

Safe Firearm Storage Among Oklahoma Households with Children: An Analysis of the 2021 Behavioral Risk Factor Surveillance System



Hayden Jacobs, M.P.H.,¹ Jennifer Briggs, D.O.,² Jason Beaman, D.O.,⁴ Natasha Bray, D.O.,¹ Micah Hartwell, Ph.D.^{1,3}

1. Oklahoma State University College of Osteopathic Medicine at Cherokee Nation, Office of Medical Student Research, Tahlequah, Oklahoma; 2. Oklahoma State University Medical Center, Department of Emergency Medicine, Tulsa, Oklahoma; 3. Oklahoma State University Center for Health Sciences, Department of Psychiatry and Behavioral Sciences, Tulsa, Oklahoma; 4. Oklahoma State University Center for Health Sciences, School of Forensic Sciences, Tulsa, Oklahoma

BACKGROUND

- Firearm-related injuries represent a significant public health concern in the United States.
- Most common cause of unintentional firearm injury is mishandling of a weapon, for children and adults alike.¹
- Given that proper and secure gun storage has been shown to reduce the risk of unintentional injuries and suicides involving firearms,^{2,3} identifying patterns of gun storage practices is crucial to reduce the occurrence of firearm-related injuries and deaths.
- Study aims to fill the existing knowledge gaps by assessing rates of various gun storage practices in the state of Oklahoma overall and among gun owners with children in the household.

METHODS

- We performed a cross-sectional analysis using 2021 CDC BRFSS optional Firearm Safety module data to assess firearm storage patterns in homes with children in Oklahoma.
- We determined presence of children from household data (binary variable) and extracted race/ethnicity, urbanicity, educational attainment, and income.
- We calculated sample and population estimates of gun ownership with children and stratified gun storage patterns based on sociodemographic factors.
- Used design-based X² tests, applied sampling weights, and survey design from BRFSS using Stata v16.1.

RESULTS

- A total of 3970 participants responded to the prompt, “Are any firearms now kept in or around your home?”, of which 1926 reported having a firearm – or 46.62% of Oklahomans. 31.31% of households with firearms also reported having children in the home.
- Our results showed a statistically significant association in gun storage strategies among houses with and without children (X² = 19.0, P > 0.001; Table 1).
- Among households with children, educational attainment was the only sociodemographic variable we examined that was significantly associated with firearm storage strategies (X² = 2.92, P > 0.01; Table 2).

Variable	Not loaded No. (%)	Loaded & Locked away No. (%)	Unsure if loaded or locked away No. (%)	Loaded and Not locked away No. (%)	Total No. (%)	X ² , P
No Children in Household	681 (50.0)	221 (16.0)	68 (4.5)	424 (30.0)	1394 (69.7)	19.0, <.001
Children in Household	323 (63.6)	116 (21.3)	16 (3.1)	65 (12.0)	520 (30.3)	
Total	1004 (54.1)	337 (17.6)	84 (4.1)	489 (24.2)	1914 (100.0)	

Table 1. Association of safe gun storage and the presence of having children in the home in Oklahoma (sample = 1914, population estimate = 1,020,932).

Variable	Not loaded No. (%)	Loaded & Locked away No. (%)	Unsure if loaded or locked away No. (%)	Loaded and Not locked away No. (%)	Total No. (%)	X ² , P
Urbanicity						2.17, .09
Urban	280 (65.3)	97 (20.5)	12 (2.8)	50 (11.4)	439 (87.7)	
Rural	43 (51.5)	19 (26.7)	4 (5.7)	15 (16.2)	81 (12.3)	
Total	323 (63.6)	116 (21.3)	16 (3.1)	65 (12.0)	520 (100.0)	
Race						1.18, .28
White	227 (63.5)	79 (20)	14 (4)	46 (12.5)	366 (69.9)	
Black	13 (72.5)	5 (18.2)	0 (0)	2 (9.3)	20 (4.2)	
Asian	0 (0)	0 (0)	0 (0)	1 (100)	1 (0.1)	
NA/AN	31 (54.1)	19 (36.2)	1 (1.1)	5 (8.6)	56 (11.7)	
Hispanic	24 (66.2)	7 (21.7)	0 (0)	6 (12)	37 (6.7)	
Other race	28 (73.4)	6 (10.9)	1 (3.1)	5 (12.5)	40 (7.3)	
Age						1.14, .33
18-29	45 (60.7)	18 (25.3)	4 (6.2)	6 (7.4)	73 (14.1)	
30-49	217 (64.5)	76 (20.9)	8 (2.4)	45 (12.3)	346 (67.1)	
50-65	44 (66.5)	15 (20.4)	1 (1.4)	9 (11.7)	69 (13.1)	
65+	17 (53.6)	7 (16.4)	3 (8.4)	5 (21.6)	32 (5.7)	
Income						1.62, .11
< \$25,000	26 (67.9)	11 (27.26)	0 (0)	3 (4.84)	40 (8.18)	
\$25,000-50,000	60 (68.35)	17 (19.72)	2 (1.67)	10 (10.26)	89 (17.89)	
\$50,000-100,000	108 (62.99)	36 (17.3)	10 (5.83)	28 (13.88)	182 (36.89)	
\$100,000+	106 (61.06)	46 (26.21)	3 (1.46)	19 (11.27)	174 (37.04)	
Education						2.92, .0019
Did not graduate HS	10 (100)	0 (0)	0 (0)	0 (0)	10 (2.1)	
Graduated HS	53 (48)	28 (28.1)	6 (6.1)	22 (17.8)	109 (20.6)	
Some College	99 (61.1)	38 (18.9)	6 (3.7)	24 (16.4)	167 (32.3)	
Graduate College	159 (70.4)	50 (21.1)	4 (1.5)	19 (7)	232 (45)	

Table 2. Association of demographics and safe gun storage among households with children in Oklahoma (sample 520, population estimate = 309,459)

DISCUSSION

- We found that gun possession among Oklahoma households is ~ 46%. Nearly 1/3 of households with firearms reported children in the home.
- 12% of families with children store their firearms unlocked and loaded – counter to AAP recommendations.
- This work highlights the frequency of potentially unsafe pediatric exposure to firearms and the continued need for education regarding safe firearm practices.
- Primary care doctors may play a critical role in prevention through discussions regarding firearm storage and safety with families and reducing firearm injury recurrence among individuals seeking treatment and their families.

CONCLUSION

- Approximately 1 in 6 Oklahoma households with children have firearms that are unsafely stored or with unknown accessibility.
- We recommend that parents in all homes, with or without firearms, educate their children on firearm safety.
- Clinicians in primary care settings, including the emergency department, trained in identifying risk factors – such as gun accessibility and mental illness – and how to engage in such discussion may reduce firearm-related morbidity and mortality.

References

- Schnick SJ, Hemenway D. Unintentional firearm deaths in the United States 2005-2015. *Inj Epidemiol.* 2019;6:42.
- Miller M, Azrael D, Hemenway D, Vintois M. Firearm storage practices and rates of unintentional firearm deaths in the United States. *Accid Anal Prev.* 2005;37(4):661-667.
- Shenassa ED, Rogers ML, Spalding KL, Roberts MR. Safer storage of firearms at home and risk of suicide: a study of protective factors in a nationally representative sample. *J Epidemiol Community Health.* 2004;58(10):841-848.