in the ED for all patients identified as having suicide risk (Joint Commission, 2015). An understanding of ED patient care flow – including which clinician's role it is to provide LMC – is critical for optimal implementation of LMC. We found that less than 15% of ED providers believed that their own provider type should be responsible for providing this counseling to patients; this finding corresponds with previous studies that found that most physicians believe that it is the responsibility of the psychiatrist to counsel patients about reducing access to firearms during a suicidal crisis (Betz, Miller et al., 2013). While consultation with a BH professional is a recommended part of ED care for suicidal patients, lack of clarity of roles could contribute to patients not receiving LMC. Clearly delineated responsibilities between BH and medical providers could be helpful at sites with BH provider coverage (Runyan, Brooks-Russell, Tung, Brandspigel, Betz et al., 2018). It is important to remember, however, that in-person BH professional evaluation is not always feasible, especially in smaller or rural EDs (Baraff, Janowicz & Asarnow, 2006; Capoccia & Labre, 2015). The advent of telepsychiatry for virtual consultation may help, but additional ED provider training and resources – especially for smaller or rural EDs – may be warranted.

Similar to prior work, we found that the majority of providers felt that they had low knowledge, low confidence, and low training in firearm-specific lethal means counseling. The only difference between BH and ED providers was that the former were more likely to believe that patients would be accepting of counseling – possibly reflecting their own experiences. Our findings highlight a need for training and continuing education for

providers about firearm storage and lethal means access; currently available resources include CALM training for suicide prevention (SPRC, 2009) and general training related to firearm safety (including suicide prevention) (Bulger, Kuhls, Campbell, Bonne, Cunningham et al., 2019; Pallin, Spitzer et al., 2019). Further examination of the effects of training, and the best methods for dissemination, is urgently needed.

LIMITATIONS

Limitations include participation bias and social desirability bias, both of which may result in over- or under-reporting of extreme beliefs. Additionally, the survey used self-report questions; as the survey was anonymous, we were unable to correlate with actual behaviors. The survey asked providers how many “suicidal patients” they cared for per month without asking for clarification of the quality or intensity of those thoughts; providers may have interpreted this question differently, which raises the possibility that the model underestimated any actual impact on provider views or behavior. Although the survey covered four EDs in geographically and culturally diverse regions, we do not know the extent to which responding providers were similar to the general population of providers in the region, and our findings may not generalize to other states or regions. We used only firearm ownership as a proxy for providers’ familiarity with firearms, but other variables for future study might include firearm training, frequency of firearm handling, or comfort with firearms. Similarly, all participating EDs had on-site BH providers; the views and practices at smaller or more rural EDs may be different. Finally, the sample size was too small to allow for detailed subgroup analyses and limited power. All of these issues may have affected the overall model in variable directions; for example, it may be that, among particular populations of providers who are comfortable with firearms (as owners or frequent handlers for hunting or recreation), there may be a positive association with frequency of counseling.

CONCLUSION

In conclusion, our four-ED study demonstrates that although most ED and ED-based BH providers are comfortable with screening for lethal means access among suicidal patients, fewer are comfortable with counseling. These findings were not moderated by providers’ own home firearm access. Findings related to clinical roles and BH provider consultation reflect larger issues concerning ED-based mental health care, given that increased suicide screening is identifying more at-risk patients (Horowitz, Boudreaux, Schoenbaum, Pao & Bridge, 2018), that BH resources are limited, and that ED providers may not have adequate training or resources to deliver optimal care by themselves. Augmentation of training and resources – including through telepsychiatry – will be critical for widespread implementation and dissemination of lethal means counseling for suicidal patients. Further exploration of the separate, yet intersecting, roles of ED and BH providers will also be important, as well as more nuanced exploration of how experience with firearms may, or may not, affect beliefs and behaviors. All providers in the study, regardless of whether they had firearms at home, identified a lack of confidence and knowledge about helping patients make firearm storage decisions, highlighting a future area of education, training, and protocol development.

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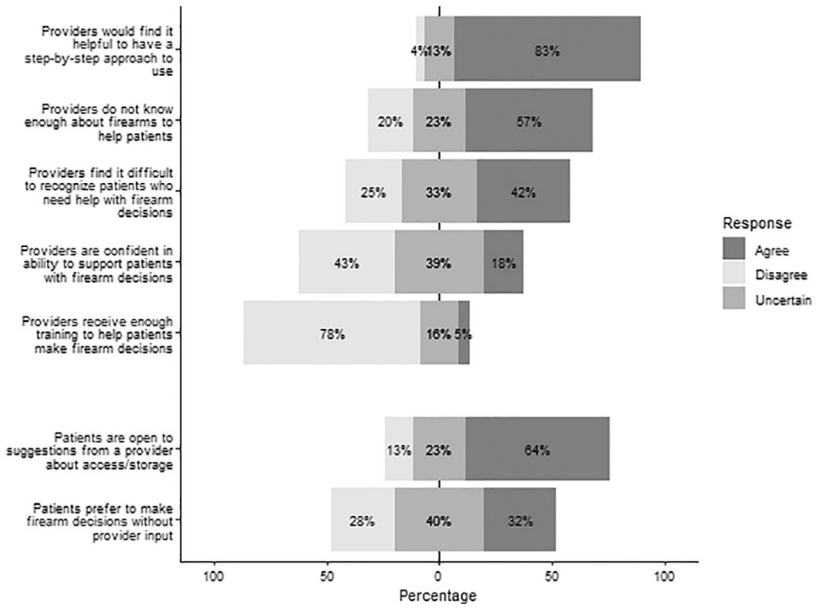

Figure 1: Views on provider and patient engagement in decision-making about firearm storage in times of suicide risk (n=79).

Views on provider and patient engagement in decision-making about firearm storage in times of suicide risk (n=79).

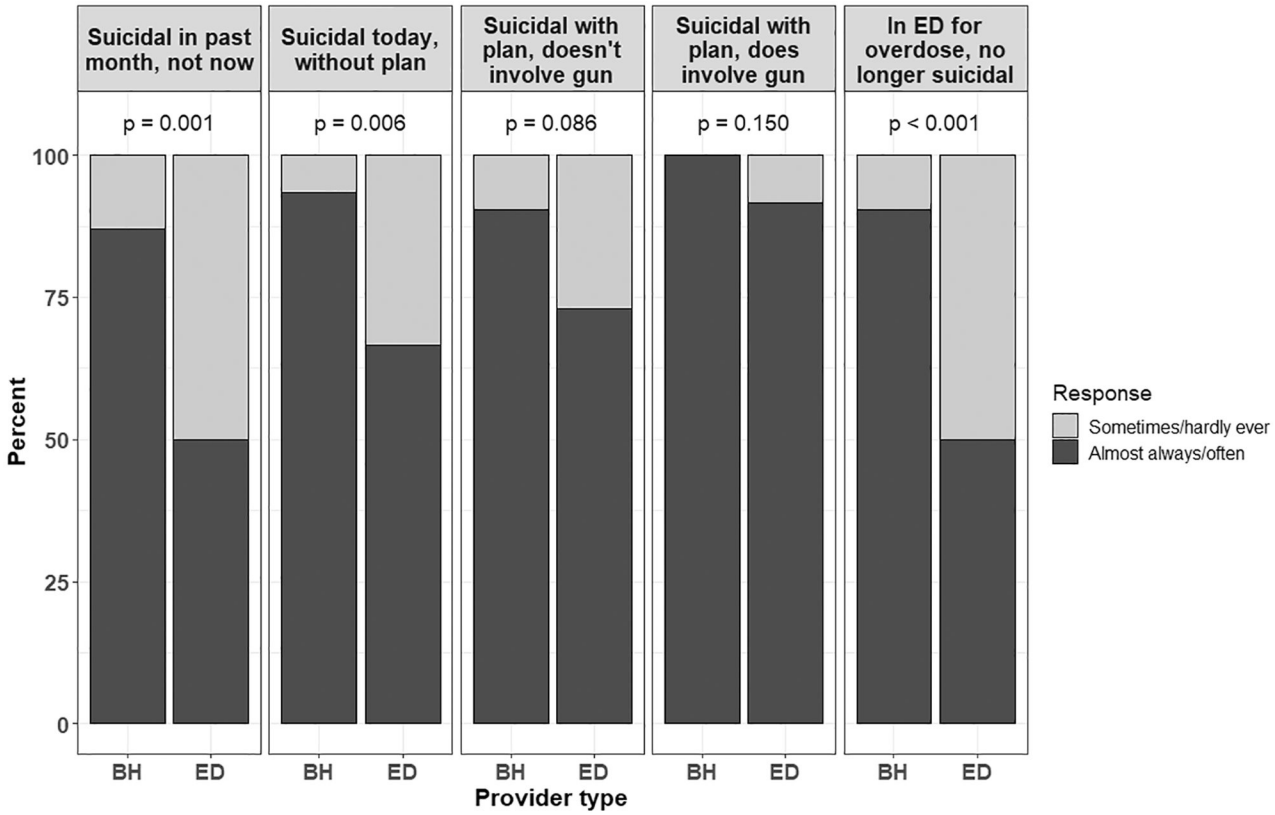

Figure 2: Self-reported frequency of assessing firearm access in five patient scenarios, by provider type (n=79)

Self-reported frequency of assessing firearm access in five patient scenarios, by provider type (n=79)

P values from Fisher's exact tests.

Table 1.

Participant characteristics, by provider type and firearms at home (n=79).

	ED provider		BH provider		*P values*	
	No firearm (N = 29) n (%)	**1+ firearm (N = 19) n (%)**	**No firearm (N = 22) n (%)**	**1+ firearm (N = 9) n (%)**	***Firearms***	***Provider type***
Gender					0.033	0.011
Male	12 (41.4)	13 (68.4)	4 (18.2)	3 (33.3)		
Female	17 (58.6)	6 (31.6)	18 (81.8)	6 (66.7)		
Age in years (mean, SD)	38.8 (7.2)	42.6 (8.2)	39.5 (10.3)	44.9 (8.6)	0.050	0.785
White Race	26 (89.7)	18 (94.7)	21 (95.5)	8 (88.9)	1.0	1.0
Veteran	2 (6.9)	3 (15.8)	1 (4.5)	1 (11.1)	0.237	0.698
Who mostly controls the storage of any firearms kept in your home?					--	0.644
No firearms in my home	29 (100)	0 (0)	22 (100)	0 (0)		
Mostly controlled by me	0 (0)	14 (73.7)	0 (0)	6 (66.7)		
Mostly controlled by partner/ spouse	0 (0)	5 (26.3)	0 (0)	3 (33.3)		
Has administrative role in ED					0.007	0.141
Yes	4 (13.8)	8 (42.1)	1 (4.5)	2 (22.2)		
No	25 (86.2)	11 (57.9)	21 (95.5)	7 (77.8)		
Years working in ED post-training (mean, SD)	9.5 (6.9)	10.2 (7.2)	4.8 (4.9)	4.9 (5.5)	<0.001	<0.001
Number of suicidal patients cared for a month (mean, SD)	18.1 (12)	30.8 (41.3)	66.5 (93.2)	61.8 (93.9)	0.019	0.019

P values from Fisher's tests for categorical demographic variables or ANOVAs for continuous demographic variables

Table 2.

Univariate and multivariable logistic regression analyses of characteristics associated with reporting almost always or often asking about firearm access in all five patient scenarios

Characteristic	Almost always/ often ask in all scenarios (N = 43) n (%)	Unadjusted odds ratio (95% CI)	Multivariable odds ratio (95% CI)
Age (years)	-	1.03 (0.98, 1.09)	
Years working in ED post-training	-	0.94 (0.88, 1.01)	0.97 (0.89, 1.05)
Number of suicidal patients seen per month	-	1.03 (0.9997, 1.06)	1.02 (0.995, 1.05)
Gender			
Male	17 (39)	1.0 (Ref)	
Female	28 (64)	1.42 (0.57, 3.52)	
Provider type			
ED provider	19 (43)	1.0 (Ref)	1.0 (Ref)
Behavioral health provider	26 (59)	8.33 (2.71, 25.64)***	5.58 (1.68, 18.6)**
Number firearms in home			
0	27 (61)	1.0 (Ref)	
1+	18 (41)	1.43 (0.56, 3.65)	
Belief that my provider type should assess for firearms			
No	14 (32)	1.0 (Ref)	1.0 (Ref)
Yes	31 (70)	2.44 (0.97, 6.19)	2.34 (0.81, 6.78)
Belief that suicides are preventable			
Almost none/few/some are preventable	11 (25)	1.0 (Ref)	
Most/all are preventable	34 (77)	1.32 (0.48, 3.66)	

P values:

* < 0.05,

** < 0.01,

*** < 0.001

Variables selected for adjusted model had *P* values of <0.10 in unadjusted models