

students, despite statistical difference in pre-test scores (median, IQR: 9.0 (7.5–10±2.0); 7.0 (5.7–9.0) respectively;  $p=0.048$ , Mann Whitney U-test), there were no statistical differences in post-test scores (median, IQR: 14.0 (13.0–14.0); 13.0 (12.0–14.0), respectively, Mann Whitney U-test). All students recognized nerve agent toxidrome and performed SALT triage after the training ( $p < 0.0001$ , McNemar test). Subjectively, participant comfort level in responding to a chemical or radiological incident improved ( $p < 0.0001$ , McNemar test). Individual risk perception for chemical or radiological disasters did not improve after training.

**Discussion:** Improvement of knowledge and comfort was demonstrated, irrespective of previous experience. Simulation-based training of chemical and radiation disaster preparedness, led by medical toxicologists, is an effective means of educating PH and nursing students, with minimal prior fluency.

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### Chemical Response Emergency Medical Information System in Chemical Disaster

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**Introduction:** There are many database sets and websites which provide chemical information, but they do not perform an adequate role for emergency medical support in a chemical disaster.

**Aim:** To make the basis of a chemical emergency medical information system.

**Methods:** We reviewed the database sets, mobile applications and websites in the world which provide chemical database and emergency medical response information from a chemical accident or disaster site to hospitals. Also, we examined chemical accident cases which developed during disasters. A chemical database set for emergency medical response was proposed and the algorithm for elicitation of chemicals suitable for emergency medical response and information providing. We performed a survey about chemical emergency medical information system to related personnel.

**Results:** By four steps of elicitation of chemicals, the number of chemicals more than 100,000 was decreased to less than 1,000. The standard of steps includes accident preparedness, toxicity and circulating amount and expert consultation. Algorithm for elicitation of chemicals was made and 82% of related personnel supported the chemical emergency response algorithm. The emergency medical real-time consultation system for chemical disaster was placed under control of the call center.

**Discussion:** When mass exposure by toxic chemicals occurs, the chemical emergency medical information system will be helpful for acute identification of chemicals, protection of related personnel and emergency medical response. Also, it can be possible to guide citizens immediately in case of a chemical disaster.

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### Collaboration between a Hospital and the Surrounding Communities in an Emergency and Disaster

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**Introduction:** Muhammadiyah, the Indonesia non-governmental organization (NGO), has more than 300 hospitals. It is one of the forerunners of the Safe Hospital Initiative in Indonesia beginning in 2008. Muhammadiyah realized that hospital strengthening must be done in collaboration with community strengthening. From 2016 to 2018, Muhammadiyah ran a program named Hospital Preparedness and Community Readiness for Emergency and Disaster (HPCRED) that was carried out through strengthening two hospitals and their surrounding communities in Palangka Raya, Central Kalimantan, and Bima, West Nusa Tenggara (NTB). This program was funded by the Australian Government and is in line with the Safe Hospital Comprehensive Framework of the World Health Organization (WHO).

**Aim:** To strengthen hospitals and the surrounding communities to prepare for emergencies and disasters.

**Methods:** HPCRED completed 92 activities in two areas consisting of the following: 10 training, 26 workshops, 12 exercises, four monitoring and evaluation meetings, and seven technical sessions/seminars. The exercises consisted of tabletop exercises, skill drills, command post exercise, and full-scale exercise.

**Results:** There were positive changes in the hospitals and communities particularly on disaster management, policy, procedures, staff and community skills, knowledge, and behavior. The integration and collaboration between the hospital surrounding communities were established and can be examined by documents, agreements, and activities done together between the hospital and community during and after the program.

**Discussion:** Before the program, hospitals were not ready to face disasters. PKU Bima Hospital collapsed during a flash flood in December 2016. The community, to save housing from water, hollowed the hospital wall out causing water entrance into the hospital. It meant there were no communication and coordination between the hospital and its community. HPCRED not only made them communicate and coordinate but also collaborate and cooperate to reduce risks and response disasters such as responding Lombok Earthquake in July 2018.

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