

## ENA Abstract

Effectiveness of High Fidelity Simulation to Bleeding Control Course with proper tourniquet placement amongst school personnel

### **Purpose:**

50 mass shooting incidents occurred in 2016-2017 in 21 states resulting in 221 casualties and 743 injuries (FBI 2018). Bystanders are first on the scene of incidents, making training civilians necessary to decrease morbidity and mortality from hemorrhagic injuries (“Stop the Bleed” 2018). Amongst the mass casualty incidents from 2000-2013, 24% occurred in public schools (FBI 2014). The purpose of our project is to measure the efficacy of adding a high fidelity simulation to a ACS B-Con Course. Secondary objectives: (a) evaluate the efficacy of retention of skills over a period of time; and (b) evaluate the change in length of time to tourniquet placement with the addition of a stressful simulated scenario.

### **Design:**

A prospective randomized clinical trial of participants from a local school district, invited to participate in a 2.5-hour curriculum from January 2019 to August 2019. Participation in the program is voluntary, participants can withdraw at any time. This will be assessed by evaluation of properly applying tourniquets and packing traumatic wounds and retention of these skills over a period of time.

### **Setting:**

292 acute bed hospital for in and out-patient services located in suburbs 20 miles from the city.

### **Participants/Subjects:**

From January -June 2019, participants attended one of six sessions that were held at the hospital simulation lab. Participants were randomized into 2 study arms using a “random generator.” The purpose of the study was explained to the two groups (B-Con only versus high fidelity). Inclusion criteria is anyone over the age of 18. Exclusion criteria anyone who had prior hemorrhage control training. All instructors are registered instructors for the ACS Bleeding Control (B-Con) course.

### **Methods:**

A questionnaire survey was given to all participants consisting of 8 questions: demographics, experience in our study material and comfort with the material and tasks. A rubric was used to evaluate participants on situational awareness and tourniquet placement. Each group was randomized into low or high fidelity scenarios receiving the same STB course.

### **Results/ Outcomes:**

Results were obtained; higher successful tourniquet application scores (90.3% vs. 71.0%, Odds ratio for experimental group = 7.9,  $p=0.025$ ) higher wound packing scores (59.7% vs.47.1%, odds ratio for experimental group= 33 percent points,  $p=0.007$ ), Improved comfort in a emergency scenario( $p=<0.001$ ) and comfort wound packing ( $p<0.05$ ). Participants in the experimental group are 11.97 times as likely as the control group to use a tourniquet in an emergency scenario according to self reports ( $p<0.01$ ). However, nonsignificant increase in proper tourniquet application and wound packing scores at retention 2-8 months after initial testing ( $p=0.2$  and  $p=0.8$  respectively).

### **Implications:**

Simulated environment provided a realistic and stress inducing scenario, engaging learners in a safe environment. Participants displayed improved procedural skills as interventions allowed for customized learning through tailored instructor feedback and conscious self improvement through biofeedback practice. Retention is a recurring issue in numerous life safety courses. Further exploration should include mobile cognitive aids that can be deployed in an emergency scenario. Next steps will be working with school districts to provide recertification courses and increase active shooter drills with stop the bleed principles.

### **References:**

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