

CLEARINGHOUSE **FOR MILITARY FAMILY READINESS**

An Overview of the Research of Firearm Storage in Military Families

Rapid Literature Review

Clearinghouse Technical Assistance Team

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Introduction

The Technical Assistance (TA) team at the Clearinghouse for Military Family Readiness at Penn State (Clearinghouse) received a request from Uniformed Services University to review research on the following:

- *Evidence on programs that reduce unsecured firearm-storage risks.*
- *Suggestions for further research to enhance this field.*
- *Assessment of military families' protective firearm-storage and carry practices.*

Having unsecured firearms in residences, whether loaded or unloaded, can create a public health and safety concern and may put individuals at risk for potential harm. Research has explored various interventions that intend to encourage safe firearm-storage practices that could mitigate this risk. Some of these interventions or mediations include strategies that provide direct access to safety devices; engage communities by hosting awareness events; and remove financial barriers to purchasing safety devices, such as gun cases or safes or a trigger lock. Implementing these types of strategies has shown the greatest potential for effectiveness. This discussion synthesizes findings from key studies to understand the nature of these interventions and their impact on firearm safety.

Research that examines this topic was identified by searching peer-reviewed journal articles and grey literature, and an emphasis was placed on research published in the last 10 years. Search queries included combinations of the following terms: *gun, ownership, safe, Veteran, military, family, community, and program*. Search platforms included ProQuest, Google Scholar, Penn State Libraries, PubMed, and Consensus AI.

This review provides a rapid, preliminary examination of the research. It is not intended to serve as a comprehensive review of the literature, and, except for the Clearinghouse's Continuum of Evidence (Continuum), the resources provided are not endorsed by the Clearinghouse. The information about the resources is provided to help professionals make data-driven decisions regarding potential next steps.

Evidence on Programs that Reduce Unsecured Firearm-Storage Risks

Much of the existing research in this domain focuses on relationships and associations between firearm ownership, firearm-storage practices, and self-harm via firearm (Rowhani-Rahbar et al., 2016). However, according to our review of the literature, no consistent evidence exists that links specific firearm-storage programs to a measurable reduction in firearm-related risks (e.g., death by suicide or a non-fatal suicide attempt). Instead, the current body of research emphasizes the effectiveness of individual program components, such as offering free safety devices, rather than examining program implementation or long-term impacts on reducing risk factors. While this does not suggest that programs targeting firearm-safe storage are inherently ineffective, the lack of rigorous

evidence limits the ability to draw definitive conclusions or establish generalizations about the programs' impacts.

Limitations in Research Rigor

Several limitations in the studies the TA team identified constrain the strength and applicability of their findings. Many studies had small sample sizes, which reduced the statistical power and generalizability of the results. In addition, most research relied heavily on self-reported data and lacked essential research elements such as control groups, random selection, or random assignment. Moreover, the absence of longitudinal designs means that long-term outcomes remain largely unmeasured, including sustained changes in firearm-storage practices or risk reductions. These methodological challenges underscore the need for more robust and comprehensive research to provide stronger evidence of effectiveness.

An example that illustrates these limitations is the study by Simonetti and colleagues (2018), which involved a sample size of 206 participants. This study sought to conduct a preliminary pre/post evaluation of a community-based firearm-storage intervention using various modes (e.g., social media campaigns, radio adverts, flyers) of delivering safety messages (e.g., "Store firearms unloaded and locked using a safety device such as a safe, lock box, trigger lock or chamber lock") (Simonetti et al., 2018, p.219). Posttest data indicated a statistically significant increase in reported safe firearm-storage practices following the intervention. However, the researchers could not determine whether this increase reflected an observable impact of the program. The authors noted that the small sample size and lack of a more rigorous experimental design might have contributed to the study's limited findings. This example highlights the potential of such interventions and the need for improved research designs to better assess program effectiveness and impact.

Despite the challenges in assessing the overall effectiveness of firearm-storage programs, examining the individual components of these programs provides valuable insights into what may contribute to safer firearm practices. By understanding the role of elements such as offering free safety devices or implementing tailored interventions, one can identify strategies that can be used to potentially mitigate risks and inform the development of more impactful, evidence-based programs. The following section highlights key components observed in existing programs and their potential contributions to firearm safety.

Community-Based Interventions

Community-based firearm-safety events play a crucial role in improving storage practices. Due to a lack of research, some of the following interventions may not be discussed at any length in this report. Community-based interventions may include:

- Lethal means counseling,
- Public health campaigns working in collaboration with local firearm retailers,

- Public awareness and outreach campaigns,
- Providing safety devices (e.g., gun locks, safes),
- Community-based firearm safety training,
- Outside of home safe storage sites.

For example, The Signpost, Assess, Facts, Emotion, Recommend (SAFER) program is a community-based prevention initiative aimed at promoting safer firearm storage behaviors to mitigate suicide risk. The program fosters dialogue and education on safe storage practices by distributing free resources and engaging participants through event-based outreach. An evaluation by Stuber et al. (2021) using a pre/posttest design (n=372) revealed that 61% of post-assessment respondents found the program highly valuable. Additionally, there was a significant improvement in safe firearm storage behaviors among participants who completed both assessments, increasing from 51.2% at pre-assessment to 66.0% at post-assessment ($p < 0.01$) (Stuber et al., 2021). Community-based interventions may have a positive impact in promoting safer firearm storage practices and reducing suicide risk through education, resource distribution, and active participant engagement.

Free and Economic Incentivized Safety-Device Interventions

Rowhani-Rahbar and colleagues (2016) conducted a systematic review of randomized and quasi-experimental controlled studies focusing on interventions promoting safe firearm storage. The team's review found that there may be merit in pursuing research into how the cost of firearm-storage interventions (i.e., free firearm safety-devices, coupons or discounted firearm safety devices) impacts firearm safety-device usage. The heterogeneity of the reviewed interventions limited the authors from making any generalizable conclusions. However, their findings may point to areas for further research (Rowhani-Rahbar et al., 2016).

The most promising evidence found in the review underscores the effectiveness of providing free firearm safety devices, such as trigger locks or gun cabinets. Programs that directly supply these tools consistently and free of charge result in improved storage practices by participants. The findings regarding these interventions are consistent with previous research demonstrating that eliminating economic and time barriers is an effective strategy in public health (Rowhani-Rahbar et al., 2016). This approach demonstrates that removing barriers to gun-safety tools may be a factor in encouraging the secure storage of firearms (Rowhani-Rahbar et al., 2016). However, In contrast to free-to-use safety devices, interventions reviewed that relied solely on economic incentives, such as coupons or discounts for purchasing safety devices, were shown to have limited success (Rowhani-Rahbar et al., 2016). Further research is needed to understand the relationship between full or partial economic incentivization and firearm safe-storage behaviors.

Combining Approaches for Greater Impact

The evidence suggests that the most successful programs integrate multiple strategies. Offering free safety devices directly addresses financial and logistical barriers, while hosting community-based events fosters local engagement and accountability. These approaches may create a programmatic framework for encouraging safer firearm-storage practices. The hands-on nature of these events, combined with removing financial obstacles, increases the chances that participants are equipped and motivated to implement safe storage practices (Rowhani-Rahbar et al., 2016; Simonetti et al., 2018).

Implications for Future Programming

The findings point to clear priorities for designing future interventions targeting safe-storage of firearms. Policymakers and community organizations may consider initiatives that offer free or subsidized safety devices to maximize impact. Additionally, engaging communities through education and interactive events can further amplify the reach and effectiveness of these programs. Community-based approaches further enhance efforts by creating a sense of shared responsibility and awareness (Simonetti et al., 2018).

Addressing the underlying barriers to safe-storage practices requires a multifaceted approach that combines accessibility to means of storage, education around safe-storage practices, and community involvement in the implementation of safe-storage programming. Together, these strategies offer a robust framework for reducing the risks associated with unsecured firearms in residences.

Assessment of Military Families' Protective Firearm-Storage and Carry Practices

The intersection of firearm-storage and carrying practices and the unique characteristics of military-connected families provide important insights into risk and protective factors. Research has examined the attitudes, behaviors, and factors that influence firearm safety among Service members, veterans, and their families. For example, Dempsey and colleagues (2019) examined the association between firearm ownership, accessibility, and storage practices and the risk of suicide among U.S. Army Soldiers. The team found that “suicide risk was associated with the ownership of one or more firearms, the storage of a firearm loaded with ammunition at home, and the carrying of firearms in public while off duty” (Dempsey et al., 2019, p.5). This evidence highlights opportunities for initiating targeted interventions (e.g., interventions aimed at military family members) and addressing challenges (e.g., Service member misperceptions about suicide risk) to promote safe practices. This concept is discussed in the following sections.

Fearlessness About Death and Sensation Seeking

One study (n=432) revealed that the military personnel in the study, mainly National

Guardsmen, who stored firearms in unsecured locations and kept them loaded exhibited higher levels of fearlessness about death—a key marker associated with an increased capability for committing suicide (Khazem et al., 2015). Future research could explore the potential links between unsafe firearm storage, sensation-seeking behavior, and stoicism to better understand the psychological underpinnings of these practices (Khazem et al., 2015). In other work, firearm-related variables, such as storing guns and ammunition separately or limiting public carrying, were identified as robust targets for intervention to reduce suicide risk (Dempsey et al., 2019).

Misperceptions About Suicide Risk

Simonetti and colleagues (2019) noted a misperception among veterans (n=3,949) regarding the connection between firearm access and suicide risk. In their work, the researchers found that 6% of veteran firearm owners agreed that having a firearm in the home increases suicide risk; this view mirrors similar perceptions among the general U.S. firearm-owning population (Simonetti et al., 2019). Despite this misperception, most veterans in the study (81.9%) indicated a willingness to limit firearm access if a household member was deemed to be suicidal. This willingness suggests that, while education on firearm safety and suicide risk is essential, many veterans are open to safety interventions that reduce access to lethal means, particularly if family members are involved (Simonetti et al., 2019).

The Role of Military Spouses and Families

Prevention campaigns tailored to military families should incorporate spousal dynamics and educate family members on firearm-safety protocols, including installation procedures (Betz et al., 2023). The Betz and colleagues (2023) study showed that in focus groups (n=56), military spouses had a limited understanding of the safe firearm-storage procedures suggested by military installations. Moreover, the following elements were associated with higher rates of safe firearm-storage practices: having children in the home, engaging in family discussions about firearm safety, and participating gun-safety training. These findings underscore the importance of leveraging family influences to encourage safe-storage practices among the more than 50% of firearm owners who currently do not store all firearms securely (Crifasi et al., 2018).

PTSD and Firearm Storage Practices

Exhibiting mental health challenges, like PTSD, and associated symptoms may also play a critical role in firearm-storage practices among Service members. Self-report research among U.S. Army National Guard personnel (n=327) found that elevated hyperarousal symptoms were associated with unsafe storage practices, such as keeping firearms loaded and/or in unsecured locations. Notably, this association persisted among those with deployment histories (Stanley & Anestis, 2021). Conversely, greater PTSD avoidance symptoms were linked to safer firearm-storage practices, such as securing firearms in a case or safe. These findings highlight the complexity of addressing firearm safety in

populations that have mental health challenges.

Messaging and In-Home Storage Practices

Service members who own firearms displayed a greater openness to adopting in-home firearm-storage practices for suicide prevention compared to using outside-the-home storage options. Furthermore, a comparative effectiveness study of active duty personnel (n=719) found that participants were likelier to adopt in-home safe firearm-storage methods when a trusted source (e.g., security forces) conveyed the information. This preference suggests that initial efforts should promote secure in-home storage and explore ways to make outside-the-home storage more acceptable (Anestis et al., 2022). In addition, messaging strategies matter significantly. Messages delivered by security forces and combat controllers yielded positive behavioral changes across various content options, while Service members were less likely to consider physicians as effective messengers (Anestis et al., 2022). These findings suggest that messaging is effective if delivered from a perceived trusted source.

Implications for Future Interventions

The findings in this report suggest that interventions that focus solely on individuals with identified self-harm risk factors are insufficient. Research indicated no significant differences in firearm-storage practices between veterans with and without such risk factors, which emphasizes the need for broader campaigns that target all firearm owners (Simonetti et al., 2019). Additionally, incorporating family members, particularly military spouses, into prevention efforts offers a valuable avenue for encouraging safe storage practices and mitigating suicide risks.

Military-connected families present challenges and opportunities for promoting firearm safety. While misperceptions about the risks associated with firearms persist, many veterans are willing to limit firearm access under specific circumstances, such as a family member within the household having suicidal ideation. Leveraging the influence of military spouses, tailoring messaging to Service members' preferences, and addressing mental health challenges like PTSD are key strategies for improving firearm safety. By taking a comprehensive approach that includes considering family dynamics, using targeted messaging, and initiating broader safety campaigns, interventions can be used to effectively reduce the risks associated with unsafe firearm storage and carrying practices in military-connected communities.

Suggestions for Further Research to Enhance This Field

Additional research is needed to expand the evidence base on firearm safety and to understand the impact of secure firearm-storage practices. Several directions for future studies have been proposed, including leveraging precision psychiatry approaches; examining storage practices for military-issued firearms; and investigating the links between unsafe storage practices and mental health outcomes, particularly in populations

at elevated risk.

Precision Psychiatry and Personalized Interventions

Future research could benefit from adopting a precision psychiatry approach. This method focuses on identifying subsets of firearm owners, such as Service members, who might particularly benefit from tailored interventions (Dempsey et al., 2019). Precision psychiatry leverages variability in individual internal and external factors (e.g., genetics, environment, lifestyle) to create personalized prevention and treatment strategies (Fernandes et al., 2017). By considering these individual differences, research could yield more targeted interventions that effectively address the unique needs of firearm owners in more specific populations.

Focus on Military-Issued Firearms

Another critical area for future research is more in-depth examination of storage practices for military-issued firearms. Although research exists on firearm ownership and safety practices in military populations, current studies predominantly focus on civilian firearm ownership, which may leave a gap in further understanding how Service members handle military-issued weapons. Addressing this gap could be beneficial as there are distinct regulations and cultural norms surrounding firearm use in military settings. Research in this area could illuminate whether existing storage practices align with safety recommendations and identify opportunities for targeted interventions in military communities (Stanley & Anestis, 2021).

Understanding Motivations for Firearm Ownership

In addition, future research could investigate the reasons behind firearm ownership, particularly in the context of defense-related purposes. Evidence suggests that owning firearms for self-defense is associated with higher rates of unsafe storage practices (e.g., leaving firearms loaded and unlocked) (Stanley & Anestis, 2021). Understanding the motivations for firearm ownership may inform the development of interventions that address these specific reasons and promote safer storage behaviors.

Mental Health and Suicide Prevention

Given the intersection of firearm safety and suicide prevention, future studies should explore how unsafe firearm-storage practices interact with mental health conditions such as post-traumatic stress disorder (PTSD). For example, researchers may wish to examine whether hyperarousal symptoms associated with PTSD, combined with unsafe storage practices, are longitudinally linked to suicide-related outcomes, such as suicide attempts and mortality (Stanley & Anestis, 2021). By understanding these connections, researchers may be able to develop interventions that target the interface between firearm safety and mental health to reduce suicide risk.

Longitudinal and Multidisciplinary Studies

Future research efforts should also consider including longitudinal designs that assess the long-term effects of firearm-safety interventions (Stanley & Anestis, 2021). Adopting a multidisciplinary approach and integrating perspectives from psychiatry, public health, and military studies could yield more comprehensive findings. These approaches could enable researchers to evaluate the sustained impact of interventions and their broader implications for public safety and mental health outcomes.

Advancing the evidence base for firearm-safety interventions will require a multifaceted research agenda. By adopting precision psychiatry, examining military firearm-storage practices, understanding the motivations behind firearm ownership, and exploring the relationship between mental health and unsafe storage practices, researchers can address critical gaps in the literature. These efforts, particularly when supported by longitudinal and multidisciplinary studies, have the potential to significantly enhance the effectiveness of firearm-safety strategies and their role in suicide prevention.

Conclusion

The evidence in this report highlights several effective strategies for decreasing the risks associated with unsecured firearm-storage practices in residences. Providing free safety devices, such as trigger locks or gun cabinets, has been shown to consistently improve storage practices by eliminating financial barriers and ensuring accessibility to the safety mechanisms. Similarly, community involvement, such as community-based interventions that distribute these tools and offer firearm-safety education, has encouraged safer firearm storage. These findings point to the possible benefit of combining barrier reduction (e.g., free gun locks) with localized community-based firearm-safety education to maximize the impact of firearm-safety programs (Rowhani-Rahbar et al., 2016; Simonetti et al., 2018).

Implementing tailored messaging and interventions that target specific populations, such as military-connected families, especially military spouses, can further enhance the effectiveness of these programs. Military spouses represent an underutilized resource in promoting safe storage practices and educating households about firearm-safety risks (Betz et al., 2023).

Future interventions could consider adopting a multifaceted approach that includes integrating free safety-device distribution, community-based initiatives, and tailored educational campaigns to address barriers to secure firearm storage. Engaging families, leveraging trusted messengers, and addressing underlying misperceptions about firearm risks are crucial strategies for developing and maintaining long-term success. By combining these elements, policymakers and organizations can create more effective, evidence-based programs to reduce the prevalence of unsafe firearm-storage practices and the associated risks to households and communities (Rowhani-Rahbar et al., 2016; Simonetti et al., 2019).

Further Reading

Research Review: ***Personal Firearm Storage in the United States***

- This report, part of RAND's Gun Policy in America initiative, highlights evidence-based safe storage practices and offers evaluation suggestions for future research.
- <https://www.rand.org/research/gun-policy/analysis/essays/personal-firearm-storage.html#fnb15>

Additional Assistance

The TA specialists at the Clearinghouse support professionals as they examine and make informed decisions about which programs fit specific situations and are worth the investment. Whether connecting one with the resources and tools to conduct a needs assessment in a particular community, suggesting the best evidence-based program or practice for a certain situation, or developing an evaluation plan, the TA team of experts is a call or email away.

Please visit our website at www.militaryfamilies.psu.edu or call 1-877-382-9185 to speak with a TA specialist.

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