

# Implementing & Evaluating Prehospital Trauma Training Program During the Ukraine-Russia War

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## Introduction

- The 2022 Russian invasion increased trauma related injuries and deaths throughout Ukraine.
- It destabilized the prehospital care workforce leading to an immediate need for trauma education and training among first responders due to the rapidly rising trauma volume and strained prehospital resources.
- In response, an academic-non-governmental organizational partnership formed to develop, and deliver, in-person prehospital training courses throughout Ukraine.

## Objective

- Our objective was to assess the impact of needs-based training on first responder knowledge and confidence in managing trauma patients during a humanitarian crisis.

## Methods

- A Prehospital Traumas Fundamentals (PHTF) was developed, translated into Ukrainian, and taught in seven Ukrainian oblasts between August 2022 and December 2023.
- PHTF is a 16hr course containing lectures, skills stations, and simulations, developed using needs assessments and international training standards.
- Knowledge change and confidence levels were assessed via pre- and post- course testing and self-assessments.
- Post-course follow-up surveys evaluated course impact. Data were analyzed in RStudio using McNemar’s test for paired data and Wilcoxon matched-pairs signed-rank test.
- This project was determined to not require Institutional Review Board approval by the Mass General Brigham Office of Human Research Affairs.

## Host Organization & Funding

- The Ukraine Trauma Care Response Program is an academic and non-governmental organizational partnership between Harvard Humanitarian Initiative (HHI) & International Medical Corps (IMC). HHI, through its Emergency Health Systems Program, is leading a consortium consisting of Mass General Brigham, Global Medical Knowledge Alliance, and Boston Children’s Hospital.
- Grant Funding was provided by International Medical Corps.

Figure 1: Map of Course Sites



Table 2: Participant Self-Confidence Assessment Score Changes

| n=455  | Pre-course  | Post-course | Sig*     |
|--|-------------|-------------|----------|
| Participant agree or strongly agree on Likert Scale  |             |             |          |
| <i>I feel comfortable handling patients requiring trauma care</i>                                | 68.4% (311) | 80.9% (368) | <0.0001  |
| <i>I feel nervous about seeing patients with traumatic injuries</i>                              | 65.1% (296) | 58.5% (266) | P=0.0116 |
| <i>I feel that I lack the skills to provide care in most emergencies</i>                         | 78.5% (357) | 40.4% (184) | <0.0001  |
| <i>I feel prepared to see patients with life threatening injuries</i>                            | 42.6% (194) | 70.5% (321) | <0.0001  |
| <i>I feel that I understand the XABCDE of emergency care</i>                                     | 65.1% (296) | 96.0% (437) | <0.0001  |
| <i>I feel I have organized approach that allows me to be prepared to are for trauma patients</i> | 55.6% (253) | 89.5% (407) | <0.0001  |
| <i>I do not feel confident in my knowledge of trauma care</i>                                    | 58.5% (266) | 27.5% (125) | <0.0001  |
| Participants feeling confident or very confident on Likert Scale                                 |             |             |          |
| <i>Emergency management of the injured adult</i>   | 45.3% (206) | 80.9% (368) | <0.0001  |
| <i>Emergency management of the injured child</i>   | 19.6% (89)  | 49.9% (227) | <0.0001  |
| <i>Emergency management of blast injuries</i>  | 28.8% (131) | 65.7% (299) | <0.0001  |
| <i>Emergency management of penetrating injuries</i>  | 38.9% (177) | 76.0% (346) | <0.0001  |
| <i>Emergency management of blunt trauma</i>  | 41.1% (187) | 76.0% (346) | <0.0001  |
| <i>Emergency management of the patient with shock</i>  | 33.8% (154) | 62.9% (286) | <0.0001  |
| <i>Emergency management of the patient with altered mental status</i>                            | 26.8% (122) | 51.6% (235) | <0.0001  |
| <i>Emergency management of the patient with difficulty breathing</i>                             | 37.1% (169) | 77.1% (351) | <0.0001  |
| <i>Have the skills to manage an obstructed airway</i>  | 34.2% (156) | 74.1% (377) | <0.0001  |
| <i>Have the skills to manage hemorrhage</i>  | 56.4% (243) | 82.4% (375) | <0.0001  |
| <i>Have the skills to immobilize injured patients</i>  | 43.5% (198) | 80.0% (364) | <0.0001  |

\*Based on McNemar’s test for paired data

Table 1: Participant Demographics

|                         | n(%)        |
|-------------------------|-------------|
| Gender                  |             |
| Male                    | 230 (28.0)  |
| Female                  | 586 (71.5)  |
| Other/prefer not to say |             |
| Missing                 | 4 (0.5)     |
| Age (yrs) [IQR]         | 37.5[26,48] |
| Clinical Background     |             |
| Physician               | 207(25.2)   |
| Nurse                   | 385(47.0)   |
| Paramedic               | 31(3.8)     |
| Flecher                 | 0(0.0)      |
| Pharmacist              | 0(0.0)      |
| Non-healthcare worker   | 138(16.8)   |
| Other                   | 59(7.2)     |

Table 3: 6-week Follow-up Survey

|   | n=186 |
|---|-------|
| Do you feel this training has had (or will have) a life-saving effect in your management of a trauma patient? | 99.5% |
| I learned knew knowledge about trauma   | 81.2% |
| I learned new procedures applicable to my practice  | 75.3% |
| I now feel more confident to care for a trauma patient  | 72.6% |
| This training changed my management of a trauma patient   | 44.6% |
| I taught others how to perform procedures learned in this course  | 60.8% |
| I have taught others trauma management knowledge learned in this course                                       | 61.8% |
| I have performed a new skill learned in the course  | 73.1% |
| I have used equipment that I previously didn’t know how to use  | 16.5% |

## Results

- 820 participants completed PHTF and were predominantly female (71.6%), median age was 37.5yrs[IQR26-48].
- 93.6% of participants had knowledge assessment scores increase; scores improved from 53.9%[SD13.5%] to 77.0%[SD14.2%](p< 0.05).
- Self-confidence surveys demonstrated improved preparedness managing life-threatening conditions(42.6%v70.5%,p< 0.0001), and confidence managing shock(33.8%v62.9%,p<0.0001), penetrations(38.9%v76.0%,p<0.0001), blunt trauma(41.1%v76.0%,p<0.0001), and external hemorrhage(53.4%v82.4%,p<0.0001).
- Participants identified decreases in sense of skill deficit(78.5%v40.4%,p<0.001), nervousness managing injured patients(65.1%v58.5%,p<0.05), and lack of confidence(58.5%v27.5%,p<0.0001).
- Of the 186(22.7%) who completed the follow-up survey; 99.5% stated the training has or will have a life-saving effect on their patient management, and 75.3% implemented new skills in their practice.
- Most used (73.1%) or taught (60.8%) course skills to another clinician.

## Conclusions

- PHTF participant knowledge and confidence improved.
- Participants applied information taught on war-injured patients, which suggests information taught in educational programs delivered just before or during large-scale events can be retained and used to change patient care.
- Lessons learned from developing and delivering PHTF serve as a starting point for delivering just-in-time first responder education in other humanitarian crises or disasters.

## Limitations & Next Steps

- This study was completed using a novel trauma education taught only in Ukraine
- Resource & Cultural Constraints:** Limited resources, & language and cultural barriers, may have affected the scalability and effectiveness of the training.
- Geopolitical & Evaluation Challenges:** Ongoing conflict and a short evaluation period pose uncertainties regarding the program's long-term impact and consistent delivery.