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Gun Retailers' Willingness to Provide Gun Storage for Suicide **Prevention**

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Abstract

Objectives: We examined factors grounded in the theory of planned behavior that influence gun retailers' willingness to provide temporary, voluntary firearm storage for suicide prevention.

Methods: We conducted a cross-sectional survey of gun retailers in the US mountain west. Analyses included descriptive statistics and ordered logistic regression.

Results: Ninety-five gun retailers responded to the survey (25% response rate) and 67.6% (95% CI: 59.6, 75.6) stated that they would be very or somewhat likely to provide temporary gun storage. Firearm retailers who agreed with the statements: "Our store can be an important part of the effort to improve gun safety in my community" (OR: 1.86, 95% CI: 1.1, 3.14) and that offering storage provided "The chance to be seen as a positive member of the community" (OR: 1.49, 95% CI: 1.00, 2.22) were more likely to state that they would be willing to provide storage.

Conclusions: Firearm retailers are potentially important storage partners for means safety and suicide prevention efforts. Additional research and practice innovations are needed to assess gun retailers' willingness to provide gun storage and partner on suicide prevention efforts in other geographic regions.

Keywords

depression; firearms; means safety; prevention; suicide

Suicide is the 10th leading cause of death for all ages in United States (US) and in 2016 there were 44,965 deaths due to suicide. Approximately 50% of all deaths from suicide in the US involve a firearm and approximately 60% of all firearm deaths are suicides. Means safety, where lethal means such as guns and medications are made inaccessible to suicidal individuals, is one of the most promising interventions to decrease the likelihood of death by suicide. 3–6

Numerous studies and examples show that when lethal means are less available or made less lethal, suicide rates decline.^{7–10} The impact of means safety on suicide deaths is influenced by the lethality of the specific means in question. The more lethal the means, the greater the potential impact of means safety on deaths by suicide.³ Therefore, means safety related to firearms is especially important, as firearms are the most lethal method of suicide attempts, with a 91% case fatality rate.¹¹ Because of this lethality, the simple presence of a firearm in the home is associated with a greater than 3 times increased risk of suicide.¹²

One option for means safety is the safe storage of firearms outside of the home. However, practical storage options are needed to realize the potential that reducing access to lethal means holds to decrease firearm-related suicide deaths. ¹³ Although there is widespread recognition of the problem of firearm-related deaths from suicide and the potential for means safety to decrease the number of deaths, where best to store firearms when an individual is in crisis is a topic that needs additional attention and research. For example, temporarily storing firearms with friends or family may not be practical or safe within that household, and depending on state laws there could be legal barriers to private transfers. ¹⁴

Gun retailers could play an important role in suicide prevention by providing temporary and voluntary storage of firearms in cases of elevated suicide risk. Local public health groups across the US already have engaged gun shops in educating gun owners about the principles of means safety for suicide prevention, along with other aspects of suicide prevention, ¹⁵ but with less attention to encouraging gun retailers to store firearms. Yet, gun retailers and ranges may be preferable as storage partners compared to law enforcement agencies or other institutions with the capacity to store firearms, as they are already trusted members of the firearm community.

Of course, for gun retailers to serve as means safety partners, they need to be willing to store firearms for the purposes of suicide prevention. In related work, we found that 47.6% (95% CI = 39.2, 56.0) of gun retailers in 8 Mountain West states are already providing storage and are amenable to considering storage under different circumstances. We need a better understanding of gun retailers' willingness to store firearms for the purposes of suicide prevention and which factors influence their decisions to engage them as storage partners for means safety.

The theory of planned behavior (TPB) provides a framework to examine gun retailers' willingness to provide storage for suicide prevention. The TPB was developed as a model for understanding human behavior and the factors that influence behavioral decisions. ¹⁷ In the theory, the combination of attitude toward the behavior, subjective norm, and perceived behavioral control form a behavior intention, which in turn is the primary driver of actual behavior. ¹⁸ Whereas the theory of planned behavior was developed primarily to explore personal human behavior, it also has been used extensively to examine human behavior in professional contexts. ¹⁹

Here we draw on the theory of planned behavior to explore factors that influence the decisions by gun retailers to offer storage. The purpose of this work is to help identify approaches to encourage gun retailers to offer storage for suicide prevention. We developed a cross-sectional survey that examined the associations between gun retailers' stated willingness to provide voluntary and temporary storage in a situation when there is a personal crisis and self-reported factors that fit within the domains from the theory: attitude, subjective norms, and perceived behavioral control. We hypothesized that constructs from the TPB would be associated with gun retailers' stated willingness to provide firearm storage for the purposes of means safety. As indicated by the theory, behavioral intentions are a strong predictor of future behavior. ¹⁷

METHODS

Study Design

To develop our survey instrument we first conducted qualitative interviews with 8 gun retailers to explore their current storage practices and identify the types of attitudes and beliefs associated with providing gun storage for means safety and suicide prevention more broadly. The results allowed us to identify key issues, framing, and language for our initial survey questions. We then pilot tested the survey instrument with 3 gun retailers in contiguous states outside our sample region and refined and finalized the instrument (available upon request from authors).

As detailed in Runyan et al,¹⁶ we attempted to contact managers and/or owners at all gun retailers, identified through Dunn and Bradstreet's DUNS Market Identifier Database, in the US Mountain West region (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming). We refined the initial purchased sample of 1381 retailers by first eliminating 180 misclassified businesses (eg, a beauty supply chain, tractor company, etc). We then called the remaining 1201 retailers to confirm that they sold guns from a storefront, eliminating an additional 600 retailers. This left us with a final sample of 601 gun retailers.

We conducted the survey between March and July 2016. First, we sent cover letters, a paper survey, and a \$2 bill as an incentive to all eligible retailers with the option of responding via mail or online. We sent second and third mailings to non-responders with an additional \$2 bill incentive in the third mailing. We then took our cross-sectional survey results and modeled the association between gun retailers' stated likelihood of providing storage and a variety of potentially predictive factors from the domains from the TPB.

Dependent Variable

In this analysis, our primary outcome of interest was gun retailers' stated behavioral intentions of being: (1) very likely, (2) somewhat likely, (3) somewhat unlikely, or (4) very unlikely to provide temporary and voluntary storage when presented with the situation: "A gun owner wants his or her guns stored away from their home while going through a personal crisis." We also asked about retailers' experiences in providing voluntary and temporary storage of firearms for the purposes of suicide prevention.

We also asked about the retailers' likelihood of offering temporary storage when: (1) "A gun owner is concerned about the mental stability of an adult family member and wants the guns stored outside of the home" and (2) "A gun owner is a parent concerned about the mental stability of a teenager in the home." The responses to the various scenarios that we considered were highly correlated with Pearson's rs greater than 0.90. We conducted sensitivity analysis that included modeling these alternative scenarios and the results were similar. For clarity, we only report model results for the personal crisis situation: "A gun owner wants his or her guns stored away from their home while going through a personal crisis."

Independent Variables

To define the independent variables for our final model we employed a 3-step process. First, we took all of the items from our survey that were aligned with the key domains from the theory of planned behavior of: (1) attitudes, (2) subjective norms, and (3) perceived behavior control. This resulted in multiple items for each domain. We then examined potential collinearity among variables within a domain and eliminated variables that were collinear based on model variance inflation factors and Pearson's r correlation statistics. When variables were collinear we kept the variable with the best model fit based on Wald statistics. Finally, we eliminated variables in the model that did not contribute significantly to overall model fit, again based on Wald statistics.

Attitude.—In the TPB, behavioral intention is, in part, a function of attitude toward the behavior. The domain of attitude in the theory also includes beliefs about the ability to address the issue and the perceived outcomes of the behavior. Three items in our survey were intended to measure attitude. These items were gun retailers' agreement with the following statements: (1) "If someone is suicidal they will find a way to end their life no matter what anyone tells them," (2) "Suicide is an important problem in my community," and (3) "Our store can be an important part of the effort to improve gun safety in my community." For each of these items, gun retailers chose one of the following responses: strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

Our final model included only the third item: "Our store can be an important part of the effort to improve gun safety in my community." These 3 items were not collinear with one another; however, the first and second items did not contribute significantly to the model and were eliminated.

Subjective norm.—Subjective norm is a key domain in the theory, representing the influence that social norms and the perceived judgement of peers and significant others have on behavioral intentions. ¹⁷ Two items from our survey assess subjective norm. First, we asked about gun retailers' stated importance (ie, very important, somewhat important, somewhat unimportant, or not at all important) of "Support from members of the community for your store to provide temporary storage." Secondly, we asked gun retailers about perception of the benefits (ie, no benefit at all, minor benefit, moderate benefit, or major benefit) from "The chance to be seen as a positive member of the community" by offering temporary gun storage. Our final model includes both of these items as there were no issues with collinearity and they both independently contributed significantly to the final model.

Perceived behavioral control.—Perceived behavioral control encompasses an individual's perceived ease or difficulty in performing the behavior in question and includes barriers or factors that would potentially prevent an individual from performing the behavior. Six items from our survey were intended to assess the domain of perceived behavioral control. All of these items in the survey were presented as potential barriers to providing temporary gun storage. These items were gun retailers' stated assessment of the following potential barriers, which they rated as "no barrier at all, minor barrier, moderate barrier, or major barrier:" (1) "having enough space to adequately store the guns," (2) "potential legal liability for the business while storing the guns," (3) "the cost to the business of providing storage," (4) "logistics of gun drop-off/pick-up," (5) "potential legal liability for the business when returning the guns," and (6) "concern about being able to tell if it's safe to return the gun." Due to collinearity issues, we only included "potential legal liability for the business while storing the guns," "cost to the business of providing storage," and "concern about being able to tell if it's safe to return the gun" in our final model.

Data Analysis

We used unweighted data for our analysis to maximize the internal validity of our findings. We also ran sensitivity analyses using weighted data and the results were similar. We used ordered logistic regression because the dependent variable is an ordered categorical variable. This modeling approach is only appropriate if the data adhere to the proportional odds assumption which we tested by performing likelihood-ratios tests of the proportionality of odds across ordered response categories. Our main model and all of our sensitively analysis models passed this test. This modeling approach provided us with odds ratios and 95% confidence intervals (95% CI) associated with all of the independent variables of interest that we included in our final model.

RESULTS

A total of 95 gun retailers responded to the survey, 181 businesses declined, and 325 were of unknown eligibility as they had nonworking phone numbers and/or mailed surveys where returned as "undeliverable." Using formulas from the American Association of Public Opinion Research, which account for a mixture of eligible and ineligible business in our pool of unknown eligibility, we calculated a response rate of 25%. ²¹ Due to missing data issues, the final analysis sample included 92 gun retailers. Of these 92 gun retailers, 67.6%

(95% CI: 59.6, 75.6) stated that they would be very or somewhat likely to provide temporary gun storage when "A gun owner wants his or her guns stored away from their home while going through a personal crisis."

In our final model, the one attitude variable (gun retailer stated agreement to the statement: "Our store can be an important part of the effort to improve gun safety in my community") was statistically associated with stated likelihood of providing temporary gun storage with an odds ratio of 1.86 (95% CI: 1.10, 3.14). That is, for every one-step increase in stated agreement there is an 86% increase in the odds that a gun retailer will respond with a one-step increase in stated likelihood to provide temporary gun storage controlling for all other variables (Table 1).

Both of the subjective norm variables in our model had estimated increased odds of providing storage. The first item (gun retailer stated importance of: "Support from members of the community for your store to provide temporary storage") had an odds ratio of 1.43 (95% CI: 0.97, 2.12) but was just short of statistical significance (p = .072). The second item (gun retailer stated benefit from "The chance to be seen as a positive member of the community") had a statistically significant estimated odds ratio of 1.49 (95% CI: 1.00, 2.22; p = .047).

The final 3 dependent variables in our model were in the perceived behavioral control domain and all of them had statistically significant and negative associations with gun retailers' stated likeliness to provide temporary gun storage. Increased perception of "The cost to the business of providing storage" as a barrier was associated with a 42% decrease in the odds (OR: 0.58, 95% CI: 0.39, 0.87) of providing temporary gun storage. Increased perceived "Potential legal liability for the business while storing the guns" was associated with a 37% decrease in the odds (OR: 0.63, 95% CI: 0.40, 0.98) of providing temporary gun storage. Finally, when gun retailers reported increased "Concern about being able to tell if it's safe to return the gun" there was a 40% decrease in the odds (OR: 0.60, 95% CI: 0.37, 0.97) of a gun retailer reporting likelihood to temporarily store guns.

DISCUSSION

There has been a rapid growth in discussion, research, and program development related to reducing firearm access during times of suicide risk. Counseling by healthcare providers in hospital emergency departments and other key settings is recommended and national efforts by private and public organizations, including the Veterans Administration, the Department of Defense, and foundations, are helping propel this work.^{22–24} Firearm retailers could be important partners in these efforts.

There is a growing grassroots effort among public health practitioners to engage directly with firearm retailers as partners for suicide prevention. For example, work first conducted by the New Hampshire Firearm Safety Coalition has highlighted that public health organizations can collaborate with retailers on suicide prevention activities. ¹⁵ This group developed the "Gun Shop Project" to work with retailers and develop materials related to training personnel to avoid sales to suicidal customers and to educate customers on suicide

prevention and firearm safety.¹⁵ This pioneering work is being replicated across the country in more than 20 other states and in a national partnership between the Shooting Sports Foundation and the American Foundation for Suicide Prevention.^{3,25} During this period of creative progress and expansion, there has been less attention to how theory can inform dissemination of best practices.

Our study adds to this literature in suggesting that gun retailers' stated likelihood of providing temporary and voluntary gun storage for individuals in crisis is associated with their beliefs toward improving gun safety in the community and being viewed positively by the community, domains consistent with the TPB. These findings suggest that gun retailers may be under-utilized partners for means safety. 'Gun Shop Projects' around the country could add this component of exploring storage options to their coalition efforts.

A report by the Consortium for Risk-Based Firearm Policy recommends that all trainees in medicine, mental health, nursing, and other clinical health fields should be trained in means safety counseling and argues that it should be delivered in primary care, emergency and urgent care, and behavioral health settings to any individual at elevated risk for suicide. The report also highlights the need to provide viable safe storage options and notes that storage options with "firearm organizations might be particularly appealing to firearm owners." 26

Healthcare professionals in hospital emergency departments are critical providers of means safety counseling to individuals in crisis. Yet, clinicians may be unaware of the potential for gun retailers to serve as a storage partner for firearms when someone is at risk for suicide. We previously found that whereas 68.9% (95% CI: 62.9, 74.8) of the respondents from emergency departments in the Mountain West stated that they provided safety counseling when patients disclosed they had firearms in the home, 75.5% reported rarely or never recommending "asking a local firearm retailer to temporarily store firearms."

Our findings suggest that increasing the receptivity of gun retailers to partner on suicide prevention efforts and provide temporary and voluntary storage for suicide prevention may require attention to the attitudes and beliefs described here, including a focus on providing a valued service to the community and addressing the legal liability issues and safe return of firearms as barriers to action.

Many firearm retailers may not be aware of the high proportion of firearm deaths that are due to suicide – but understanding the risk among their customers and community might increase engagement.²⁵ In another analysis from the same survey we found that gun retailers were particularly influenced by local law enforcement, the National Rifle Association, and the National Shooting Sports Foundation.²⁸ Consequently, the role of gun retailers' perceived social norms around participating in suicide prevention efforts like offering storage could be amplified if these prominent firearm groups demonstrate support for retailers' engagement with safe storage. The National Shooting Sports Foundation is currently partnering with the American Foundation for Suicide Prevention but the National Rifle Association has not, as of yet, been visible in these efforts; there is hope it will

increase its activity in coming years, including through discussion of suicide risk during its training courses.

Addressing perceived barriers from gun retailers related to providing storage for means safety counseling also can play an important role in partnering with gun retailers.²⁹
Additional work is needed to examine if gun retailers' perceived barriers, such as legal issues in providing storage, are in fact actual barriers or incorrectly perceived by some gun retailers to be impediments. There is great variation in state laws that govern gun transfers. For example, some states require a background check every time a gun is transferred. Prior work has summarized this variation and provided specific recommendations for changes to state statutes to reduce confusion with transfer policies that may facilitate suicide prevention.¹⁴ For confirmed barriers, efforts to navigate or address them will be key; for example, liability concerns about temporary storage and return of firearms might require policy or regulatory changes or specific directives from national organizations. Public health practitioners may be able to identify workable financial and legal models that could be promoted to gun retailers.

Limitations

Our study was geographically limited to the Mountain West region and the response rate was low, resulting in a relatively small study population. This has implications for the generalizability of our findings. Also, there is the chance that social desirability bias influenced the responses of our study participants and because our study was cross-sectional we only can say that the statistical relationships we see are associations and not necessarily causal. Despite these limitations, to our knowledge, this is one of the first examinations of the attitudes and beliefs associated with gun retailers' willingness to provide voluntary and temporary storage in the context of suicide risk.

Conclusion

Preventing access to firearms during a time of crisis is critical for suicide prevention; yet, there are few options for voluntary and temporary safe storage of firearms outside the home. Gun retailers may be a promising option given their experience with firearms and relationships with the gun owning community. Our findings from a survey of gun retailers in the Mountain West identified several factors associated with willingness to store guns for individuals in crisis. Additional research and practice innovations are needed to confirm which factors are, in fact, influential to design educational and other interventions to enhance partnerships with gun retailers, and to assess gun retailers' willingness to provide gun storage and partner on suicide prevention efforts in other geographic regions.

Human Subjects Statement

This project was approved by Colorado Multiple Institutional Review Board (#14–1644) and the Veterans Administration Research and Development Committee and Subcommittee on Research Safety.

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Table 1

Ordered Logistic Regression of Factors Related to Gun Retailers' StatedLikelihood of Providing Storage

	Odds Ratio	95% CI	p value
Attitude			
Improve gun safety in my community	1.86^*	1.10 - 3.14	.021
Subjective Norm			
Support from members of the community	1.43	0.97 - 2.12	.072
Positive member of the community	1.49 *	1.00 - 2.22	.047
Perceived Behavioral Control/Barriers			
Cost to the business	0.58*	0.39 - 0.87	800.
Legal liability while storing	0.63*	0.40 - 0.98	.041
Able to tell if it's safe to return the gun	0.60*	0.37 - 0.97	.038

* = p < .05