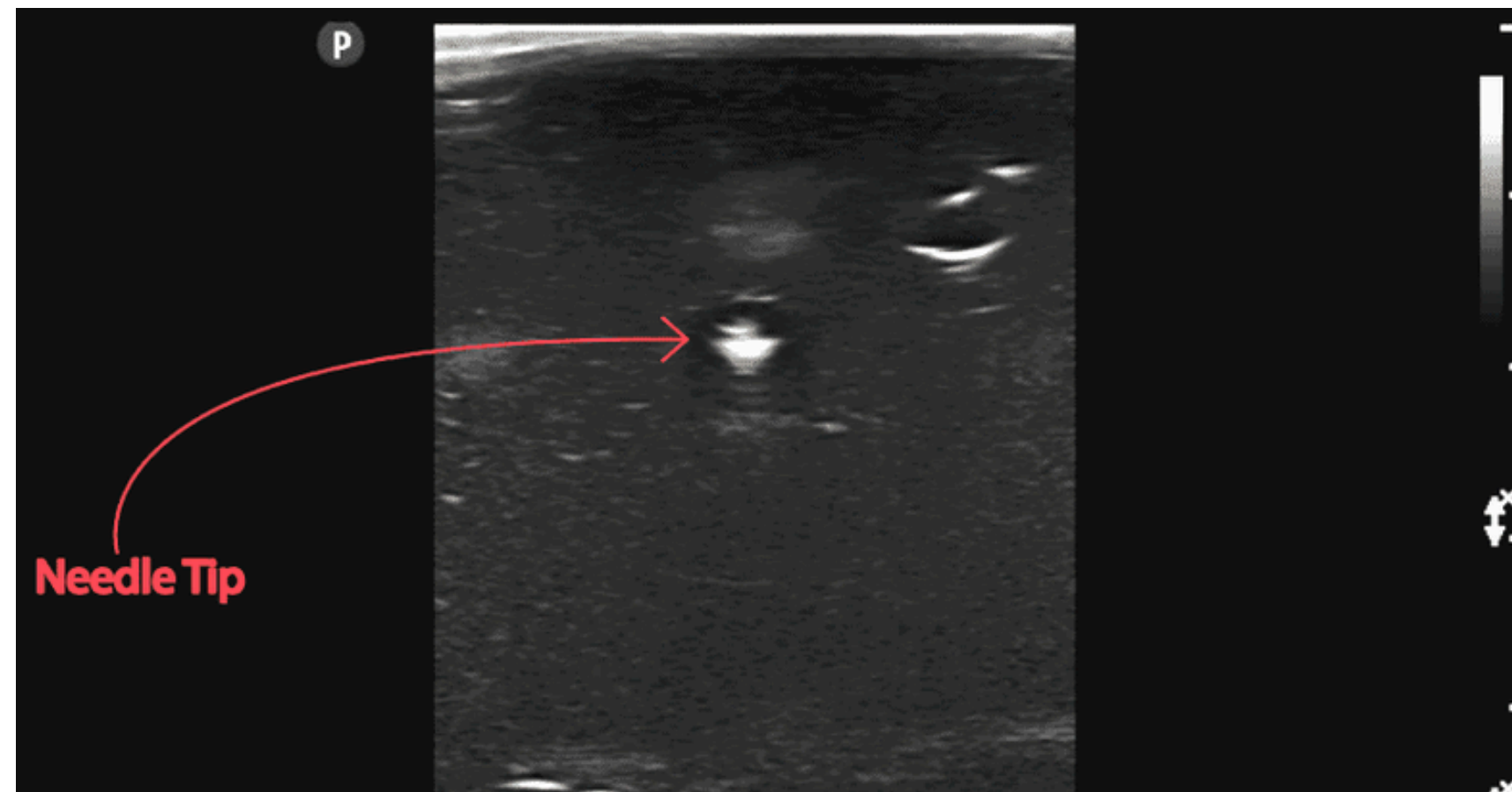


Video Games are Good for You: Video Game Experience and Skill Acquisition for Ultrasound-guided Intravenous Catheter Placement

Stephanie Midgley, MD, Brendan Liakos, Shahrukh Syed MD, Joseph Felice, MD, Bradley Nolan, Pandya, Deep, MS
Department of Emergency Medicine, Vassar Brothers Medical Center, Poughkeepsie, NY

OBJECTIVE

The objective of this study was to investigate the influence of video game experience on the speed and accuracy of learning ultrasound-guided peripheral intravenous (USpIV) catheter placement.



INTRO

Video games correlate with enhanced procedural medicine skills possibly due to the more developed motor and visual pathways of video gamers. In emergency medicine, ultrasound-guided peripheral intravenous (USpIV) catheter placement is one of the most common visual-spatial procedures but also one of the most difficult to master. Here, we investigated the impact of video game experience on the speed, skill, and accuracy of learning USpIV.

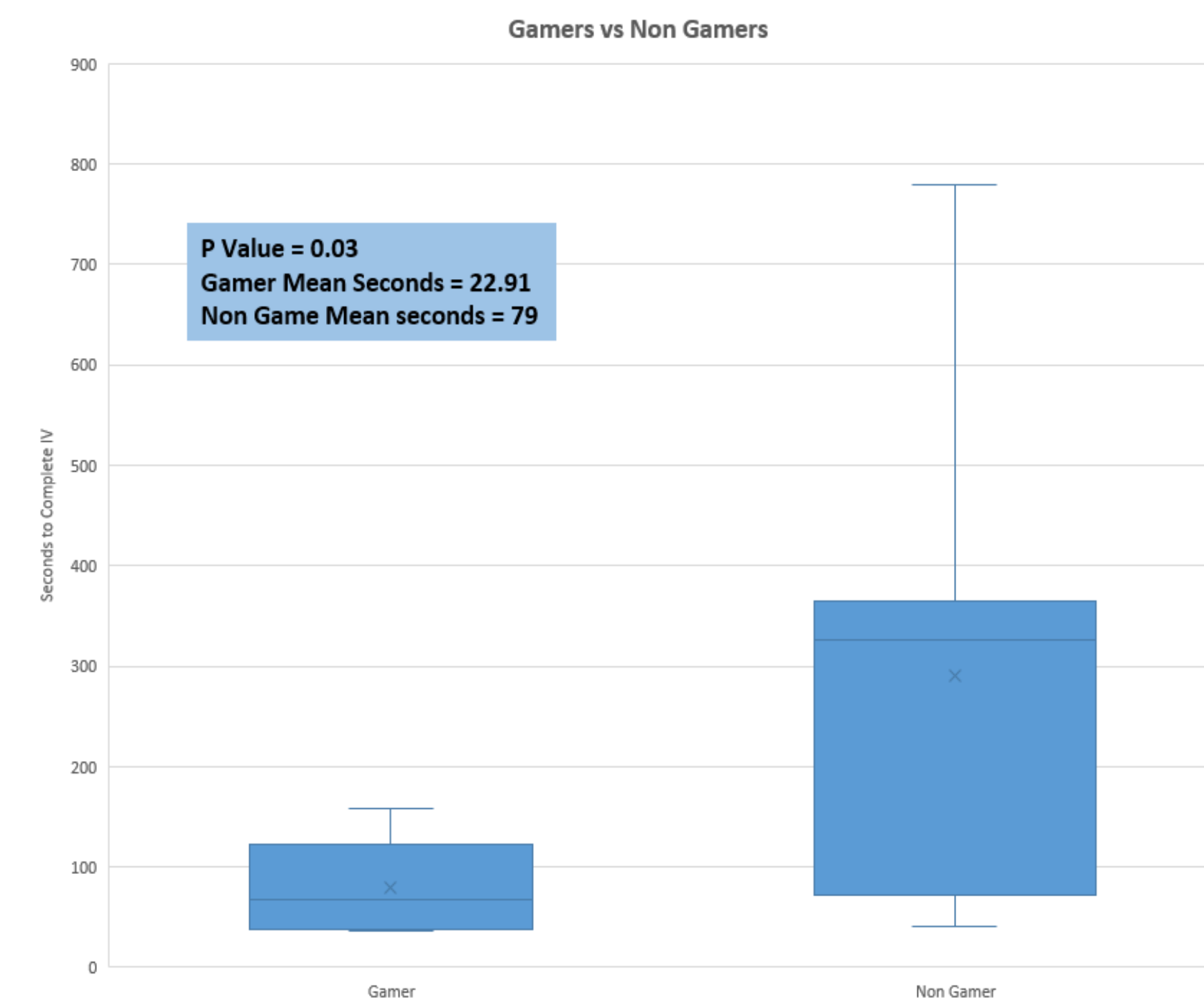
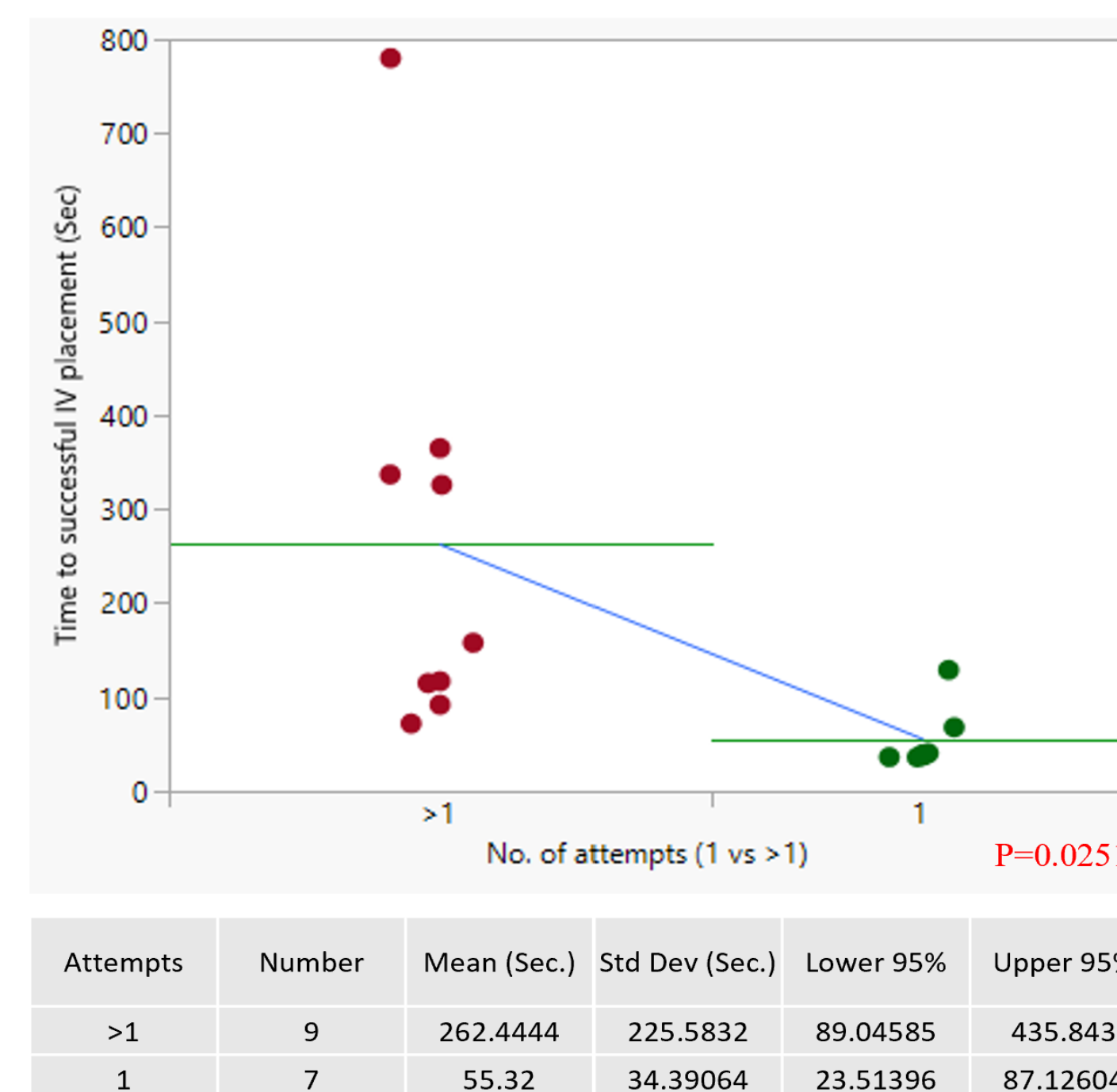
METHODS

This prospective observational study included medical trainees and residents (n=16), who performed less than 50 USs and 5 USpIV. Participants' video game usage was surveyed. Survey scoring were given based on video game experience (non-gamers, intermediate gamers, serious gamers). Once the survey was completed, participants underwent a 15 minute lecture followed by demonstration and hands on training sessions for USpIV using CAE Ultrasound IV simulators with a Philips Lumify linear transducer. Once proficient on the CAE simulator with a 100% success rate for 5 attempts, they were then timed on a chicken breast with latex tubing simulator. Participants used 22g angiocatheters; time began once the angiocatheter pierced the chicken skin and continued until placement was successful with the number of attempts recorded.

Successful IV placement was when colored water was aspirated through the angiocatheter; failures prompted repeated attempts with new catheters and sites until success.

Outcome Measures were based on total attempts and time to successful placement (TTSIV) on meat simulator. All correlation and statistical analyses were performed using R and JMP Pro.

RESULTS



Participants who required more than one attempt had significantly longer time to successful placement compared to those who succeeded on their first attempt.

Importantly, a significant association was found between gaming experience and time to successful USpIV, with non-gamers demonstrating longer times compared to gamers. Specifically, participants with no gaming experience exhibited the longest time, highlighting a potential correlation between gaming background and procedural efficiency in USpIV.

CONCLUSIONS

Analysis indicated that age and gender did not exert significant effects on the time to successful USpIV (TTSIV).

A significant difference (p=0.02, t-test) was observed between the number of attempts (1 vs. >1) and TTSIV (group mean 262 vs. 55 sec.).

Furthermore, a comparison between non-gamers and gamers (intermediate and serious) for their TTSIV revealed statistical significance (p=0.03, Wilcoxon), with TTSIV being longer for non-gamers compared to gamers (group mean 291 vs. 79 sec.).

LIMITATIONS

It is crucial to interpret these findings cautiously due to the limited number of participants and the high standard deviation in TTSIV. Notably, participants with no gaming experience and non-gamers exhibited the longest TTSIV (385 seconds) underscoring a potential association between gaming background and procedural efficiency in USpIV.

Additionally, we did not assess for other tasks that can develop hand-eye coordination, such as musical training, which may have affected our results.