Running Head: GLOBAL FIREARM VIOLENCE- AN INTEGRATIVE REVIEW

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Key Points:

- In 2021, the FBI dissolved a 90-year-old incident reporting system to create the new National Incident-Based Report.

Firearm violence in a national and international context: Policies, risk factors, and protective measures – an integrative review

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Research indicates that firearm violence is a significant global public health crisis, with impacts that extend far beyond the immediate physical harm to individuals. The United States has the highest firearm-related mortality among industrialized nations. Statistically, the U.S. experiences firearm mortality rates that are not only higher than those in countries with comparable levels of economic and institutional development but also like rates observed in nations undergoing significant humanitarian crises. Moreover, the comparison with countries facing humanitarian crises has broader implications of firearm violence as a barrier to sustainable development and public health. The proliferation of firearms exacerbates existing social and economic challenges, leading to cycles of violence that hinder recovery and development efforts. The similarity in firearm-related mortality rates suggests that, despite the vastly different contexts, the consequences of firearm violence on public health and social cohesion are universally detrimental.

OBJECTIVE: To identify established relationships between firearm policies, their risks, and protective factors, placing the United States within a global context of firearm violence.

METHOD: Integrative review considering selected PubMed, Lilacs, and Scielo studies. Inclusion criteria: firearm violence, articles from the past decade. Exclusion criteria: restricted to the human species. Procedure: Database search phases included: (a) a broad literature search regarding firearm violence using selected search terms and time frame; (b)

identifying global firearm policies, risk factors, and protective factors; and (c) identifying higher levels of Evidence-Based Practice (EBP) studies.

RESULTS: Thirty-four studies met the search criteria. Results indicated that within a global context, there is a disproportionately high rate of firearm violence in the United States. Several risk factors and protective factors were indicated. No empirical studies have yet established causation for firearm violence.

CONCLUSION: Restrictive firearm policies and other protective factors are a critical component in the reduction of firearm violence, which requires multi-pronged strategies that embrace policy, education, research, public health, cultural, and societal aspects. Further research is needed across all sectors related to firearm violence.

Keywords: Gun violence, firearm policies, firearm prevention, suicide, homicide, mass shootings

Firearm violence is a global public health crisis that inflicts substantial individual and societal trauma (American Psychological Association [APA], 2013; Centers for Disease Control and Prevention [CDC], 2017). It involves violence with firearms against oneself or others (Gun Violence Association [GVA], 2019). Key contributing factors include various risk and protective elements, with a history of violence being a strong predictor (APA, 2013; Wintemute et al., 2001). Research indicates that psychological issues often lead to suicide, a major form of firearm violence (APA, 2013; Schwab-Reese & Peek-Asa, 2019), while homicide is seldom linked to mental illness (APA, 2013; Sher et al., 2015). Effective interventions across legal, public health, public safety, and community programs can reduce gun violence (APA, 2013; Center for Gun Policy and Research [CGPR], 2015; Parioma, 2017; Siegel et al., 2019).

The APA (2013) recommends protective measures for the U.S., such as firearm prohibitions for high-risk groups like domestic violence offenders, violent crime perpetrators, and individuals with severe mental illness histories. They also advocate for (a) firearm purchaser licensing, (b) universal background checks for all sales, and (c) strict oversight of firearm retailers. Despite these recommendations, firearm violence in the United States remains significantly higher than in similarly developed countries, with 39,773 firearm-related deaths in 2017—a five-year high—highlighting the need for urgent public health and safety measures (CDC, 2019).

Firearm Violence Prevalence

In a global context of 197 countries, the United States ranks 11th in gun violence rates, the only high-income country in the top 20, with 21.2 firearm-related deaths per 100,000 people annually (Parioma, 2017). Its rates are comparable to those of low-income countries facing war or instability (Parioma, 2017). The FBI reports that active shooter incidents averaged 9.4 per year from 2000 to 2010, more than doubling to 19.1 from 2010 to 2018 (Blair & Schwieit, 2014; NTAC, 2019). In 2017, firearms were involved in 37% of US homicides and 60% of suicides. While global firearm-related deaths decreased by about 1% from 2009 to 2016 (Naghavi, 2018), the US saw a 16% increase in firearm deaths from 2014 to 2017 (CDC, 2018). Notably, the US, with less than 5% of the world's population, holds nearly 50% of civilian-owned firearms (Small et al. [SAS], 2018). In 2016, firearm injuries were the leading cause of death among children and adolescents in the US (CDC, 2017). Research on civilian gun violence categorizes firearm-related deaths as suicides, homicides, homicide-suicides, or mass shootings (APA, 2013; GVA, 2019), excluding those related to war or humanitarian crises.

Methods of Destruction

Suicide was the leading cause of civilian deaths in 2016, resulting in an estimated 67,500 deaths globally and a rate of 0.9 deaths per 100,000 persons due to firearms (Naghavi et al., 2018). Although firearm suicides constitute only 6% of all suicide attempts, they represent over 50% of firearm suicide deaths (GVA, 2018). Homicides account for about 64% of global firearm fatalities (Naghavi et al., 2018), with the U.S. homicide rate 25% higher than in similarly developed nations (CDC, 2019). The U.S. ranks among the top 20 countries for homicide rates, alongside nations facing severe instability like the Democratic Republic of Congo and Haiti (Institute for Health Metrics, 2018). Firearm deaths can also be classified as homicide-suicide, where the perpetrator first commits homicide and then takes their own life. A longitudinal study (2013-2016) across 42 U.S. states found that most homicide-suicides involve firearms (Schwab-Reese & Peek-Asa, 2019) and often occur in family settings, frequently involving intimate partner violence (Flynn et al., 2016; Salari & Sillito, 2016; Zeppegno et al., 2019). Mass shootings, defined as incidents with four or more victims (excluding the perpetrator), differ from homicide-suicides, occurring in public and involving strangers. Notably, children and adolescents are increasingly involved; from 2009 to 2019, the U.S. experienced 180 school shootings with 356 deaths, while Canada and France had two each and Germany one. Contributing factors may include lax firearm policies, as over 50% of mass shooters in the U.S. stockpile multiple guns compared to 22% in other countries (Lankford, 2015). Conflicting political responses in the U.S. include calls for stricter firearm control and increased civilian acquisition for self-defense (Stroebe et al., 2017; Studdert et al., 2017).

Firearm Policies

Research suggests that firearm policies play a significant role in mitigating firearm violence and vary widely across similarly developed countries. Some of the most common firearm policies worldwide include universal background checks, greater accountability for

licensed firearm dealers, higher safety training standards for firearm owners, improved reporting of records related to mental illness for background checks, firearm prohibitions for persons subject to domestic violence restraining orders, and implementation of firearm violence restraining orders (Barry et al., 2018).

Canada

Despite being labeled restrictive by Alpers (2018), Canada is a ‘shall-issue’ country, granting licenses if specific criteria are met, regardless of the applicant's reasons. Firearms are classified as non-restricted, restricted, or prohibited. Non-restricted firearms, mainly standard rifles and shotguns, require no registration unless the owner resides in Quebec (Statistics Canada, 2018). Most handguns and semi-automatic rifles are restricted and must be registered, while modified automatic firearms are prohibited. To purchase and possess firearms, individuals must complete the Canada Firearms Safety Course, apply for a firearm license, and pass a universal background check, with licenses renewed every five years. Canada provides relatively accessible firearms compared to the United States but has significantly lower gun violence. In 2017, Canada reported 775 firearm-related deaths, comprising 579 suicides, 179 homicides, 11 accidental deaths, and six with undetermined intent (Statistics Canada, 2018). Roughly 70% of these deaths were suicides, with White men aged 40-60 making up 30% of the total, mirroring trends in the United States (Statistics Canada, 2018).

European Union

In the EU, firearms regulation is classified as restrictive (Alpers, 2018). Montenegro has the highest per capita firearm ownership in the EU, but the U.S. has over three times that amount (SMA, 2018). The Firearms Directive, first implemented in 1991 and revised in 2008, categorized and restricted firearm ownership, mandated "good cause" for ownership, and required registration and traceability (European Commission, 2014). However, Duquet et al.

(2015) noted the challenge of obtaining accurate figures on legal and illegal gun ownership in the EU due to the lack of a central database for registered firearms.

United States

In the United States, firearm permit specifications vary significantly across the 50 states. While federal firearm laws have evolved, state-level policy implementation remains key (Wintemute, 2015). A notable liberal policy is open carry, allowing public rather than concealed firearm possession (Gifford Law Center [GLC], 2018b). As of 2018, thirty-one states and Yemen permit public open carry of handguns without a license. Additionally, thirty-three countries, including Honduras, Canada, and Switzerland, have "shall-issue" policies for personal protection permits (GLC, 2018a; 2018b; Santaella-Tenorio et al., 2016; 2017; Wintermute, 2015).

State regulations for firearm dealers differ on record-keeping, background checks, waiting periods, multiple sales reporting, and zoning ordinances (Alpers, 2018; Santaella-Tenorio et al., 2016; 2017). Other areas of policy include firearm and ammunition quality, penalties for offenders, and voluntary programs like firearm buybacks and Red Flag laws (Santaella-Tenorio et al., 2016; 2017; APA, 2013). Only five states prohibit handgun carry, while others require a license or permit for open and concealed carry (GLC, 2018b). Stricter gun laws are associated with lower gun-related death rates; a 2018 study found a 14% reduction in firearm suicides with enhanced Red Flag law enforcement (Kivisto & Phalen, 2018).

In 2018, GLC identified Hawaii, Massachusetts, and New York as states with the fewest gun-related deaths, while Alaska and Alabama had the highest (GLC, 2019). States with low gun deaths typically require dealer licenses, restrict assault weapons and large-capacity magazines, and mandate purchase permits and ownership registration. Connecticut

saw a 15% drop in firearm suicides after implementing a permit-to-purchase law, whereas Missouri experienced a 16% rise after its repeal (EGR, 2019).

Although evidence links looser gun laws to increased firearm deaths, no definitive studies confirm a causal relationship. Repping et al. (2019) noted a connection between permissive gun laws and higher mass shooting rates, suggesting increased gun ownership leads to greater exposure to firearms. Other research found no causal link between strict gun policies and lower death rates, especially regarding suicide (Center for Gun Policy and Research [CGPR], 2015).

Objectives

Our study aims to contribute to the national and international discussion on gun exposure and violence, placing the United States within an international context. An integrative review of gun violence literature was conducted to learn about gun policies and to identify risk factors and protective measures for gun violence prevention for the last decade, both locally and globally.

Method

The integrative review methodology, based on Souza, Michelly, and Carvalho (2010), encompassed both experimental and non-experimental studies to synthesize data from theoretical and empirical literature. It aimed to define concepts, evaluate theories, and analyze methodological issues, guided by questions about the rise of gun violence locally and globally. Our objective was to examine the literature from the past decade on (a) gun violence trends, (b) risk and protective factors, and (c) effective firearm ownership and control policies. Searches were restricted to articles in English, Portuguese, and Spanish or those translated into English.

Evidence-based practice (EBP) criteria classified studies as follows: Level 1 for meta-analyses of multiple randomized controlled trials; Level 2 for individual experimental

studies; Level 3 for quasi-experimental studies; Level 4 for descriptive or qualitative studies; Level 5 for case reports; and Level 6 for expert opinions (Souza et al., 2010).

We used PubMed/MEDLINE, Scielo, and LILACS databases, beginning with the keywords “gun” and “violence” to refine our search. The review focused on studies published between 2009 and 2019. A further search included “homicide,” “suicide,” “firearms,” “guns,” and “violence,” considering only studies with abstracts related to firearm violence involving humans.

The final search used keywords like “gun,” “violence,” “firearm,” “meta-analysis,” and “review” to identify more Level 1 and 2 research on gun violence per EBP criteria. Data collection and analysis adhered to integrative review standards set by Polit et al. (2004), Lo Biondo-Wood et al. (2001), and Ursi (2005).

Results

An initial PUBMED/MEDLINE literature search with no date restrictions and the keywords “gun” and “violence” identified 689 human-related articles. In contrast, Scielo yielded eight articles and Lilacs five. From January 2013 to August 2019, published articles on firearm violence surged by 12,400%, with 80% originating from the United States. A subsequent search using “gun,” “violence,” “meta-analysis,” and “review” yielded no additional studies. Ultimately, 34 articles met the inclusion criteria for this integrative review, comprising one study each from Italy, Australia, Kenya, Scandinavia, and Argentina, alongside 30 from the United States. Eight articles focused on children or adolescents, while no studies addressed elderly populations. All 34 studies examined firearm violence in adults.

Gun Violence Context

Articles were organized according to the context—areas included homicide, suicide, homicide-suicide, mass shootings, and VAW. Thirty-one articles mentioned either suicide or homicide, and three articles discussed gun violence in the context of homicide-suicide. Eight

articles mentioned VAW either in a domestic context or in general. All VAW references were associated with a homicide or a homicide-suicide perpetrated by a male. All authors considered VAW to be a severe public health problem correlated with increased domestic violence and homicide-suicide rates. Further, Carmichael et al. (2018) noted that 12.9% of North American homicide victims resulted from VAW in 2018.

Two articles discussed mass shootings, with both articles presenting a distinct entity, distinguishing them from homicides and suicides. Results indicated that mass shootings are highly related to passion or extreme religious principles or hate against minorities, other cultures, other religions, specific races, and genders (Chapman et al., 2016; Repping et al., 2019). All articles on firearm violence by homicide-suicide and mass shootings discussed restrictive gun policies in the context of decreasing rates of violence.

Category Analysis

EBP across 34 articles indicated two (level 1), four (level 2), four (level 3), three (level 4), 22 (level 5) articles, and no level 6 articles. Level 5 had the highest percentage of case reports (62.85%). Category analysis (gun control policies, mental illness, public health, and cultural aspects) and domains of risk factors and protective factors are discussed below. Additionally, Table 1 (risk factors) and Table 2 (protective factors) summarize selected findings across articles.

Firearm Policies

Across multiple studies, overly permissive firearm policies were identified as risk factors, correlating with higher rates of mass shootings, homicides, and suicides globally. Seven articles (20%) suggested that universal background checks during firearm purchases are linked to reduced homicide and suicide rates. Protective factors against gun violence included more restrictive policies, ongoing regulatory review, and adapting laws based on

health and safety needs, with consistent outcomes across countries at various developmental levels.

In the United States, descriptive, non-experimental studies emphasized that restrictive firearm policies are key to reducing firearm-related violence, while permissive policies are seen as risk factors. Restrictive policies also correlated with lower child suicide rates and fatalities across all age groups, although firearm violence rates among US Black males of all ages continued to rise.

Mental Illness and Public Health

Psychological and psychiatric factors were central in studies on suicide and homicide. Research on suicide underscored the protective effects of mental health treatment and firearm access restrictions for vulnerable groups. Homicide studies highlighted the public health costs of gun violence, linking mental health issues to higher firearm acquisition risks, which contribute to increased violence (APA, 2013; CDC, 2017).

Evidence-based practice (EBP) searches identified one study on the psychological impact of domestic violence involving firearms, noting the rising global rates of violence against women (VAW), especially among partners with firearm access (Sorenson & Schut, 2018). Abusers with guns are five times more likely to kill their victims, with an average of 52 women killed by intimate partners with firearms each month in the U.S. (ETR, 2019). Another study highlighted that homicide-suicide events, whether individual or mass shootings, adversely affect entire communities (Panczak et al., 2014).

Lower EBP studies emphasized the need for psychiatric screening in gun ownership assessments, as instability can lead to suicidal or homicidal behavior. Strong public mental health services were identified as critical protective factors for individuals contemplating suicide, while inadequate services were recognized as significant risk factors for global firearm violence and associated public health issues and mortality rates.

Cultural Aspects

Gun violence was considered a social problem in most studies. However, aside from race and ethnicity, cultural issues concerning firearm violence were not adequately addressed in the selected studies. Some research has posited that in the United States, gun ownership could be considered a cultural phenomenon (social gun culture) as study participants felt that gun ownership increased personal safety and was a fundamental right of US citizenship (Kalesan et al., 2016; Ramchand et al., 2018).

Risk Factors

Table 1 summarizes the risk factors identified in the selected studies. Global risk factors included high poverty rates, inadequate public health programs, mental illness, civilian gun ownership, ethnicity, insufficient gun control, civil unrest, elevated violence and crime, and corrupt police and governments. In the United States, risk factors included male gender, African American ethnicity, age, high poverty, firearm ownership and exposure, alcohol and substance abuse, violent relationships, mental illness, increased violence and crime, and inadequate firearm policies. Several studies highlighted illegal firearm use as a significant risk factor.

Protective Factors

Table 2 summarizes the protective factors indicated in the selected studies. Global protective factors included lower poverty rates, lower rates of violence, increased government stability, removal of illegal firearms from circulation, improved emergency health services, banning of semi automatic rifles and pump-action shotguns, and the existence of gun policies. In the United States, proposed protective factors included stricter overall firearm policies, buyback programs, lack of access to firearms, universal background checks, and lack of exposure to firearms.

Discussion

The studies indicate that risk factors for firearm violence, best practices, and related policies stem from a mix of political decisions and interactions at individual, family, and community levels. The articles address key issues like gun policies, public health, cultural factors, and risk and protective elements linked to firearm violence. Recent literature highlights the growing need for more research on firearm violence nationally and globally, particularly concerning specific high-risk populations in the US and worldwide. This review identifies significant research implications and limitations.

Research Implications

In the past decade, studies on global firearm violence have surged, yet none have established causation, underscoring the need for rigorous research. This review shows that the US has a disproportionate number of suicides, homicides, and mass shootings compared to similarly developed countries, with 80% of studies focusing on the US. Among the articles reviewed, 63% were case reports, reflecting rising firearm violence rates. Male demographics, especially Black males and women facing domestic violence, are disproportionately affected, though further research is needed to understand the broader societal impact. The review also highlights a lack of studies on the psychological and psychiatric effects of firearm violence, despite misconceptions linking perpetrators to mental health issues. Clarifying the relationship between mental health and firearm violence is crucial, as stigma can impede treatment and lead to incorrect causation attributions. Moreover, firearm violence is linked to increased individual, collective, generational, and secondary trauma (Kalayjian & Eugene, 2010).

Limitations

The findings in this report are subject to limitations related to available data from a limited number of global geographic regions. The meta-analyses and other higher-level EPB studies reviewed in the selected data were limited to specific areas; no articles considered

global data across all existing countries. Finally, the selected data might need to be more complete for empirical and non-empirical studies, considering areas where data-sharing relationships still need to be fully developed.

Conclusion

This integrative review highlights the urgent global health crisis of firearm violence affecting individuals, families, and communities. The literature identifies various risk and protective factors related to firearm policies. Protective factors include gun buy-back programs, universal background checks, public health initiatives, and ongoing research. Key risk factors involve exposure to firearms, high ownership rates, substance abuse, mental health issues, insecure environments, social and political instability, and inadequate public health services. Depending on their nature, firearm policies can either mitigate or exacerbate risk, with permissive regulations increasing vulnerability. Further research is essential to establish causal links between these factors and firearm violence rates.

Government policies and public funding should prioritize public safety, health programs, and educational interventions regarding firearm exposure and violence. Unregulated access to firearms particularly endangers marginalized communities, as seen by the disproportionate impact on young Black men in the U.S. Additionally, unregulated access correlates with increased violence against women, a pressing global concern.

Currently, no studies have definitively established causative links regarding global firearm violence rates. Thus, more investigation into firearm policies and their relationship with violence is crucial for effective prevention strategies. Given the limited existing research, further studies should explore the benefits of stricter firearm policies across diverse populations while considering cultural influences. Lastly, research should also emphasize comprehensive violence prevention support, including emotional management, socio-cultural factors, and accessible mental health services.

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Table 1
Protective Factors

Study	**Country**	**Protective Factors**
Akhiwu & Igbe (2013)	Nigeria	Improve security, reduce poverty, remove illegal firearms from circulation, and improve emergency health services.
Baumann et al., (2017)	US	Buyback programs.
Branas, Han & Wiebe (2016)	US	Policies regarding alcohol abuse and firearms.
Carmichael et al. (2018)	US	Increased recognition of patterns of intimate partner violence.
CDC (2013)	US	Future research is needed regarding patterns of firearm suicides and homicides.
Chapman, Alpers &, Jones (2016)	Australia	Gun law reform, including a ban on semiautomatic rifles and pump-action shotguns and implementation of a firearm buyback program.
Cook A, et al., (2017)	US	Instigation of federally funded research is needed to develop effective intervention programs.
Fleegler et al. (2013)	US	Increased restrictive gun policies
Fowler et al. (2015)	US	Future research is needed.
Frei et al. (2011)	US	Suicide reduction through limiting access to firearms is needed; domestic homicide measures are needed to focus on the integration and education of the perpetrators and their families.
Galta, Olsen & Wik (2010)	Scandinavia	More research is needed.
Gentile G, et al., (2013)	Italy	Review the criteria considered for the issue of firearms licenses.
Karch DL, et al., (2012)	US	Increased monitoring of firearm-related fatal injuries and assist public health authorities in the development, implementation, and evaluation of programs and policies related to firearm violence.
Karch, Dahlberg & Patel (2018)	US	Increased monitoring of firearm-related fatal injuries and assist public health authorities in the development, implementation, and evaluation of programs and policies related to firearm violence.

Kegler, Dahlberg & Mercy (2018)	US	Early prevention efforts are needed regarding firearm exposure in youth, such as efforts to strengthen household financial security, stabilize housing, teach youth coping and problem-solving skills, identify and support persons at risk, and implement proactive prevention policies in schools, workplaces, and other organizational settings to reduce suicide risk and related problems such as substance abuse, depression, and social isolation.
Lawson (2015)	US	Premature mortality reduction efforts should focus on violence prevention and conflict mitigation.
Martin et al. (2010).	US	More studies are needed.
Ramchand et al. (2018)	US	Address sequelae from social violence; reduce the risk of suicide conferred by gun access.
Resnick et at. (2017)	US	More restrictive firearm legislation, more research, increased protective legislation.
Rowhani-Rahbar, Simonetti & Rivara (2016)	US	Encourage increased gun storage through counseling augmented by device provision.
Sen & Panjamapirom (2012)	US	Background checks include checking for restraining orders, mental illness, and criminal behavior.
Sorenson & Schut (2018)	US	Increased study of policies and prevention, including an expanded focus on an intimate partner's nonfatal use of a gun.

Table 2
Risk Factors

Study	**Country**	**Risk Factors**
Akhiwu & Igbe (2013)	Nigeria	Lack of security, high poverty rates, lack of control over illegal firearms, lack of emergency health services.
Anglemyer, H. & Rutherford (2014)	US	Having a firearm at home.
Branas, Han & Wiebe (2016)	US	Alcohol abuse and firearm exposure.

Carmichael et al. (2018)	US	Substance use and social conflict.
Cook A, et al., (2017)	US	Racial/ethnic minority populations.
Fowler et al. (2015)	US	Male gender, racial/ethnic minorities, and youth.
Frei et al. (2011)	US	Poverty, poor educational background, racial/ethnic minority neighborhoods, having a relationship with a violent person, and gun exposure.
Galta, Olsen & Wik (2010)	Scandinavia	Psychiatric instability.
Griffin et al. (2018)	US	Firearm prevalence rate and high violent crime rates.
Grinshteyn & Hemenway (2016)	Global	Living in the United States.
Karch DL, et al., (2012)	US	Age < 55 years; male gender; racial/ethnic minority populations; relationship problems; interpersonal conflict; mental health problems; and recent crises.
Karch, Dahlberg & Patel (2018)	US	Age < 55 years; male gender; racial/ethnic minority populations; relationship problems; interpersonal conflict; mental health problems; and recent personal crises.
Lawson (2015)	US	African American age15-45 and firearm exposure.
Martin et al. (2010)	US	Suicide: male gender, White, ≤ 35 years. Homicide: male gender; Indigenous, Black, Hispanic, ≤ 24 years.
Panczak et al. (2014)	Global	Canada, The Netherlands, England, and Wales: level of civilian gun ownership in the country.
Parks et al. (2014).	US	Homicide and suicide: male gender, <55 years, and specific minority populations, relationship problems, interpersonal conflicts, mental health problems, and recent personal crises.
Pear et al. (2018).	US	Non-Hispanic black men had the highest rate of firearm homicide, but Hispanic men had the highest number of deaths in California, US.
Reeping et al. (2019)	US	Permissive gun laws and higher rates of gun ownership.
Sorenson & Schut (2018)	US	Having a violent intimate partner and gun exposure.

Tuan &Frey (2017)	Wisconsin	Homicide: Black, male gender, age 18 – 34.
Wintemute (2015)	US	Focused interventions