

Assessing Firearm Ownership, Firearm Storage, and Past Year Dental Care Use

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Abstract

Recently, efforts have emerged to increase firearm secure storage counseling in healthcare settings. However, dental clinics have been notably absent from this effort. This study examined household firearm ownership and firearm storage practices among individuals who have recently visited a dental clinic. Data were from the 2024 Behavioral Risk Factor Surveillance System across 17 states that administered the state-optional Firearm Safety module. Multiple logistic regression assessed the association between household firearm ownership, firearm storage patterns, and having a dental visit in the past year. In a covariate-adjusted model, those in firearm-owning households were significantly less likely to have a past-year dental visit (OR = 0.919, 95% CI = 0.856, 0.986, $p = .019$). Expressed as predicted probabilities, 69.0% of those in households without a firearm, compared to 67.4% of respondents in households with a firearm, had a dental visit in the past year. Among those in firearm-owning households, having firearm(s) stored loaded and unlocked is associated with a lower odds of past-year dental care visit (OR = .873, 95% CI = .774, .985, $p = .027$). This translates to 70.7% of respondents in households with a firearm stored unloaded/locked having visited a dental provider in the past year, compared to 68.1% of those in a household with a firearm stored loaded and unlocked.

Keywords: firearm ownership, secure storage, dental care, public health, injury prevention, BRFSS.

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Introduction

Firearm-related injuries and deaths are a critical public health concern in the United States (US) (Surgeon General of the United States, 2024). In 2023 alone, firearms accounted for nearly 46,000 deaths (CDC Wonder, 2024), with many more individuals suffering nonfatal firearm-related injuries (Kaufman et al., 2024). Recognizing these profound and far-reaching issues, the US Surgeon General declared firearm violence a public health crisis in a landmark 2024 report (Surgeon General of the United States, 2024).

Efforts to reduce firearm-related harm have increasingly focused on promoting secure firearm storage, defined as keeping firearms unloaded, locked, and stored

separately from ammunition (Carter & Cunningham, 2024). From a health behavior perspective, secure firearm storage represents a modifiable protective behavior that can be influenced in healthcare settings through provider–patient communication to promote harm-reduction practices (Carter & Cunningham, 2024; Rowhani-Rahbar et al., 2016). Even so, nearly 30% of firearm owners report storing at least one firearm loaded and/or unlocked (Berrigan et al., 2019).

To promote greater firearm safety, healthcare providers play a crucial role in preventing firearm injuries by counseling patients on secure storage practices (Carter & Cunningham, 2024). In 2025, a collaboration between the American Medical Association

and the Ad Council launched the “Agree to Agree” initiative, designed to help clinicians feel better prepared and supported when discussing firearm injury prevention with their patients (American Medical Association, 2025). While firearm secure storage screening and counseling have gained traction in primary care and pediatric settings, dental clinics have been largely overlooked as a setting for firearm safety interventions.

The absence of dental care providers in firearm storage counseling creates a significant gap for several reasons. First, dental care reaches a broad and diverse population, including many who do not regularly visit a dental care provider. Indeed, prior studies suggest tens of millions of Americans visit a dental provider but not a general health care provider each year (Manski et al., 2022; Strauss et al., 2012), and nearly four in five children and two-thirds of adults in the US visit a dentist annually (Adjaye-Gbewonyo & Back, 2021; Cha & Cohen, 2022). Thus, having firearm storage counseling solely targeted at physicians potentially overlooks millions of Americans each year. Second, dental clinics are well-suited for potential firearm safety counseling, given that they are increasingly incorporating screening for social and behavioral risks on topics such as mental health (Smith et al., 2024), tobacco cessation (Neumann et al., 2019), and food insecurity (Radandt et al., 2018). Accordingly, integrating brief, nonjudgmental conversations about secure firearm storage represents a natural extension of existing prevention-oriented practices. Third, there has been a recent call to attention to this issue, highlighting the potential utility of firearm secure storage counseling within dental care (Testa & Mungia, 2025). Yet, a significant gap that remains on this topic is that there are no estimates of the prevalence of firearm ownership or storage practices among those who visit dental practices in the

US. Establishing baseline data on firearm access and storage among dental care users is a necessary step for determining how dentistry can contribute to broader public health strategies to reduce firearm injuries. To fill this gap, the current study uses the 2024 Behavioral Risk Factor Surveillance System (BRFSS) data to examine the prevalence of firearm ownership and storage practices among individuals who use dental care services.

Data

Data for this study were drawn from the 2024 BRFSS, an ongoing, state-administered telephone survey conducted by state health departments with coordination and support from the Centers for Disease Control and Prevention. The BRFSS collects information from noninstitutionalized U.S. adults aged 18 years and older and applies survey weights to produce population-representative estimates of health behaviors, preventive health practices, and risk factors. Although the core questionnaire is implemented annually across all 50 states and Washington, DC, states may choose to administer additional optional modules on selected topics. For the present analysis, we used data from 17 states that elected to include the optional firearm safety module, which contains items assessing household firearm ownership and firearm storage practices (see Appendix A for list of states).

Patients and/or the public were not involved in the design, conduct, reporting, or dissemination plans of this research. The BRFSS data are publicly available and deidentified. Accordingly, the use of the BRFSS for this study was exempt from Institutional Review Board approval. Missing data were handled using listwise deletion. Multiple imputation was not used because the sample size was relatively large. Thus, there were no concerns about statistical power because logistic regression with

listwise deletion yields unbiased regression coefficients when the dependent variable is not missing at random (Allison, 2014). The sample selection procedures are detailed in Appendix B.

Household Firearm Ownership

Respondents are asked, “Are any firearms now kept in or around your home?” Respondents who answered yes were coded as household firearm owners, whereas those who responded no were classified as not having a firearm in the home (Testa et al., 2024).

Firearm Secure Storage

Household firearm storage practices were assessed among respondents who indicated household firearm ownership. Respondents were first asked, “Are any of these firearms now loaded?” (yes or no). Those who indicated the presence of loaded firearms were subsequently asked, “Are any of these firearms also unlocked?” (yes or no). Responses to these items were used to construct two variables. Among the subsample of households who reported owning firearms, we create a binary indicator of whether firearms were stored loaded and unlocked (1 = yes; 0 = no) (Testa et al., 2025).

Dental Care Use

Dental care use was assessed using the question: “Including all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists, as well as dental hygienists, how long has it been since you last visited a dentist or dental clinic for any reason?” Participants could select one of the following responses: (a) within the past year (anytime < 12 months ago), (b) within the past 2 years (1 year but < 2 years ago), (c) within the past 5 years (2 years but < 5 years ago), (d) 5 or more years ago or (e) never. We classified respondents as having a past-year dental visit or having a visit more than a year ago (Lutfiyya et al., 2019).

Control Variables

Control variables included demographic, socioeconomic, and contextual factors. Demographic variables included respondent age (18–24, 25–34, 35–44, 45–54, 55–64, or 65 years and older), sex (male or female), race/ethnicity (non-Hispanic White, non-Hispanic Black, non-Hispanic Multiracial, non-Hispanic other race, or Hispanic), and marital status (married, divorced or separated, widowed, never married, or part of an unmarried couple). Socioeconomic indicators included educational attainment (less than high school, high school graduate, some college, or college graduate) and household income (<\$25,000, \$25,000 - \$49,999, \$50,000 - \$74,999, \$75,000 - \$99,999, \$100,000 - \$149,999, or ≥ \$150,000). A variable was included on whether a respondent currently had health insurance (yes or no). Additional covariates included whether a child lived in the home (yes or no) and veteran status (yes or no). Finally, analyses controlled for urbanicity (urban vs. rural) and state of residence.

Analytic Approach

First, we presented summary statistics for the analytic sample, including those who responded to the firearm safety module ($n = 81,090$) and those residing in firearm-owning households ($n = 31,345$). Next, we estimated bivariate and multivariable logistic regression to assess the relationship between (a) household firearm ownership, and (b) household firearm storage on past year dental visit. All analyses adjust for BRFSS survey weights and complex survey design using the svy command in Stata.

Results

Table 1 shows that 68.5% had visited a dentist in the past year, and 33.4% resided in firearm-owning households. Among those in firearm-owning households, 70.3% had

Table 1
Summary Statistics from 2024 Behavioral Risk Factor Surveillance System

Variable	Participated in Firearm Safety Module (Unweighted N = 81,137) (Weighted N = 57,171,966)		Firearm Owning Households (Unweighted N = 31,369) (Weighted N = 18,567,290)	
	Weighted %	Unweighted N	Weighted %	Unweighted N
<i>Household Firearm Ownership</i>				
No	66.6%	48,957	—	—
Yes	33.4%	32,166	—	—
<i>Firearm Stored Loaded & Unlocked</i>				
No	—	—	83.9%	25,930
Yes	—	—	16.1%	5,439
<i>Past Year Dental Visit</i>				
No	31.5%	24,527	29.7%	8,754
Yes	68.5%	56,590	70.3%	22,615
<i>Age</i>				
18-24	8.5%	3,668	6.8%	1,032
25-34	16.2%	8,479	14.0%	2,646
35-44	17.7%	11,327	16.7%	4,022
45-54	16.6%	11,987	17.3%	4,857
55-64	17.2%	15,040	19.1%	6,344
65+	23.8%	30,636	26.0%	12,468
<i>Sex</i>				
Female	51.1%	43,006	42.7%	14,198
Male	48.9%	38,131	57.3%	17,171
<i>Race/Ethnicity</i>				
Non-Hispanic White	57.6%	61,142	73.5%	26,445
Non-Hispanic Black	12.3%	7,732	11.0%	2,301
Non-Hispanic Other	9.3%	3,217	4.8%	786
Non-Hispanic Multiracial	2.2%	1,563	2.3%	575
Hispanic	18.6%	7,483	8.4%	1,262
<i>Marital Status</i>				
Married	52.7%	41,743	62.1%	19,586
Divorced/Separated	12.9%	13,011	11.6%	4,072
Widowed	6.5%	8,476	6.1%	2,948
Never Married	22.3%	14,037	15.9%	3,547
Member of an Unmarried Couple	5.7%	3,870	4.4%	1,216
<i>Educational Attainment</i>				
Less than High School	9.7%	4,069	5.7%	964
High School Graduate	24.8%	18,759	26.5%	7,532
Some College	30.7%	21,415	35.0%	9,242
College Graduate	34.8%	36,894	32.7%	13,631
<i>Income (\$)</i>				
<25,000	14.1%	11,631	7.1%	2,561
25,000-49,999	23.7%	20,063	19.9%	6,982
50,000-74,999	14.6%	13,254	16.6%	5,583

75,000-99,999	13.4%	11,382	16.5%	5,132
100,000-149,999	15.2%	12,310	18.8%	5,699
≥150,000	19.0%	12,497	21.1%	5,412
<i>Current Health Insurance</i>				
No	6.5%	4,174	4.2%	1,039
Yes	93.5%	76,963	95.8%	30,330
<i>Child in Home</i>				
None	66.4%	60,710	67.1%	23,687
1 or More	33.6%	20,427	32.9%	7,682
<i>Urbanicity</i>				
Rural	6.1%	11,275	10.8%	6,271
Urban	93.9%	69,862	89.2%	25,098

Table 2

Results of Multiple Logistic Regression Between Household Firearm Ownership, Household Firearm Storage, and Past Year Dental Care Use

Variable	Covariate Adjusted
	aOR (95% CI)
Household Firearm Ownership	0.919* (0.856 – 0.986)
Firearm Loaded and Unlocked	0.873* (0.774 - 0.985)

*** $p < .001$, * $p < .05$

Note. Each column represents a separate logistic regression model for the exposure of (a) household firearm ownership, and (b) firearm loaded and unlocked. Models include the following control variables: age, race/ethnicity, marital status, educational attainment, income, health insurance, child in home, military veteran, urban/rural, and state of residence. Household firearm ownership unweighted $n = 81,137$; weighted $n = 57,171,966$. Firearm Loaded and Unlocked unweighted $n = 31,345$; weighted $n = 18,567,095$. Abbreviations: aOR = adjusted odds ratio; CI = confidence interval

visited a dentist in the past year, and 16.1% reported firearms being stored loaded and unlocked. Table 2 shows that in a covariate-adjusted model, those in firearm-owning households were significantly less likely to have a past-year dental visit ($OR = 0.919$, 95% $CI = 0.856, 0.986$, $p = .019$). Expressed as predicted probabilities, 69.0% of those in households without a firearm, compared to 67.4% of respondents in households with a firearm, had a dental visit in the past year.

Among those in firearm-owning households, having firearm(s) stored loaded and unlocked is associated with a lower odds of past-year dental care visit ($OR = .873$, 95% $CI = .774, .985$, $p = .027$). This translates to 70.7% of respondents in households with a firearm stored unloaded/locked having visited a dental provider in the past year, compared to 68.1% of those in a household with a firearm stored loaded and unlocked. In sensitivity analyses, results remained substantively similar using multiple imputation.

Discussion

Firearm owners and those living in households with firearms stored loaded and unlocked were less likely to have visited a dental provider in the past year. Even so, the findings suggest the difference between past-year dental visits based on household firearm ownership and firearm storage as loaded and unlocked is negligible. These findings point to an opportunity for dental professionals to contribute to firearm injury prevention efforts. Dentistry has increasingly recognized the importance of addressing social determinants of health (National Institute of Dental and Craniofacial Research, 2023), and firearm secure storage counseling aligns with this broader commitment to patient well-being (Carter & Cunningham, 2024; Testa & Mungia, 2025). The implementation of

firearm storage counseling within the dental setting also fits within the pyramid of evidence-based approaches to firearm injury prevention, considering that firearm storage counseling in medical settings is increasingly common (Carter & Cunningham, 2024), and studies suggest that secure storage can reduce unintentional firearm injuries, suicides, and firearm-related assaults (Rowhani-Rahbar et al., 2016). Future research should explore the feasibility and acceptability of integrating firearm secure storage discussions into dental care settings, including potential implementation strategies such as incorporating screening questions into electronic health records, developing brief educational interventions, and training dental providers to effectively communicate firearm safety messages to patients.

The results of this study should be considered in the context of its limitations. Firearm ownership, storage, and dental care use are self-reported, which may introduce reporting biases, including social desirability bias. Additionally, firearm storage practices were measured using a limited set of survey items; future studies should consider more detailed assessments of firearm security measures. Finally, only 17 states participated in the firearm safety module of the BRFSS, which limits the generalizability of the findings to the broader US population.

Implications for Health Behavior Research

This study contributes to the field of health behavior research by identifying dental clinics as an overlooked yet promising setting for preventing firearm injuries. In doing so, this study broadens the understanding of how health behavior researchers conceptualize where preventive behaviors can be shaped and reinforced. For researchers, these findings point to several next steps. Future work should develop measures to assess dental providers'

readiness to engage in firearm safety counseling, evaluate patient receptivity, and test intervention models grounded in behavioral theory. For practitioners and policymakers, these findings suggest the need to pilot-test firearm storage counseling in dental training programs and clinical practice. Collectively, this study fills an important gap by providing the first national estimates of firearm ownership and storage practices among dental care users and establishes a foundation for expanding behavioral health research into new, prevention-oriented contexts.

Discussion Questions

The estimates produced by this study raise important questions for researchers and practitioners to consider moving forward. How can health behavior theories be applied or adapted to guide the development of firearm secure storage counseling interventions delivered in dental practice settings? Which theoretical frameworks are best suited to inform firearm injury prevention efforts within oral health care, and how might they need to be modified to reflect the unique patient–provider dynamics in dentistry? In addition, what practical, workflow, or organizational strategies can support integrating firearm injury prevention initiatives into dental settings while preserving patient trust, comfort, and the integrity of the clinical encounter? Addressing these questions is a critical next step to advancing feasible approaches to firearm secure storage counseling in dental care.

Conflicts of Interest: The authors report no conflicts of interest.

Funding: No funding was received for this study.

Ethics Statement: The BRFSS data are publicly available and deidentified. Accordingly, the use of the BRFSS for this study was exempt from Institutional Review Board approval.

Availability of data and materials: The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request. The BRFSS data are publicly available at: <https://www.cdc.gov/brfss/index.html>

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Appendix A: List of States in Analytic Sample

State	Participated in Firearm Safety Module (N = 81,137)		Firearm Owning Households (N = 31,369)	
	Frequency	Percentage	Frequency	Percentage
California	4,314	5.32	831	2.65
Illinois	8,868	10.93	1,917	6.11
Indiana	8,105	9.99	3,426	10.92
Louisiana	2,867	3.53	1,514	4.83
Maine	8,128	10.02	3,458	11.02
Michigan	6,838	8.43	2,752	8.77
Minnesota	9,773	12.05	3,650	11.64
Mississippi	2,065	2.55	1,226	3.91
Nevada	156	0.19	73	0.23
New Jersey	4,995	6.16	737	2.35
New Mexico	2,233	2.75	862	2.75
North Carolina	2,357	2.9	933	2.97
Oregon	3,814	4.7	1,397	4.45
South Carolina	5,508	6.79	2,631	8.39
Virginia	3,932	4.85	1,655	5.28
West Virginia	4,194	5.17	2,456	7.83
Wyoming	2,990	3.69	1,851	5.9

Appendix B: Sample Selection Criteria

Criteria	Participated in Firearm Safety Module	Firearm Owning Households
Participated in 2024 BRFSS	$n = 475,670$	$n = 475,670$
	↓	↓
Participated in Firearm Safety Module	$n = 99,396$	$n = 99,396$
	↓	↓
Had Response on Dental Care Use	$n = 98,325$	$n = 98,325$
	↓	↓
Had Response on Firearm Storage	N/A	$n = 36,520$
	↓	↓
Had Response on Covariates	$n = 81,090$	$n = 31,345$