

Learn, Experience, Reflect:

A Pilot for Tourniquet Application Error Recovery Training using a Tablet-Based Application.

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Introduction

Compared to traditional education frameworks, error recovery training prepares learners to recognize error cues and provide strategies to mitigate negative impacts. We employed the Learn, Experience, Reflect framework for designing error recovery training for tourniquet use, in which participants learn common errors, practice recognizing and fixing them, and receive feedback using a mobile application.

Methods

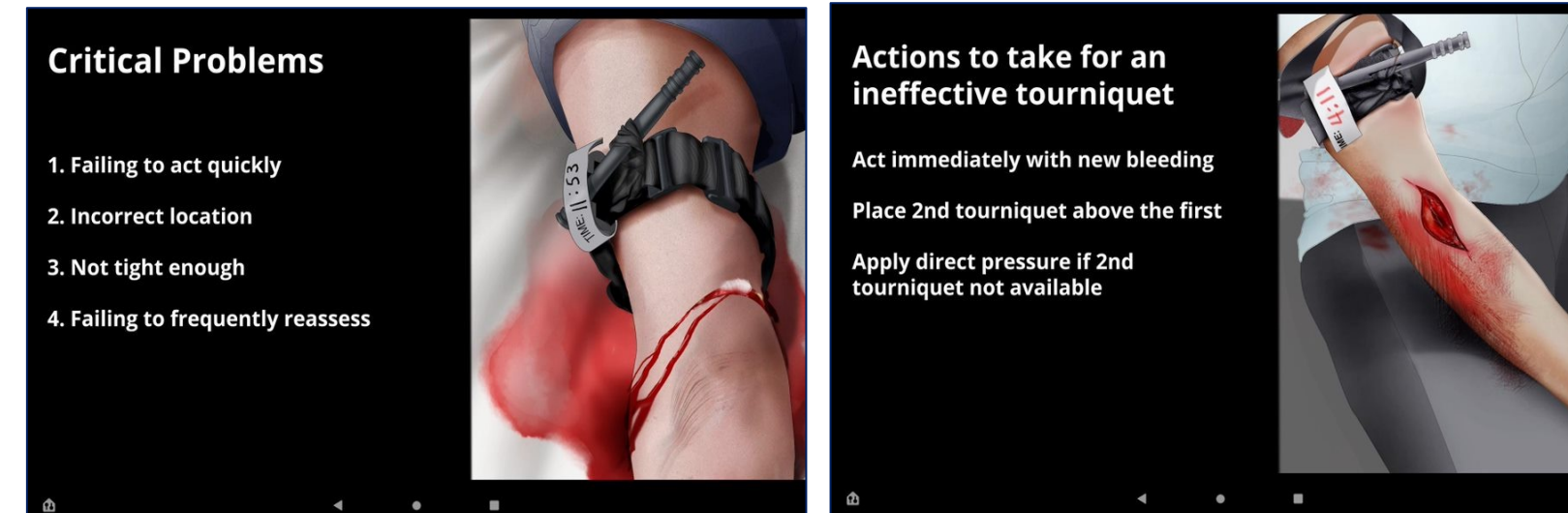
The content of the training app fell into three categories.

- Learn – video describing four common tourniquet errors and restoration strategies. The four errors are failing to act quickly, loose tourniquet, incorrect placement, and failing to continuously monitor the tourniquet.
- Experience – flashcards and a graphic novel in which learners practice recognizing tourniquet errors in context of short scenarios and choosing an appropriate action from a provided list.
- Reflect – questions for learners that probe their knowledge and provide immediate feedback and expert rationale.

We developed multiple-choice, situation judgment, and flashcard tests to assess knowledge. We administered the tests to EMT students and EMT instructors to validate that the tests discriminated between skill level. Based on scores, some app content was removed or revised. The remaining items were deemed challenging but appropriate by subject matter experts.

Training effectiveness will be evaluated by administering the three tests and a practical demonstration to 40 EMTs following the EMT course and again 8 weeks later. Twenty participants will complete the training; 20 will not.

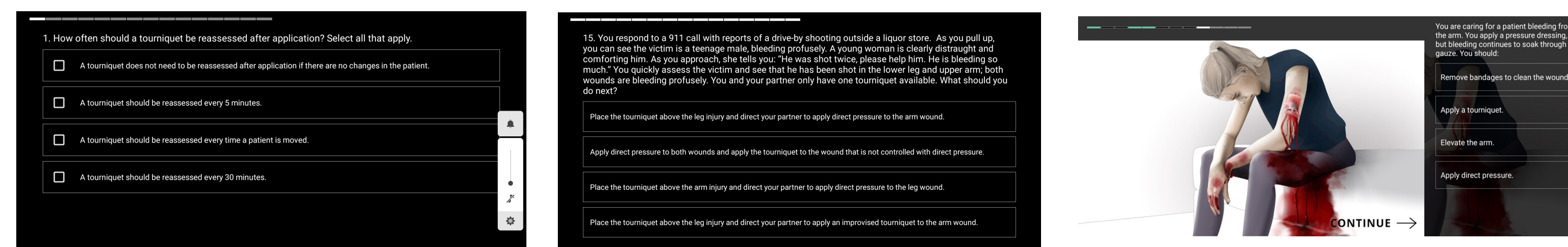
Learn Didactic Video



Experience Flash Cards & Graphic Novel



Reflect Knowledge Test & Situational Judgment Test



Results

Data collection is ongoing, but initial Time 1 results indicate the participants who received the training performed:

- more accurately on the knowledge test (mean score 11.36 vs. 8.86)
- faster on the knowledge test (114 vs. 235 sec.)
- more accurately on the test flashcards (mean score 13.50 vs. 11.25)
- faster on the test flashcards (196 vs 338 sec.)
- more accurately on the SJT (mean score 2.24 vs. 1.67)

There is no difference between groups on the practical demonstration.

Participants who received the training reported:

- The application was engaging (100% agree)
- The exercise and examples in the App were realistic and true-to-life (82% agree, 12% neutral)
- The value of the training offered in the App was worth the time it took to complete (100% agree)
- After completing the App, I am better prepared to fix an ineffective TQ on the job (100% agree)

Full results are expected by October 2023.

Discussion

Initial Time 1 data indicates that the Learn, Experience, Reflect framework is useful for designing effective app-based error recovery training for tourniquet use. Time 2 results will determine whether the error recovery training improves retention of tourniquet errors and mitigation strategies over time.

The author team would like to thank the participants who completed their initial EMT training and agreed to participate in the research.