

Confidence-Competence Mismatch and Reasons for Failure of Non-Medical Tourniquet Users.

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Abstract

OBJECTIVE: Tourniquet application is a lifesaving skill taught worldwide in first aid bleeding control courses. We observed performance among non-medical users of tourniquets in their confidence, competence, and reasons for failure.

METHODS: 179 Israeli military recruits without prior medical training underwent their standard first aid course where they learned Combat Application Tourniquet (CAT; Composite Resources, Rock Hill, SC, USA) use. After course completion, they self-reported confidence in tourniquet use. User performance was assessed 7-14 days later using a HapMed™ mannequin that assessed time, pressure, and blood loss. Competent performance required in aggregate: 1) use with pressure of 200 mmHg or more, 2) hemorrhage volume of less than 638 mL, and 3) correct placement of the tourniquet. For failed performance, a reason for failure was reported independently by both the user and an expert observer.

RESULTS: 45 of 179 user performances (25%) were competent. Users who reported high confidence had only a slightly higher chance of achieving competence in tourniquet application ($r = 0.17$, $p = 0.022$). The most common reason for failure was excess slack in the CAT's strap (experts 55%, users 39%), and too few turns of the windlass (23% and 31%, respectively) was the second most common reason. Expert and user evaluations had poor agreement ($\kappa = 0.44$, 95% CI 0.32-0.56).

CONCLUSION: The most common reason for failed use of tourniquets among non-medical users was excess slack in the tourniquet strap. Users self-evaluated their performance inaccurately and demonstrated a confidence-competence mismatch. These pitfalls in performance may help tourniquet instructors improve training of caregivers.

KEYWORDS: caregivers; education; emergency medical services; first aid; hemorrhage; prevention and control; tactical; tourniquet

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