

Pilot Evaluation of Smartphone Technology for Injection Training.

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Background: The importance of adrenaline auto-injector (AAI) training is well established but, as reported in the literature, training can be delayed or incomplete and there may be an inadequate system of continuous practice such that patients and caregivers fail in the use of AAIs. Assistive technologies in the form of mobile phone apps have demonstrated potential across a range of healthcare disciplines. However, assistive technology for anaphylaxis is, as yet, underdeveloped and not evaluated.

Objective: Pilot laboratory experimentation to investigate Smartphone technology for AAI practice.

Methods: Twenty-two healthy adult participants were briefed on anaphylaxis and EpiPen(R) AAI use and then randomly assigned into practice groups; a control group provided with printed manufacturer instructions and a technology group provided with a Smartphone app with video demonstration and visual step by step guide. Participants used their allocated practice material with an AAI trainer before demonstrating use and completing a Technology Acceptance Questionnaire. Correct injections required each of the steps (removal of the cap, swing and jab motion to the thigh, holding in place for 10 seconds, massaging for 10 seconds) to be completed correctly.

Results: More people in the technology group (63.6%) completed all the steps of the injection in comparison to the people in the control group (18.2%) [$X^2=4.701, p<0.05$]. The technology group (81.8%) performed significantly more correct the 'swing and jab' step than the control group (45.5%) ($X^2=3.143, p<0.05$). The technology acceptance questionnaire results showed that the technology group reported more usefulness of their practice material than the control group ($U=7.5, p<0.05$), increased ease of use ($U=10, p<0.05$) and increased willingness toward future use ($t(20)=5.661, p<0.05$). The debrief interview feedback from technology participants suggested the visual, real-time demonstrations provided an opportunity for modelling the correct technique.

Conclusions: The results suggest that Smartphone technology could help improve AAI practise. Further work, funded by the Anaphylaxis Campaign UK, is underway to assess an AllergiSense app that provides sensed practise feedback.