

Association of firearm exposure during youth with lifetime incidence of suicide ideation and suicide attempts

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Abstract

Background: Preliminary evidence suggests firearm availability may increase the risk for suicide ideation and attempts, two common precursors to suicide death. Little is known about which aspects of firearm availability may account for this association. The primary purpose of this study was to examine associations among multiple dimensions of firearm availability with lifetime history of suicide ideation and attempts.

Methods: A cross-sectional, anonymous survey was administered to 6200 U.S. adults from March 5, 2020, to March 17, 2020. Participants were asked to report firearm availability, firearm use, and suicidal thoughts and behaviors over the lifespan.

Results: Rates of lifetime suicide ideation were significantly elevated among participants reporting a firearm in their childhood home (odds ratio [OR]=1.3, 95% confidence interval [CI]=1.1-1.5). Rates of lifetime suicide attempt were significantly elevated among participants reporting a firearm in their childhood home (OR=1.8, 95% CI=1.5-2.2) and participants who first acquired a firearm before the age of 11 (OR=3.8, 95% CI=2.6-5.8). Among participant with a lifetime history of suicide ideation, rates of lifetime suicide attempt were significantly elevated among participants who first acquired a firearm before the age of 11 (OR=3.0, 95% CI=1.4-6.4), but this relationship was no longer significant when adjusting for demographics and negative affectivity (OR=2.4, 95% CI=0.96-6.0).

Conclusions: Adults who were raised in a home with a firearm and/or first acquired a firearm were significantly more likely to have attempted suicide during their lives. Additional research examining the mechanisms by which early life firearm exposure might increase suicide risk across the lifespan is warranted.

Introduction

Firearms account for more than half of U.S. suicides.¹ Multiple lines of evidence utilizing a range of research methods including cross-sectional and longitudinal designs, as well as state-level and individual-level data, support a positive correlation between firearm availability and suicide. Households with firearms, for instance, have significantly higher rates of suicide than households with no firearms.^{2,3} When firearms availability is reduced via safe storage methods (e.g., use of locking devices), however, suicide risk is reduced.⁴ Research also shows that states with firearm laws that regulate access to firearms have lower suicide rates than states with less restrictive laws.^{5,6} Policy and legislative changes that restrict or reduce firearm availability have also led to declines in suicide rates.⁷⁻¹⁰

Although firearm availability increases the risk of suicide mortality across all age groups, evidence suggests that younger age groups (i.e., children and young adults) may be disproportionately impacted.^{3,11,12} In the U.S., an estimated 18-24% of adolescents report having access to firearms in their homes¹³ and 10-24% report owning their own firearm.^{14,15} Firearm ownership is more common among

male and white adolescents, and increases with age among boys,¹⁴ mirroring trends in suicide mortality among children, adolescents, and young adults.¹ The correlation of firearm availability with suicide among children, adolescents, and young adults may be due to higher levels of impulsivity during these developmental stages.¹¹ From this perspective, firearm availability contributes to suicide mortality by increasing the probability that a suicide attempt will be fatal.

An alternative possibility is that firearm availability contributes to suicide mortality by increasing an individual's propensity to engage in suicidal behaviors, often referred to as *suicidal capability* in contemporary theories of suicide like the interpersonal psychological theory, the three-step theory, and the integrated motivational volitional theory.¹⁶⁻¹⁸ According to these theories, suicidal capability can be acquired through habituation to painful and provocative experiences that are associated with pain, injury, fear, and death. From this biobehavioral perspective, firearm availability—notably firearm access and firearm use—increases the risk of suicide mortality in part through its influence on suicidal capability.¹⁹ Supporting this perspective is research finding a positive association between firearm availability and nonfatal suicidal behaviors. Adolescents who report carrying a weapon while on school property, for instance, are significantly more likely to have made a nonfatal suicide attempt.²⁰ Evidence also suggests that although adults who have previously attempted suicide are less likely to live in a household with a firearm,²¹ adults who live a household with a firearm are more likely to have made a suicide attempt within the preceding year.²² Importantly, these studies have not found a correlation of firearm availability with suicide ideation, however, a pattern that aligns with the conceptualization of suicidal capability as a volitional factor that primarily influences decision-making processes (e.g., to act or not to act).¹⁶⁻¹⁸ Consistent with this distinction, research with suicidal military personnel suggests that increased firearm availability (i.e., having access to loaded and unsecured firearms in one's household) is not associated with severity of suicide ideation but is associated with a stronger expectation of acting upon suicidal thoughts.²³

Central to the acquired suicidal capability hypothesis is that vulnerability to engaging in suicidal behaviors accumulates as a result of repeated or prolonged exposure to painful and provocative experiences. Accordingly, firearm acquisition and use earlier in the lifespan should be associated with increased risk for suicidal behaviors, whether fatal or nonfatal, owing to the accumulation of capability over time. The relationship of prolonged or extended periods of firearm availability with *nonfatal* suicidal behaviors is therefore especially relevant to the acquired capability hypothesis because the highly lethal nature of firearms would reasonably be expected to reduce the probability of surviving a suicide attempt. Specifically, if longer periods of firearm availability are positively correlated with risk of nonfatal suicide attempts, that would support the hypothesis of acquired suicidal capability.

Unfortunately, studies investigating the association of firearm availability with suicidal thoughts and behaviors have predominantly focused on testing their associations with current firearm availability (e.g., currently living in a household with a firearm, current firearm ownership). Further research examining the associations among suicidal thoughts and behaviors with multiple aspects of firearm availability over

different timeframes could reveal new perspectives for understanding the correlation of firearms and suicide mortality, and may implicate new intervention targets for suicide prevention. In the present study, we pursued this objective by examining associations among multiple dimensions of firearm availability—presence of a firearm in a childhood home, age when someone first acquired a firearm, age when someone first shot a firearm, and current firearm ownership—with lifetime history of suicide ideation and suicide attempts in a large sample of U.S. adults.

Methods

Participants and Procedures

Participants were recruited by Qualtrics Panels, a market research company that maintains a list of several million U.S. adults who have agreed to complete research surveys. Potential participants were invited to participate using quota sampling methods via email invitation with an embedded hyperlink to an online survey. Quota sampling was selected for because our primary aim was to examine relationships among variables of interest that were expected to vary across demographic subgroups. In contrast to convenience or snowball sampling, quota sampling can ensure sufficient demographic representation. We did not have sufficient resources to use probabilistic sampling methods, however. Subgroup quotas were selected to match the 2010 U.S. Census data as closely as possible based on the following variables: biological sex, age, race and ethnicity, annual household income, and geographic region. Email invitations did not include any information about the purpose or content of the survey, but only included information about the survey's estimated duration (i.e., 15 minutes) and incentive value (e.g., 145 points). Panel members were required to review an informed consent form that described the purpose of the study prior to completing the survey, which took a median of 11.3 minutes to complete. The stated purpose of the survey in the informed consent form was “to understand how perceptions of safety, perceptions about oneself, and life experiences are associated with the use of various methods for self-protection.” Participants who completed the survey were compensated in the amount agreed upon when they signed up for the panel. This study's procedures were reviewed and approved by the Institutional Review Board at the University of Utah.

Measures

Suicidal Thoughts and Behaviors. The Self-Injurious Thoughts and Behaviors Interview-Revised²⁴ was used to assess lifetime history of suicide ideation and attempts. Items used to assess lifetime history of suicide ideation and suicide attempts are listed in Table 1. A positive history of each was indicated by a participant endorsing any of the items within each category.

Firearm Exposure. Four aspects of firearm exposure were measured (see Table 1). The first item assessing current firearm availability was developed by the Centers for Disease Control and Prevention for the Behavioral Risk Factor Surveillance System.²⁵ The second item assessing firearm availability during childhood was developed for this survey by the researchers to mirror the language and structure of

the CDC item. Finally, the third and fourth items assessing the age when participants first shot a firearm and first acquired a firearm were developed for this survey by the researchers with input from firearm owners serving in an advisory capacity. The age groupings used in the third and fourth items were selected to correspond with the following developmental stages: preadolescence (10 years and younger), early adolescence (11-15 years), middle adolescence to young adulthood (16-25 years), and adulthood (26 years and older).

Negative and Positive Affect. The International Positive and Negative Affect Schedule Short Form (I-PANAS-SF)²⁶ was used to assess negative affectivity during the past week. The I-PANAS-SF measures each mood state with items that are rated on a 5-point scale ranging from “very slight or not at all” to “extremely.” Items are summed to obtain a total score, with high scores indicating more intense affect. Because negative affectivity has been shown to influence our firearm acquisition²⁷⁻²⁹ and suicidal thoughts and behaviors,³⁰ we included this variable as a covariate.

Data Analytic Approach

A series of univariate and multivariate logistic regression models were constructed with lifetime history of suicide ideation and lifetime history of suicide attempt entered as separate outcomes. We first entered each of the four firearm exposure variables as independent predictor variables in separate models, then tested multivariate models with all four firearm exposure variables entered simultaneously, thereby enabling us to examine relationships while accounting for all other aspects of firearm exposure. Finally, negative affectivity and sociodemographic variables (i.e., sex, age, White versus non-White race) were added as covariates to further test the robustness of observed findings. A total of 82,647 panel members received an email invitation, of which 10,368 opened the survey and 6200 completed the survey. Survey open rates and completion rates were higher than recent reports using similar recruitment and sampling methods.²⁹ Data were missing from fewer than 0.5% of participants who completed the survey. We used a combination of p-values, effect size magnitude (i.e., odds ratios), and confidence intervals to assess the significance of findings. Specifically, we considered findings with $p < .01$, $OR > 1.5$ (or the inverse, $OR < 0.67$), and a 95% confidence interval that did not include the value 1 to be significant. All analyses were conducted using SPSS version 25 software with two-tailed tests. Our sample size ($N=6200$) was established based on the results of a priori power analyses with the following assumptions: a minimum effect size threshold of $OR=1.5$, a binary outcome (i.e., lifetime history of suicide attempt) that we estimated would be reported by 5% of the sample, a binary independent variable with a minimum incidence rate of 25%, a minimum of 90% power, and a two-tailed $\alpha=.05$.

Results

The demographic profile of the sample is summarized in Table 2. The lifetime prevalence of suicide ideation and suicide attempts were 14.1% and 7.2%, respectively. Rates of lifetime suicide ideation and suicide attempt by demographic category are also summarized in Table 2. The mean negative affect score was 10.1 ($SD=4.7$) and was comparable to previously published scores among U.S. adults.²⁶ 2311

(37.3%) participants reported currently having a firearm in or around their home, and 2372 (38.3%) reported there being a firearm in their childhood home.

Intercorrelations of firearm exposure variables

To assess the extent to which our four firearm exposure variables were interrelated, all of which were categorical in nature, we used chi-square analyses and calculated Cramer's V statistics. Results are summarized in Table 3. Overall, V statistics indicated firearm exposure variables were moderately and significantly intercorrelated, suggesting they were related but distinct aspects of firearm exposure.

Association of childhood firearm exposure with lifetime suicidal thoughts and behaviors

Results of univariate and multivariate logistic regression models are reported in Table 4. Rates of lifetime suicide ideation were significantly higher among participants who grew up with a firearm in their childhood home. Rates of lifetime suicide attempts were significantly higher among participants who grew up with a firearm in their childhood home, first shot a firearm during adulthood, and first acquired a firearm before the age of 11.

Among participants with a lifetime history of suicide ideation, rates of lifetime suicide attempts were also higher among participants reporting a firearm in their childhood home and participants who first shot a firearm before the age of 11, but this relationship only trended towards statistical significance in our second multivariate model that adjusted for sociodemographics and negative affectivity. We alternately removed negative affectivity and the sociodemographic variables from the model, and found that acquiring a firearm before the age of 11 remained a statistically significant correlate of lifetime suicide attempts when negative affectivity was removed from the model (adjusted odds ratio [aOR]=2.72, 95% confidence interval [CI]=1.10-6.74) but not when sociodemographic variables were removed (aOR=2.23, 95% CI=0.91-5.44), suggesting the association of early childhood firearm exposure with suicide attempts among those who have thought about suicide may have been explained by heightened negative affectivity.

Discussion

Firearm availability is positively correlated with suicide mortality due in part to its highly profile, which increases the probability that suicide attempts will be fatal. The present findings suggest that firearm availability may also contribute to suicide mortality by increasing the probability of acting upon suicidal urges, an effect that has been hypothesized by contemporary theories of suicide.¹⁶⁻¹⁸ According to these theories, repeated and prolonged exposure to stimuli that are associated with pain, injury, and death can increase an individual's capacity for engaging in suicidal behaviors. Previous research has reported positive correlations between current firearm availability and various aspects of suicidal capability—namely suicide attempts^{20,21} and suicidal intent²³—but to our knowledge, this is the first study to examine associations among extended or prolonged firearm exposure and availability across the lifespan with these outcomes.

Consistent with the notion of acquired capability for suicide, participants were significantly more likely to have made a suicide attempt during their lives if they first acquired a firearm during preadolescence (i.e., prior to 11 years of age). Over three-quarters of this subgroup reported growing up with a firearm in the home and first shot a firearm prior to 11 years of age, indicating that early firearm acquisition is strongly correlated with multiple dimensions of firearm availability and exposure. Of note, participants who first acquired a firearm during preadolescence were over three times more likely to have attempted suicide than participants who never acquired a firearm (19.2% vs. 5.8%). When constraining our analyses to those participants with a lifetime history of suicide ideation, acquiring a firearm during preadolescence was a significant correlate of suicide attempts, although this difference was no longer statistically significant when adjusting for current negative affectivity. Owing to our cross-sectional design, we are unable to determine if this represents mediation, confounding, or suppression, although some research with adults suggests that firearm acquisition and negative affectivity have a bidirectional relationship, akin to a positive feedback loop.²⁹ Those findings may not generalize to firearm acquisition during early childhood, however, because the methods used for firearm acquisition during childhood and adulthood likely differ. State and federal law, for instance, have established minimum firearm purchase and possession ages (typically 18-21 years, although some states have minimum ages of 16)^{8,31} that restricts opportunities for children to legally acquire firearms on their own.

Participants who reported growing up in a home with a firearm also reported significantly increased rates of suicide attempts. In contrast to our findings specific to preadolescent firearm acquisition, however, having a firearm in one's childhood home were also associated with higher rates of suicide ideation (15.6% for those reporting a firearm in their childhood home versus 12.6% for those reporting no firearms in their childhood home). Although firearm availability during childhood was associated with suicide ideation and attempts, *current* firearm ownership was not, consistent with previous studies using nationally representative samples.^{21,22} Longitudinal research beginning in preadolescence is needed to better understand how the timing of firearm acquisition, negative affectivity, suicide ideation, and suicide attempts are temporally related. Overall, however, these findings suggest that even relatively milder forms of firearm exposure during childhood were associated with increased risk for suicidal thoughts and behaviors in our sample. Presumably the excess suicide attempts reported by participants reporting childhood firearm availability rarely, if ever, involved a firearm, thereby increasing the plausibility of survival.

In general, participants who had ever shot a firearm were more likely than those who had never shot a firearm to report a suicide attempt, consistent with the notion of acquired capability for suicide. In our adjusted models, only those participants who had first shot a firearm during adulthood had significantly elevated suicide attempts rates; those who had first shot firearms earlier in life did *not* have elevated suicide attempt rates, however, as would be hypothesized by contemporary theories based on the assumption that firearm use earlier in life would reflect higher levels of familiarity and exposure. This pattern may implicate different mechanisms underlying the relationships among firearm acquisition, firearm use, and suicidal thoughts and behaviors, and warrants further investigation.

Previous research has focused primarily on the correlation of firearm availability with suicide mortality. Although this research has provided important information about mortality risks associated with firearms, our understanding of how firearm exposure might be related to a broader range of adverse outcomes remains limited. The present study therefore expands our knowledge about different aspects of firearm exposure are correlated with other manifestations of suicide risk, notably suicide ideation and nonfatal suicide attempts, two common precursors to suicide death.²⁹ One possible implication of these results is that national suicide rates could be positively impacted via efforts aimed at limiting or restricting firearm availability during early childhood. As noted before, state and federal laws currently restrict firearm purchase by most children and adolescents.^{8,31} Overall, the effects of these laws on suicide rates are inconclusive.^{8-10,31-33} The majority of these studies focused on suicide mortality in the youngest age groups (<21 years of age) and did not investigate effects at the individual level, however, thereby precluding the ability to account for *actual* access and use of firearms during childhood at the person level and the possibility for delayed effects across the lifespan. Person-level analyses may therefore provide novel information about how firearm availability and suicide risk are related, thereby complementing previous research, the majority of which has examined aggregate correlations.

Unfortunately, the present study is unable to elucidate the mechanisms underlying the observed associations. One possibility is that early firearm exposure adversely effects cognitive control processes, a possibility implicated by laboratory-based studies showing increased reactivity and behavioral impulsivity among young adults while they are in physical possession of a firearm.^{34,35} Another possibility is that firearm exposure during early childhood serves as a proxy for other risk factors for suicide. Firearm acquisition and ownership, for example, are associated with higher rates of interpersonal trauma and victimization,³⁶⁻³⁸ each of which can lead to increased negative affectivity. Firearm availability during early childhood may therefore reflect exposure to other environmental, interpersonal, and/or psychological risk factors for suicide. Longitudinal studies are needed to test these possibilities.

Conclusions based on the present study are also limited by our self-report methodology, which could be vulnerable to response bias, although the anonymous response format of our survey likely improved self-disclosure of sensitive items.^{39,40} Our study is also limited by the use of quota sampling, which precludes our ability to know how representative our sample was of all U.S. adults. Because we did not use probabilistic sampling methods, our results could be biased to an unknown degree. Another related limitation is our inability to determine how similar (or not) survey completers were relative to all of the panel members who received an invitation to participate. Despite these limitations, quota sampling provides some advantages over convenience sampling and snowball sampling, namely ensuring sufficient participation of individuals from subgroups of interest. Although our sampling approach restricts the types of inferences that can be made, we were nonetheless able to examine relationships among variables and characteristics of interest across multiple subgroups—a primary reason for using quota sampling. Conclusions based on the present results should therefore be made cautiously and be considered preliminary until further research using probabilistic sampling methods can be accomplished.

Another limitation is the omission of any survey items that assess the extent to which participants identified as firearm *owners*, another related facet of firearm availability that could be relevant to suicide risk. A final limitation involves the timing of our data collection, which occurred during the first month of the novel coronavirus (COVID-19) outbreak in the U.S. Firearm purchases have increased sharply during the COVID-19 pandemic⁴¹ suggesting secular effects that may have influenced participant response patterns. Despite these limitations, our results suggest that certain aspects of firearm availability, especially firearm exposure during early childhood, was associated with increased risk for suicide ideation and suicide attempts, and warrant further empirical investigation aimed at reducing suicide.

Declarations

Ethics approval and consent to participate

This study was reviewed and approved by The University of Utah Institutional Review Board (IRB_00130434). This study presented no more than minimal risk of harm to subjects and involved no procedures for which written consent is normally required outside of the research context. We were therefore granted a waiver of documentation of consent. An information sheet outlining the study's purposes, procedures, and potential risks were described on the first page of the electronic survey along with the principal investigator's name and contact information. All participants consented by proceeding to the second page of the survey. All methods were performed in accordance with the Declaration of Helsinki and all other relevant guidelines and regulations.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Not applicable

Authors' contributions

CJB and AOB generated the research idea, obtained regulatory approval, and collected data. CJB analyzed the data. CJB, AOB, and MDA interpreted the results and wrote the manuscript.

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Tables

Table 1.

Item content and response options used to assess lifetime history of suicidal thoughts and behaviors and firearm exposure

Item Content	Response Options
Suicide ideation items	
Have you ever had any of the following thoughts for more than a few minutes?	
"I should kill myself"	No Yes
"I am going to kill myself"	No Yes
Suicide attempt items	
Have you ever done any of the following?	
Started to kill yourself and then you stopped after you had already taken some action.	No Yes
Started to kill yourself and then you decided to reach out for help after you already taken some action.	No Yes
Tried to kill yourself and someone found you afterwards.	No Yes
Tried to kill yourself and no one found you afterwards.	No Yes
Firearm exposure items	
Do you currently have a firearm in or around your home?	No Yes Don't know Prefer not to answer
Were there any firearms in your childhood home?	No Yes Don't know Prefer not to answer
How old were you when you first shot a firearm?	I have never shot a firearm Under 11 years old 11-15 years old 16-25 years old 26-30 years old Over 30 years old
How old were you when you acquired your first firearm?	I have never acquired a firearm Under 11 years old 11-15 years old 16-25 years old 26-30 years old Over 30 years old

Table 2.

Demographic characteristics of the full sample and rates of lifetime suicide ideation and suicide attempt within each demographic category

Variable	Full Sample n (%)	Lifetime SI n (%)	Lifetime SA n (%)
Sex			
Male	3038 (49.0%)	366 (12.0%)	202 (6.6%)
Female	3162 (51.0%)	508 (16.1%)	242 (7.7%)
Gender			
Male	3019 (48.7%)	362 (12.0%)	201 (6.7%)
Female	3150 (50.8%)	497 (15.8%)	237 (7.5%)
Transgender	16 (0.3%)	6 (37.5%)	2 (12.5%)
Other	15 (0.2%)	9 (60.0%)	4 (26.7%)
Age			
18-24 y	643 (10.4%)	201 (31.3%)	67 (10.4%)
25-34 y	1217 (19.6%)	249 (20.5%)	125 (10.3%)
35-44 y	1313 (21.2%)	204 (15.5%)	146 (11.1%)
45-54 y	857 (13.8%)	99 (11.6%)	60 (7.0%)
55-64 y	1136 (18.3%)	80 (7.0%)	30 (2.6%)
65-74 y	845 (13.6%)	35 (4.1%)	13 (1.5%)
75-84 y	181 (2.9%)	6 (3.3%)	3 (1.7%)
85+ y	8 (0.1%)	0 (0.0%)	0 (0.0%)
Race			
White	4041 (65.2%)	548 (13.6%)	281 (7.0%)
Hispanic, Latino, Spanish origin	919 (14.8%)	190 (20.7%)	96 (10.4%)
Asian	861 (13.9%)	113 (13.1%)	44 (5.1%)
Black	770 (12.4%)	135 (15.4%)	73 (9.5%)
Native American	288 (4.6%)	75 (26.0%)	42 (9.5%)
Pacific Islander	62 (1.0%)	17 (27.4%)	9 (14.5%)
Other	448 (7.2%)	78 (17.4%)	44 (9.9%)
Gun in home currently			
No	3729 (60.1%)	522 (14.0%)	229 (6.1%)
Yes	2311 (37.3%)	331 (14.3%)	206 (8.9%)
I don't know ^a	--	--	--
Prefer not to answer	160 (2.6%)	21 (13.1%)	9 (5.6%)
Gun in home as child			
No	3318 (53.5%)	419 (12.6%)	185 (5.6%)
Yes	2372 (38.3%)	369 (15.6%)	230 (9.7%)
I don't know	436 (7.0%)	76 (17.4%)	28 (6.4%)
Prefer not to answer	74 (1.2%)	10 (13.5%)	1 (1.4%)
Age when first shot firearm			
Never shot firearm	2273 (36.7%)	345 (15.2%)	128 (5.6%)
≤ 11 y	742 (12.0%)	109 (14.7%)	72 (9.7%)
11-15 y	1314 (21.2%)	182 (13.9%)	98 (7.5%)
16-25 y	1336 (21.5%)	166 (19.0%)	93 (7.0%)
≥ 26 y	535 (8.6%)	69 (7.8%)	53 (11.9%)
Age when first acquired firearm			
Never shot firearm	3626 (58.5%)	523 (14.4%)	211 (5.8%)
≤ 11 y	172 (2.8%)	28 (16.3%)	33 (19.2%)
11-15 y	456 (7.4%)	70 (15.4%)	45 (9.9%)
16-25 y	1111 (17.9%)	147 (13.2%)	90 (8.1%)
≥ 26 y	835 (13.5%)	106 (12.7%)	65 (7.8%)

^a No participants selected this response option.

Table 3.

Intercorrelations among categorical firearm exposure variables, computed as Cramer's V

		Age when first acquired firearm							
		Never acquired firearm	<11 y	11-15 y	16-25 y	≥ 26 y	χ^2	p	V
Gun in home currently							2765.0	<.001	0.47
No		87.1	20.3	24.6	23.9	45.8			
Yes		10.4	76.7	73.5	72.9	78.8			
Prefer not to answer		2.5	2.9	2.0	3.2	2.5			
Gun in home as child							1156.5	<.001	0.25
No		68.7	14.5	14.9	32.5	44.7			
Yes		22.1	80.2	81.1	59.9	47.3			
I don't know		8.0	2.9	3.3	6.4	6.7			
Prefer not to answer		1.2	2.3	0.7	1.2	1.3			
Age when first shot firearm							3938.2	<.001	0.40
Never shot firearm		59.6	9.9	1.1	3.3	6.5			
≤ 11 y		4.1	75.0	44.3	16.7	9.1			
11-15 y		13.3	10.5	48.9	35.6	23.2			
16-25 y		16.6	2.9	4.4	43.0	27.7			
≥ 26 y		6.4	1.7	1.3	1.4	33.5			
		Age when first shot firearm							
		Never shot firearm	<11 y	11-15 y	16-25 y	≥ 26 y	χ^2	p	V
Gun in home currently							1110.8	<.001	0.30
No		86.0	31.5	46.0	51.7	45.8			
Yes		11.9	65.9	50.7	45.3	52.3			
Prefer not to answer		2.1	2.6	3.3	3.0	1.9			
Gun in home as child							1595.3	<.001	0.29
No		76.8	12.4	31.3	55.1	62.2			
Yes		14.4	83.2	62.9	33.8	28.0			
I don't know		7.4	3.4	4.9	10.0	8.2			
Prefer not to answer		1.3	1.1	1.0	1.1	1.5			
		Firearm in childhood home							
		No	Yes	I don't know	Prefer not to answer		χ^2	p	V
Gun in home currently							1679.5	<.001	0.37
No		76.4	38.1	61.7	29.7				
Yes		22.4	59.9	30.5	17.6				
Prefer not to answer		1.2	2	7.8	52.7				

Table 4.

Results of unadjusted and adjusted logistic regression analyses

	OR (95% CI) ^a	aOR (95% CI) ^b	aOR (95% CI) ^c
Suicide Ideation			
Firearm in current home			
Prefer not to answer	0.93 (0.58-1.48)	0.90 (0.54-1.48)	0.88 (0.51-1.50)
Yes	1.03 (0.89-1.19)	1.08 (0.88-1.32)	0.96 (0.77-1.19)
No	1.00	1.00	1.00
Firearm in childhood home			
Prefer not to answer	1.08 (0.55-2.12)	1.19 (0.58-2.44)	1.05 (0.48-2.25)
I don't know	1.46 (1.12-1.91)	1.53 (1.17-2.01)	1.25 (0.93-1.68)
Yes	1.28 (1.10-1.48)	1.42 (1.18-1.70)	1.35 (1.11-1.65)
No	1.00	1.00	1.00
Age when shot first firearm			
26+ yrs	0.87 (0.66-1.14)	0.87 (0.65-1.18)	1.05 (0.75-1.46)
16-25 yrs	0.79 (0.65-0.97)	0.76 (0.61-0.95)	0.94 (0.73-1.20)
11-15 yrs	0.90 (0.74-1.09)	0.79 (0.62-0.996)	1.17 (0.91-1.52)
< 11 yrs	0.96 (0.76-1.22)	0.77 (0.57-1.04)	1.23 (0.89-1.69)
Never shot firearm	1.00	1.00	1.00
Age when acquired first firearm			
26+ yrs	0.86 (0.69-1.08)	0.84 (0.63-1.11)	0.92 (0.68-1.25)
16-25 yrs	0.91 (0.74-1.10)	0.89 (0.69-1.15)	0.76 (0.57-0.995)
11-15 yrs	1.08 (0.82-1.41)	1.00 (0.71-1.40)	0.78 (0.54-1.12)
< 11 yrs	1.15 (0.76-1.75)	1.06 (0.66-1.70)	0.56 (0.34-0.94)
Never acquired firearm	1.00	1.00	1.00
Suicide Attempts			
Firearm in current home			
Prefer not to answer	0.91 (0.46-1.81)	0.99 (0.4802.01)	1.10 (0.53-2.29)
Yes	1.50 (1.23-1.82)	1.04 (0.80-1.36)	0.94 (0.71-1.25)
No	1.00	1.00	1.00
Firearm in childhood home			
Prefer not to answer	0.23 (0.03-1.68)	0.21 (0.03-1.61)	0.16 (0.02-1.26)
I don't know	1.16 (0.77-1.75)	1.14 (0.75-1.73)	0.95 (0.62-1.47)
Yes	1.82 (1.49-2.22)	1.65 (1.31-2.12)	1.57 (1.22-2.03)
No	1.00	1.00	1.00
Age when shot first firearm			
26+ yrs	1.84 (1.32-2.57)	1.67 (1.14-2.43)	1.89 (1.25-2.85)
16-25 yrs	1.25 (0.95-1.65)	1.02 (0.75-1.39)	1.24 (0.90-1.73)
11-15 yrs	1.35 (1.03-1.77)	0.88 (0.63-1.22)	1.34 (0.95-1.90)
< 11 yrs	1.80 (1.33-2.43)	0.80 (0.54-1.20)	1.33 (0.88-2.01)
Never shot firearm	1.00	1.00	1.00
Age when acquired first firearm			
26+ yrs	1.37 (1.02-1.82)	1.02 (0.70-1.48)	1.03 (0.70-1.53)
16-25 yrs	1.43 (1.10-1.84)	1.25 (0.89-1.76)	1.09 (0.77-1.55)
11-15 yrs	1.77 (1.26-2.48)	1.53 (0.998-2.34)	1.17 (0.75-1.83)
< 11 yrs	3.84 (2.57-5.76)	3.43 (2.08-5.67)	2.09 (1.23-3.56)
Never acquired firearm	1.00	1.00	1.00
Suicide Attempts Among Ideators			

Firearm in current home			
Prefer not to answer	0.39 (0.11-1.33)	0.46 (0.12-1.69)	0.46 (0.12-1.74)
Yes	1.39 (1.04-1.86)	0.89 (0.60-1.32)	0.89 (0.59-1.34)
No	1.00	1.00	1.00
Firearm in childhood home			
Prefer not to answer	0.28 (0.04-2.21)	0.38 (0.04-3.38)	0.32 (0.03-2.90)
I don't know	1.02 (0.59-1.74)	1.06 (0.61-1.84)	1.03 (0.59-1.82)
Yes	1.54 (1.14-2.08)	1.43 (1.001-2.04)	1.40 (0.97-2.01)
No	1.00	1.00	1.00
Age when shot first firearm			
26+ yrs	2.11 (1.25-3.57)	1.74 (0.97-3.11)	1.59 (0.87-2.92)
16-25 yrs	1.66 (1.12-2.47)	1.41 (0.91-2.19)	1.43 (0.91-2.25)
11-15 yrs	1.24 (0.84-1.84)	0.92 (0.58-1.45)	1.01 (0.62-1.62)
< 11 yrs	1.89 (1.20-2.97)	1.16 (0.66-2.02)	1.27 (0.71-2.26)
Never shot firearm	1.00	1.00	1.00
Age when acquired first firearm			
26+ yrs	1.70 (1.10-2.61)	1.35 (0.78-2.33)	1.31 (0.75-2.30)
16-25 yrs	1.54 (1.05-2.27)	1.34 (0.83-2.19)	1.38 (0.84-2.29)
11-15 yrs	1.53 (0.91-2.57)	1.34 (0.72-2.51)	1.32 (0.69-2.53))
< 11 yrs	2.98 (1.38-6.42)	2.62 (1.08-6.35)	2.40 (0.96-5.96)
Never acquired firearm	1.00	1.00	1.00

Note: Values in bold are statistically significant at $p < .05$.

^a Univariate analysis

^b Multivariate analysis adjusting for all firearm exposure variables

^c Multivariate analysis adjusting for all firearm exposure variables, sex, age, race, and annual household income, and negative affectivity