Increasing Survival Of Healthcare Personnel During An Active Shooter Attack: Establishing Face Validity of an interactive simulation training as best teaching modality (PILOT STUDY)

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Background

Given the increased incidence of terrorist attacks worldwide the Department of Homeland Security considers healthcare facilities as “soft” targets.

Nationwide campaigns to increase awareness on the “Run, Hide, or Fight” strategies are currently in place in many medical facilities by local and federal law enforcement departments but are limited to a classroom type lecture followed by a Q&A session without an actual hand-on component.

We propose the use of a dedicated cognitive and kinetic simulation exercise to increase awareness, preparedness and ultimately a modification of behaviors that are more likely to increase survival in healthcare related attacks.

Methods

Our current pilot is the initial step to a larger face validation study that will consist of forty healthcare workers’ volunteers from University of Minnesota.

In this pilot, subjects (N=9) were randomly selected and grouped into two groups [Control N=4 vs. Experimental N=5].

The Control Group underwent a lecture and Q&A session. The Experimental Group was exposed to a “hybrid” cognitive and kinetic simulation material that included:

1. Virtual reality education component
2. A simulation component
3. Debriefing session by law enforcement component

Each group’s cognitive load was assessed using the Task Load Index (NASA TLX) questionnaire, followed by a 5-point Likert Scale questionnaire, and a educational assessment.

Results

- Median scores of 4 or higher were seen in all responses in the Likert scale questionnaire.
- Questions related to the need and usefulness of this type of training within the healthcare community scored 4.
- Questions related to the use of “hybrid” teaching modality to improve learning of basic survival concepts scored 5 in the experimental group.

Knowledge Test showed similar results in both groups.

Rater (Police Officer): Experimental group showed greater engagement and proper action toward survival mode and higher success of survival than control.

NASA Task Load Index showed that the experimental group reflected a higher level cognitive load overall as shown by the weighted rating (Graph 1A). Graph 1B displayed higher on the Mental, Physical, Temporal and Effort dimensions and lower on the frustration and performance dimension compared to the control group.

Conclusions

Given the limitations of this small pilot study, preliminary results showed an overall agreement on the needed and usefulness for this type of training within the healthcare community. Also, there was a higher tendency towards a better learning experience and audience engagement on the tasks.

NASA Task Load Index showed a higher workload experience in the experimental group. The usual understanding of this tool is that at a higher work load index, concentration tends to decrease, resulting in errors by the operator. Contrary to this understanding, our pilot study showed that in the experimental group 5 out of 6 dimensions assessed correlated with the expected normal physiology of a fight or flight response. These results also correlated with the higher survival likelihood assessed by the rater check list. The lower frustration and performance index for the group could indicate that the group felt more confident or better prepared.

It is too early to draw any conclusion and a larger study is needed, but we can infer from these preliminary results that the NASA TLX tool used in this manner may help validate the level of realism experienced by the trainee.

We hope to bring awareness to the medical community of the need to remain vigilant and the value that simulation adds to the likelihood of surviving during a active shooting crisis.

References
