ABSTRACT

High Knowledge, Uneven Readiness: Emergency Preparedness and Safety Gaps across University Laboratories in East Kalimantan, Indonesia

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Background : University laboratories involve diverse hazards requiring not only individual safety knowledge but also effective organizational systems and emergency infrastructure. Discrepancies between these dimensions may compromise emergency response despite knowledgeable personnel.

Objective : To assess emergency preparedness among university laboratory personnel and examine relationships and gaps between safety knowledge, individual emergency competence, organizational preparedness, and facility readiness.

Research Methods/ Implementation Methods : A cross-sectional study was conducted among 30 laboratory personnel at Universitas Mulawarman, East Kalimantan, Indonesia. The questionnaire assessed objective knowledge (0-10), individual emergency competence, organizational preparedness, and facility readiness (1-4 scales). Internal consistency, Spearman correlations, Friedman tests, and paired Wilcoxon signed rank tests were applied.

Results : Objective knowledge was high (mean=9.73±0.52), while individual competence (3.18±0.42), organizational preparedness (2.94±0.66), and facility readiness (2.61±0.73) showed a progressive decline. Internal consistency was high for individual competence (Cronbach's α=0.929), organizational preparedness (α=0.966), and facility readiness (α=0.873). The three preparedness domains differed significantly (Friedman χ^2=19.67, $p<0.001$), with facility readiness significantly lower than individual competence ($p<0.001$) and organizational preparedness ($p=0.009$). Individual competence correlated strongly with organizational preparedness ($r=0.703$, $p<0.001$) and moderately with facility readiness ($r=0.466$, $p=0.010$). Organizational preparedness was also associated with facility readiness ($r=0.450$, $p=0.013$). Chemical spills were reported by 50.0% of respondents, whereas only 30.0% rated spill response resources as generally ready or readily accessible. The findings demonstrate a significant knowledge to readiness gap, suggesting that high individual capability alone does not ensure institutional emergency preparedness.

Conclusion/Lesson Learned : Universities should prioritize hazard specific emergency resources, periodic drills, equipment inspection, and stronger organizational preparedness systems to translate safety knowledge into operational readiness.

Keyword : emergency preparedness; laboratory safety; safety readiness; occupational safety; university laboratory; emergency response