

Systematic Review

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Is the Run, Hide, Fight Concept Effective in Improving Hospital Response to Shooting Incidents? A Systematic Review

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Abstract

The recent rise of active shootings calls for adequate preparation. Currently, the “Run, Hide, Fight” concept is widely accepted and adopted by many hospitals nationwide. Unfortunately, the appropriateness of this concept in hospitals is uncertain due to lack of data. To understand the “Run, Hide, Fight” concept application in hospitals, a review of currently available data is needed. A systematic review was done focusing on the “Run, Hide, Fight” concept using multiple databases from the past 12 years. The PRISMA flow diagram was used to systematically select the articles based on specific inclusion and exclusion criteria. The measurements were subjective evaluations and survival probabilities post-concept. One agent-based modeling study suggested a high survival probability in non-medical settings. However, there is a paucity of data supporting its effectiveness and applicability in hospitals. Literature suggests a better suitable concept, the “Secure, Preserve, Fight” concept, as a response protocol to active shootings in hospitals. The effectiveness of the “Run, Hide, Fight” concept in hospitals is questionable. The “Secure, Preserve, Fight” concept was found to be designed more specifically for hospitals and closes the gaps on the flaws in the “Run, Hide, Fight” concept.

On average, 38,000 people are killed and 85,000 people are injured by firearms each year.¹ Although active shootings mainly occur in business and educational settings, hospitals are not exempt from this tragedy.² Between the years 2000 and 2011, a total of 154 hospital-related shootings were identified and occurred 59% of the time within the hospital.³ Within the hospital, the most vulnerable location is the Emergency Department (ED) with 45 (29%) incidents, followed by inpatient rooms (19%).^{3–5} Thus far, the most common motivation that active shootings happen is from perpetrators having grievances toward hospital staff.^{5,6}

Hospitals are considered soft targets and thus highly concerning for hospitals and their patients.⁷ Soft targets are defined as “places with a high concentration of people, and a low level of security against violent attacks.”⁸ Active shootings cause physical, psychological, and emotional harm for health-care workers, patients, and visitors.^{9,10} Hospitals, especially the ED, have open public access which renders the location vulnerable, increasing the risks and rate of violence in these settings over the years, which has proven traumatizing to both physicians and other staff.¹¹ The vulnerability of the hospital’s location and specific population group made active shootings in health-care settings a public health concern.

In the setting of increasing incidence of active shootings and terrorist attacks in the United States, the Department of Homeland Security has encouraged the public to adopt the “Run, Hide, Fight” concept.¹² Similarly, with active shootings’ nature as low frequency but high-stake events in health-care facilities, the Federal Bureau of Investigation (FBI), the Joint Commission, and the Emergency Nurses Association recommended hospitals to have emergency action plans such as the “Run, Hide, Fight” concept.⁸ In “Run, Hide, Fight” concept, participants are advised to first flee from the scene; if not possible, then find somewhere safe to hide; if both running and hiding are not feasible, then fight the perpetrator.^{13,14} This concept has appeared effective in helping civilians survive active shootings in nonmedical settings where casualties were limited during the shooting on a train from Amsterdam to Paris in 2015 because a few victims swarmed a gunman.¹⁵

Unfortunately, there is not much research on the effectiveness of this concept when used in hospitals. The aim of this study is to review quantitative and qualitative analyses done on the “Run, Hide, Fight” concept and describe applicability for health-care settings.

Methods

Study Chronology

In October 2022, the study commenced with conducting a literature review for gun violence in the United States health-care settings through PubMed, EMBase, and Google Scholar databases. The key search terms were “guns,” “hospital policy,” “run, hide, fight,” and “emergency department.” All literature searches were restricted to the publishing year from 2010 to 2022 and English language only. Articles were chosen based on its content, focusing on hospital concepts for appropriate prevention and response to active shooting incidents. Many articles were also chosen from the reference list of each initial article. Despite a few concepts proposed and used for effective hospital response to active shootings over a decade, the “Run, Hide, and Fight” concept was 1 of the most common strategies adopted and used by many institutions, such as hospitals, schools, and office sites.¹³ Thus, the literature search was narrowed down to a key term of “Run, Hide, Fight” as the concept of focus for this review. The literature review ended in November 2022.

Samples

With a narrowed literature search focusing on the “Run, Hide, and Fight” concept, the PRISMA flow diagram was used to systematically select the articles (Figure 1). The selection was based on specific inclusion and exclusion criteria. The inclusion criteria for this study were concept implementation in health-care facilities only, implementation at United States hospitals, and use of quantitative and/or qualitative analyses of the concept. The only exclusion criterion was concept adoption in nonmedical settings, such as schools, workplaces, or houses of worship.

Data Analysis

This is a systematic review with the unit of analysis being the “Run, Hide, and Fight” concept. The variables for analysis were quantitative measurement of this concept’s effectiveness and major public feedback of this concept: (1) its applicability to health-care settings, (2) its rates of implementation, and (3) people’s psychological preparedness for this concept.

Results

Quantitative Measurement of Effectiveness

A study done on this concept’s effectiveness through agent-based modeling showed both pros and cons of the “Run, Hide, Fight” concept. The study performed multiple “Run, Hide, and Fight” simulations.¹⁶ The survival probability for all-run scenarios is 92.1% if victim agents focus solely on running away from the shooter.¹⁶ The survival probability for all-hide scenarios is 5.16% if victim agents focus solely on hiding and remaining hidden for the entire duration of the active shooting event.¹⁶ The survival probability for all-fight scenarios is 97.6% if victim agents decided to face and fight the shooter.¹⁶ To conclude, the findings of this study suggested victims to either run or fight the perpetrator because those will result in better survival. However, to note, this study was a simulated scenario and not in health-care settings which makes its applicability to hospitals and patients limited due to the vastly different environment and medical limitations.

Hospital Setting Applicability

Are we supposed to run? What about our patients? Do I just leave them to die? What about my own life? Any clinical staff would have such dilemmas when it comes to active shooting response, raising concerns on the applicability of the “Run, Hide, Fight” concept for hospital use. In 1 study, Inaba *et al.*¹⁷ claimed that the main rationale behind this is that health-care settings are full of ill individuals with some who are bedbound, unconscious, or relying on life-sustaining equipment. For these patients, the “Run, Hide, Fight” concept would be impossible. Furthermore, Inaba *et al.*¹⁸ brought up the ethical dilemma of this concept while exploring nurses’ perspectives in adopting it for a new active shooting concept in hospitals.

Rates of Implementation

The best measurement of effectiveness of any variable is through implementation. Without applying the variable, it is impossible to obtain data for analysis and evaluation if that variable works or not. A study by Darais¹¹ demonstrated that, although 84% of staff were aware of the location of the concept’s details, less than 50% of employees identified the “Run, Hide, Fight” concept as a correct response option, were aware of the concept’s details, and felt adequately trained for using the concept. The above data suggest inadequate usage of the “Run, Hide, Fight” concept due to lack of the concept’s recognition. Thus, frequent simulation training and drills are fundamental for the effectiveness of this concept by promoting its recognition and execution when actual active shooting occurs.

Psychological Wiring and Preparedness

Due to the “Run, Hide, Fight” concept, there is an increasing number of people with a false sense of security.¹³ This stems from the fact that the “Run, Hide, Fight” concept may only be applicable and effective for a specific group of individuals who, due to their life experience or brain chemistry, are able to recognize and respond to emergency situations more appropriately and efficiently. The field of survival psychology identified 3 phenomena after observing countless disasters and examining how people respond to life-threatening situations.¹³ These 3 phenomena are referred to as “incredulity response,” “normalcy bias,” and “confirmation bias.”¹³ The central theme of these phenomena is that people tend to ignore or minimize new circumstances or perceptions when these do not fit with their normal life experiences.¹³ Thus, they have problems recognizing crises because their brains are making them believe that everything will be fine.¹³ This explains why some respond to emergencies by freezing, mind blanking, or not responding to urgent situations.

Only a small proportion of individuals with personality traits and psychological wiring through training and life experience are mentally well-equipped for processing and responding to crises effectively and efficiently. These individuals have a prepared mind that gives them clarity in a situation with less brain power required to make decisions and respond.¹³ However, to achieve this mentality level, they need to have confidence, open-mindedness, and flexibility.¹³ ED staff are used to facing the unknown and typically have hardwired adaptational skills. However, ED personnel are not exempted from frequent training because active shootings are still rare events. Hence, this psychological wiring may not be possible for everyone, even for those who may be well-

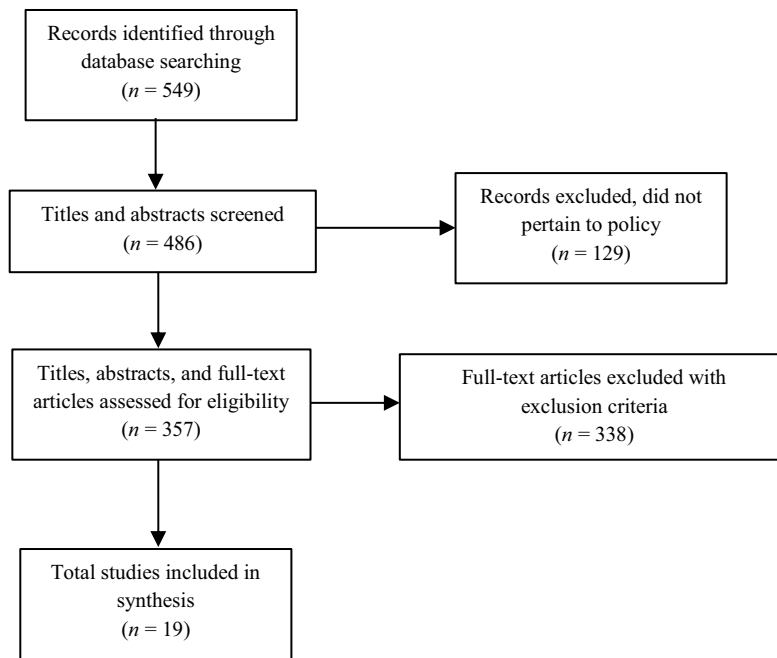


Figure 1. PRISMA flow diagram for literature review and systematic article selection on the “Run, Hide, Fight” concept in health-care facilities.

equipped due to the nature of their job, which may limit the efficacy of the “Run, Hide, Fight” concept in hospitals.

Finding Alternative Concepts

An acknowledgement that health-care facilities are filled with both healthy and sick individuals who are either bedbound or unconscious with life-sustaining equipment for survival is necessary to address when discussing active shooter in the hospital setting.¹⁹ A response is needed for this vulnerable population to be protected from harm. A concept called “Secure, Preserve, and Fight” has been cited as more appropriate for health-care settings, due to its applicability in protecting patients who cannot escape.¹⁷ Its goal is to first secure the area with self and patients who cannot escape through blocking every possible access point to the ward; dimming or turning off all non-essential lights; and silencing all telephones and pagers and other alarming devices.¹⁷ Other groups have suggested that it may be beneficial for hospitals to construct barricaded doors for entrances to each ward, in case of facing emergencies like active shootings.²⁰ After securing the area, preserving the patients’ lives is the next priority where they should be moved away from doors and windows to a sheltered area, if possible, and provide only essential medical care to sustain their lives.¹⁷ If all else fails, health-care workers, and anyone who is capable of fighting, even visitors, should be prepared for combat in case of encountering the perpetrator, to try to overwhelm the shooter and protect both their and the patients’ lives.¹⁷ However, despite the concept’s theoretical suitability to hospital settings, there are no data currently to support its actual effectiveness for both hospital and other public settings. This is the same for many concepts proposed by many entities and countries to counter active shooting and minimize casualties such as the “Run, Hide, Tell” concept used in the United Kingdom and the “Avoid, Deny, Defense” concept used by Ohio authorities since 2015.²¹ What makes active shooting tragic is not only its high casualty outcome,

but also the fact that there is no certain effective active shooting response concept for use to prevent the outcome.

Discussion

It is evident that the “Run, Hide, Fight” concept is effective in responding to active shootings in non-medical settings. For instance, during the active shooting in the bowling alley in Lewiston, Maine, 1 witness reported that “Between the lanes there’s some swinging doors where they keep all the mechanical stuff out back, so we kind of all just ran that way. We barricaded in there and another parent was in the room with me. She had a phone, she called 911.”¹⁸ Another witness reported that “[I] thought it was a balloon. I had my back turned to the door. As soon as I turned and saw that it was not a balloon, he was holding a weapon. I just booked it down the lane and I slid basically into where the pins are and climbed up to the machine and was on top of the machines for approximately 10 min until the cops got there.”¹⁸ “Hide” was necessary in this case because there was barely any exit route at the time for a “Run.”¹⁸ However, this study identifies a crucial gap in addressing the effectiveness of the “Run, Hide, Fight” concept in hospitals. There are limited data on the overall effectiveness of the “Run, Hide, Fight” concept, and all the current data are not targeted to hospitals. It has never been shown to be applicable to hospital scenarios and does not address major gaps given that hospitals are filled with individuals who may be disabled, bedbound, or unconscious without the ability to flee or fight.²² The “Run, Hide, Fight” concept seems to be effective in hospitals only if that population matches with the population affected by active shooting in other public settings. To demonstrate, toward the end of June 2023, there was an active shooting at Fraser Canyon hospital in British Columbia, Canada. A witness there at the time reported that “All of a sudden I heard gunfire start from the emergency room, and then I panicked and I ran.”²³ It was a normal, regular day for anyone where the witness went to the hospital’s

emergency room for persistent cough when she heard gunfire sounds while sitting in the waiting area. Afraid that the perpetrator might come out to the waiting room area, she ran out to the parking lot where she parked her car until police secured the scene.²³ From the incident in Maine and in this case, the concept seems effective in both scenarios because they can ambulate and care for themselves. However, not everyone situated in the hospital has that ability.

The “Secure, Preserve, Fight” concept as a response protocol for active shootings in health-care facilities is an alternative approach to address the flaws that come with the “Run, Hide, Fight” concept.¹⁷ The rationale behind this recommendation is that the “Secure, Preserve, Fight” concept prioritizes securing the area as the first step.¹⁷ Thus, this approach protects both healthy individuals and ill patients who are unable to escape due to their physical condition and addresses the ethical dilemma that health-care professionals may face. Unfortunately, this appears applicable in theory only. At this time, there are no reliable and accurate data to support the effectiveness of the “Secure, Preserve, Fight” concept when used in hospital settings. Furthermore, while patient safety is a priority for health-care professionals, personal safety is paramount.²⁴ Health-care workers may still face ethical dilemmas of choosing between remaining with and protecting their patients who cannot escape or prioritizing their own safety in such a terrifying situation.¹⁷

While emphasizing the duty and codes of ethics of health-care professionals in placing patients first which, at times, involves accepting risks to themselves for patient care, there needs to be an emphasis on the fact that these codes do recognize that this duty is not absolute.²⁴ It is not shameful to consider self-protection in this horrifying situation. Similar to facing epidemic and pandemic situations, it is not wrong to be scared of the unknown with life-threatening potential. Health-care professionals should be allowed to accept significant, but not disproportionate, risks when performing their role.²⁴ Thus, once again, like epidemic and pandemic situations, health-care institutions should be involved in ensuring not only the patient’s safety, but also their employee’s safety.²⁴ This includes implementing both administrative and engineering measures for active shootings such as frequent simulation training and bullet-proof windows and glass walls.

The implementation rate and effectiveness of the “Run, Hide, Fight” concept is heavily reliant on frequency of training and preparedness for actual events.²⁵ To demonstrate, 1 study showed that 92% of 204 hospital staff who participated in simulations felt more prepared for responding to active shootings as well as reported 70% improvement in knowledge retention and application.²² The above data suggest simulation training and drills as fundamental for the effectiveness of this concept, especially ones with a multidisciplinary approach to help address all potential barriers as viewed by different disciplines.^{25,26}

As a result, an established official program is needed for the hospital setting by starting during the onboarding process and with an annual refresher course.¹¹ Darais¹¹ reported that 52% of hospital employees agreed that virtual training is most helpful. Also, 47.8% of hospital employees claimed full scale exercises and live training to be the most helpful, while 46% suggested classroom/verbal training, and 30.5% selected written training.¹¹ Simulation is suggested by many studies to be effective in improving the skills and mental preparedness of health-care workers for active shootings.¹¹ Once the official training and refresher courses are initiated, it is crucial to set up frequent simulation training sessions just as there are frequent mock codes done in the ED and ICU

settings. Repetition will aid in further promoting psychological preparedness and improving skills for response. The goal of training is to help hospital staff to be better psychologically wired and mentally prepared for responding to active shootings within the hospital.

For engineering measures, it is best to model countermeasures that are used by more common active shooting target locations, such as schools. A study by Zhu *et al.* (2022)²⁷ recommended the implementation of enhanced building security in a virtual school setting. The security countermeasures include installing barriers in areas surrounding the building, isolating unsecured areas from secured ones, increasing security access, using frosted windows, and staggering interior doors.²⁷ The study suggested that these countermeasures promoted hiding behavior as opposed to running behavior.²⁷ This may be beneficial not only for schools but also for health-care facilities because the population in both settings are not as equipped to run as the general population. Thus, hiding strategies in tightly secured areas of the building are likely to work better for school and hospital settings.

In addition to that, an agent-based simulation model by Bott *et al.* (2022)²⁸ showed that the presence of school resource officers and concealed carry weapon holders helps significantly reduce casualty rates during active shootings. Recently, there is a discussion if citizens, including employees during their work hours, should start carrying firearms for self-defense. This discussion took place after many active shooting events including the 2012 shooting at Sandy Hook Elementary School in Newton, Connecticut.²⁹ Although it sounds like a good proposal to fight a gunman with a gun, there may be more safety risks and complications than benefits. First, it takes intensive training for firearm use, and following this recommendation means that people will have more exposure to firearms where it can then turn into a potential weapon of harm at any point in time. Second, there will be an increased rate of injuries from firearm accidents because of malfunction or negligence such as in the firearm locking mechanism. Last, this would prove to be a disadvantage during active shooting due to the challenge for authorities to differentiate between perpetrators and victims who may have firearms for self-defense. Furthermore, perpetrators can then use this opportunity to pretend to be a citizen with a firearm and slip away from the crime scene. As a result, I personally do not believe that this suggestion is suitable for helping solve this problem.

Currently, there is a lack of adequate quantity of reliable data on both the “Run, Hide, Fight” and “Secure, Preserve, Fight” concepts for objective comparison on which concept is more suitable and effective for hospitals. This is especially true for the “Secure, Preserve, Fight” concept because it is a recently developed concept. Both concepts may not be effective in hospitals at all and a new proposed concept is needed. Also, there needs to be further discussion on personal safety if the “Secure, Preserve, Fight” concept is deemed more applicable for health-care settings.³⁰ Workplace violence in health-care facilities is on the rise. Health-care professionals should not be responsible in accepting disproportionate risks to benefit patient’s safety and care.³⁰ Thus, the future step identified from this study is to increase the number of valid and reliable research in this topic. In this case, randomized control trials would be impossible due to the nature of the event, but simulation study would be feasible. Then, future studies should consider a balance between health-care staff safety and the safety of patients and their families and visitors because there will be questions such as “if protecting our patients is a legal obligation?” and “if yes, are our lives less important?”

Conclusions

Active shootings can occur anywhere, including in hospitals. Hospital-based events have physical, psychological, and emotional impacts on health-care staff, patients, and visitors. Thus, an adequate response strategy is needed. The “Run, Hide, Fight” concept is currently most hospitals’ approach, but it has never been shown to be effective or applicable to hospital settings. The alternative, the “Secure, Preserve, Fight” concept is a potential approach to active shooting events in a hospital setting. However, both concepts lack adequate reliable data to make a definitive recommendation, and both concepts may not be effective at all in hospital settings, so a new proposed concept may be needed. Furthermore, evaluation of training type and frequency is needed to help hospitals create staff education. A strategy investigation is recommended to help hospitals across the nation better prepare for such incidences.

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