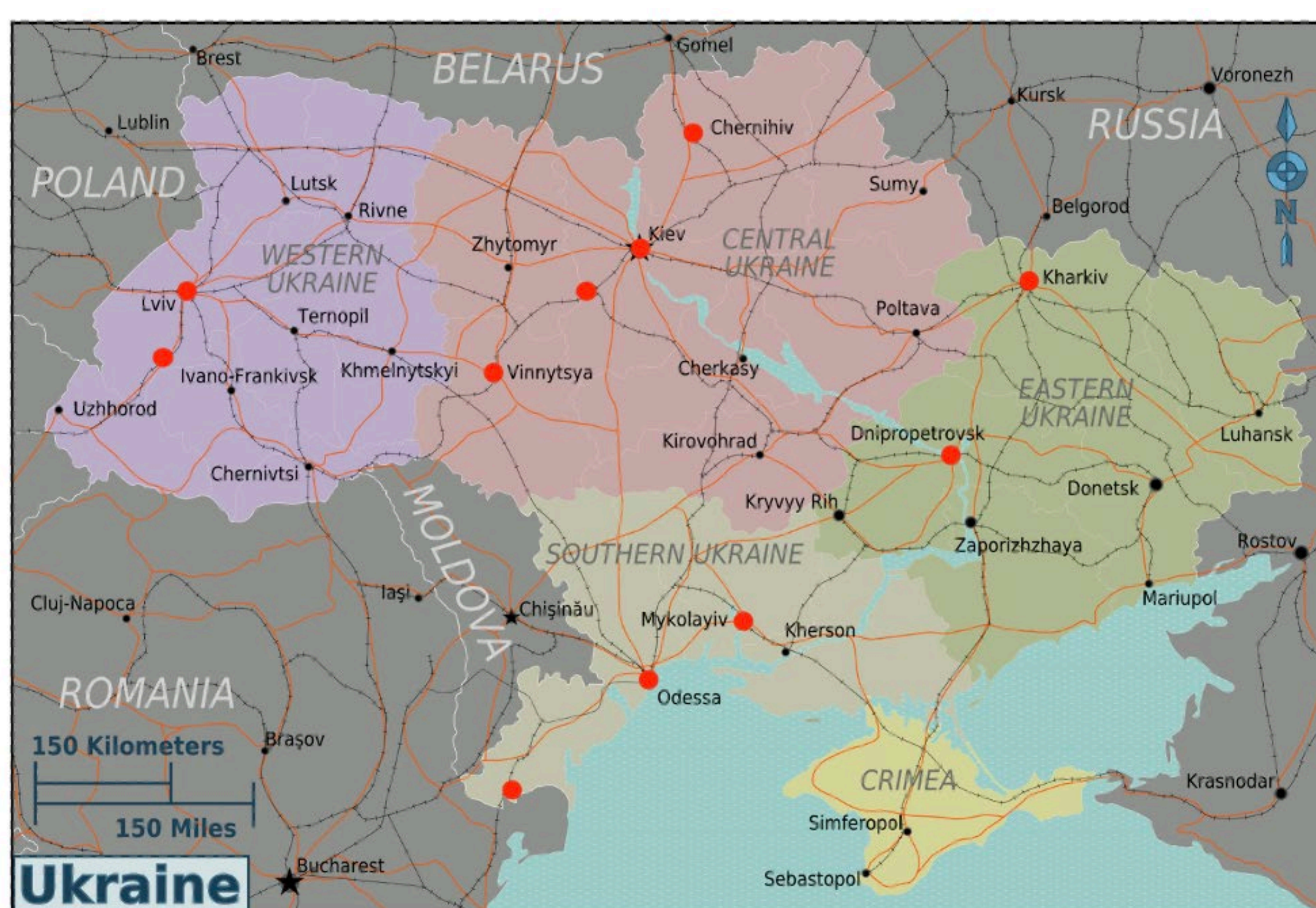


Locally-led paediatric trauma training in Ukraine was possible and scalable even during conflict

Expanding Trauma Education During War: Paediatric Trauma Fundamentals Training in Ukraine

Background: The escalation of armed conflict in Ukraine has led to a surge in paediatric trauma cases and disrupted medical and nursing education. In response, a novel 2-day Paediatric Trauma Fundamentals (PTF) course was developed by academic and humanitarian partners to strengthen paediatric trauma care capacity across Ukraine. The study evaluated the implementation and outcomes of the PTF course delivered during active conflict.

Map of Implementation Locations in Ukraine



Prioritizing the Front Lines. A two-day PTF course was developed and delivered across 30 training sessions in 11 Ukrainian cities from November 2022 to December 2023.

Teaching Methods



Teaching Methods. The curriculum was co-developed by local stakeholders, adapted to the conflict context, and taught through lectures, simulation, and skill stations.

Methods & Additional Results

A three-phase implementation model was used: 1) international led courses, 2) training-of-trainers (ToT), and 3) Ukrainian led courses. Pre/post-tests assessed knowledge and self-efficacy, with statistical analysis using paired t-tests and McNemar's test. Follow up surveys assessed application of new knowledge and skills to patient care. A total of 509 Ukrainian healthcare providers completed the PTF course, including 63 who were trained as instructors. Knowledge scores significantly improved (mean 71.8% to 87.3%, $p < 0.05$), and post-course self-confidence increased across all 21 measures ($p < 0.001$). Ukrainian instructors received higher participant evaluation scores than international instructors. Six to eight-week follow-up data ($n=91$) showed that 73% of respondents had shared course knowledge with others and used it clinically.

The PTF course successfully enhanced paediatric trauma care competencies in Ukraine through a scalable and locally led training model. High participant satisfaction, instructor effectiveness, and knowledge retention underscore the feasibility of implementing high-impact education during conflict. This model may be replicable in other humanitarian settings with appropriate contextual adaptation.

Course Demographics

Demographics	
Total number of participants	509
Sex	
Female	379 (74.5%)
Male	130 (25.5%)
Age [median (IQR)]	36 (28,48)
Healthcare workers	
Yes	509 (100.0%)
No	0 (0.0%)
Experience	
Years of experience in trauma care (median(IQR))	2 (0,12)
Years of experience in profession (median(IQR))	1 (0,8)
Training/expertise	
Doctor	377 (74.1%)
Nurse	118 (23.2%)
Medical assistant	14 (2.8%)
Specialty	
Pediatrics	125 (24.6%)
Emergency medicine	128 (25.1%)
Family/internal medicine	46 (9.0%)
Anesthesiology	56 (11.0%)
Surgery	86 (16.9%)
Other	35 (6.9%)
Not specified	33 (6.5%)

Knowledge Acquisition

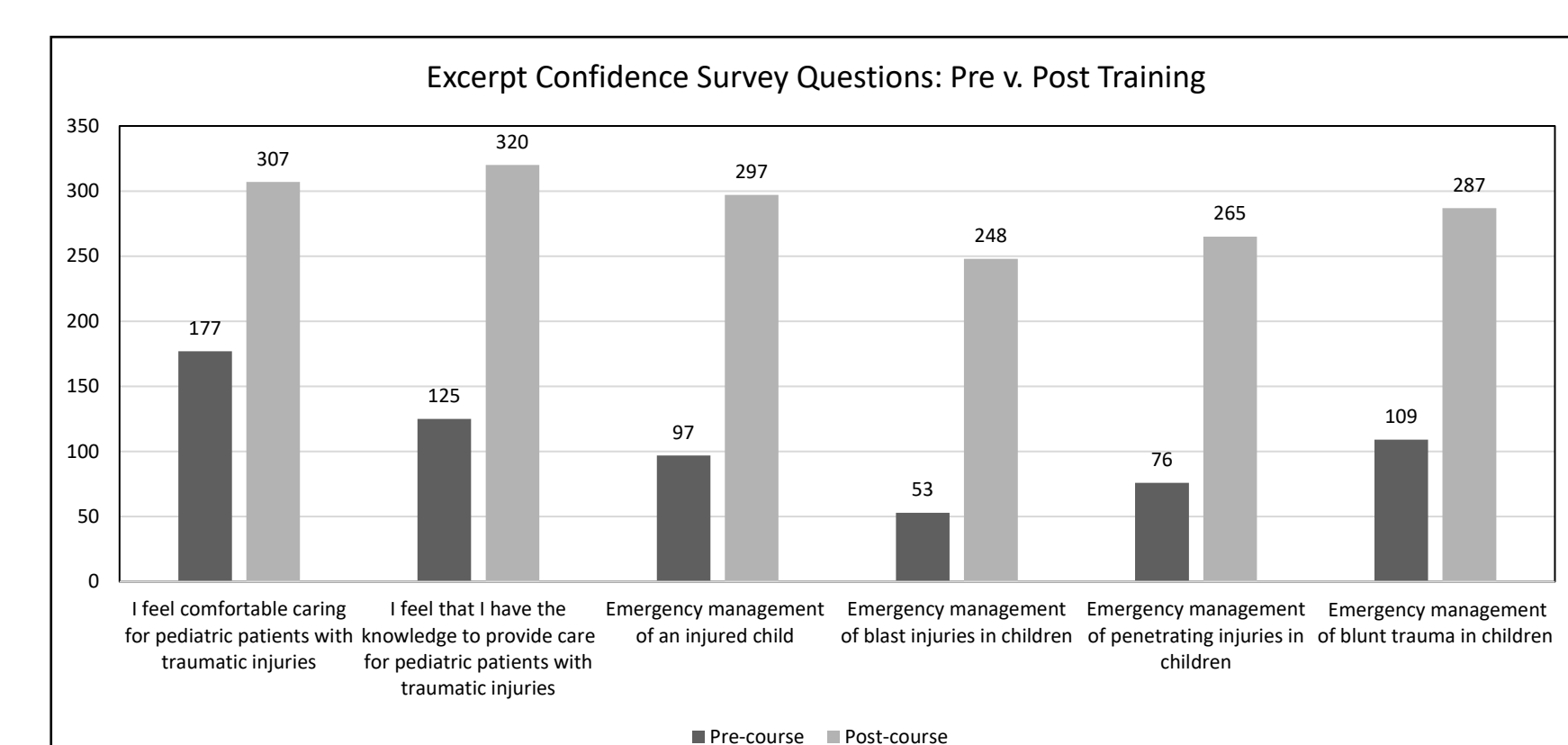
Instructor	Participants (n)	Pre-test mean (SD)	Post-test mean (SD)	p-value*
International instructor led courses	310	71.3% (11.5)	86.9% (9.0)	$p < 0.05$
Ukrainian Instructor-led courses	118	73.1% (12.0)	88.4% (9.0)	$p < 0.05$
Total	428**	71.8% (11.7)	87.3% (9.0)	$p < 0.05$

*Paired t-test **Variance in total number of participants and number of participants with matched test results were due to multiple reasons, including course incompleteness by participants and data entry errors resulting in the inability to match participants

- **Knowledge Increase (Overall):** From 71.8% → 87.3% after training.
- **International Instructor Courses:** +15.6% improvement.
- **Ukrainian Instructor Courses:** +15.3% improvement.
- **Statistical Significance:** All improvements were highly significant ($p < 0.05$).
- **Both international and Ukrainian instructors achieved strong learning outcomes, with Ukrainian-led sessions showing slightly higher post-test scores.**

Boosting Confidence and Skills to Provide Paediatric Trauma Care

- **Self-reported confidence and self-efficacy increased across every measured competency (21 competencies assessed),** with no areas showing stagnation or decline.
- **All pre- vs. post-training differences were statistically significant ($p < .001$),** demonstrating reliable and meaningful improvement.
- **Matched data from 351 participants across all training sessions** provide strong evidence of the program's impact.
- **Participants reported greater confidence in paediatric trauma care skills immediately after the course,** regardless of training site or instructor group.
- **Findings support the PTF model as a scalable, effective intervention in conflict-affected settings,** with broad applicability rather than narrow domain gains.



Limitations: Six- to eight-week follow-up had a 20% response rate, limiting insight into long-term application of skills. A detailed instructor manual and instructor trainings were used to standardize teaching; however, active conflict occasionally disrupted course delivery.



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