Increasing Perceived Levels of Disaster Preparedness Among Emergency Department Staff

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Background

Globally, disasters are increasing in frequency and magnitude. Emergency Department (ED) staff are on the frontlines of disaster response. Existing literature on this topic is geographically limited and reveals that perceived levels of disaster preparedness (DP) among emergency nurses (ENs) and technicians (EDTs) are lacking.[1,3,4] This is concerning and could potentially have a significant impact on overall disaster response and recovery efforts. Current studies show that disaster response experience and education/training are the primary factors associated with increased levels of preparedness. Existing research also shows that education initiatives are effective in increasing DP levels.[2,4]

Purpose

1. Measure perceived levels of DP among ENs and EDTs at one community hospital in Southern California.
2. Determine what factors are associated with increased levels of perceived preparedness.
3. Increase levels of perceived DP through an ED specific education initiative.

Methods

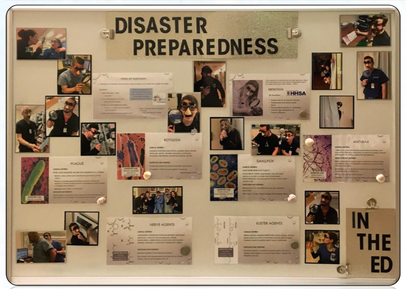
An adapted version of the Emergency Preparedness Information Questionnaire (EPIQ)[2] was administered to ED staff to assess perceived preparedness levels before and after a developed DP education intervention.

EPIQ consists of the following categories using questions with scaled responses measuring familiarity with each topic:

- Triage and Basic First Aid
- Biological Agent Detection
- Accessing Critical Resources
- Incident Command System
- Isolation, Quarantine and Decontamination
- Psychological Issues
- Epidemiology and Clinical Decision Making
- Communication and Connectivity

DP information was disseminated slowly via shift huddles, emails, posted information in the department and during staff meetings over the six month study period. This curriculum was created utilizing the hospital's existing emergency operation plan as well as additional resources from the CDC, FEMA and published literature. Demographical data and personal and professional preparedness information were also collected and staff participation was voluntary. Descriptive statistics and *t*-tests were analyzed with Microsoft Excel and R-Programming to examine relationships between personal and professional factors and perceived levels of DP.

Data Analysis

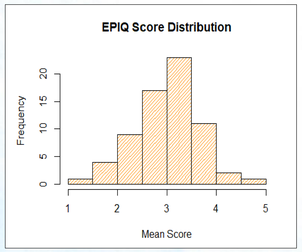


- Pre-tests were completed by 68 individuals; 54 ENs and 14 EDTs for an initial response rate of 69.4%.
- Post-tests were completed by 39 individuals; 32 ENs and 7 EDTs, a re-response rate of 54.4%.

Likert scores of familiarities on a scale of 1 to 5 (least to most familiar) were analyzed for measures of central tendency. T-tests were used to help analyze relationships between demographical factors and mean EPIQ scores from the pre-tests. Paired *t*-tests were used to help determine if a difference existed between pre and post test means of respondents.

Results

Highest Mean Familiarity Score	Lowest Mean Familiarity Score
Triage & First Aid (3.58)	Incident Command System (2.66)
Psychological Issues (3.41)	Epidemiology & Clinical Decision Making (2.84)
Tied: Communications & Connectivity; Isolation, Decontamination & Quarantine (3.04)	Accessing Critical Resources (2.9)

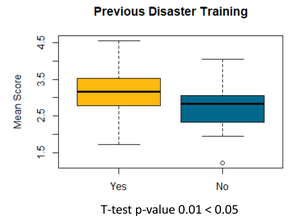


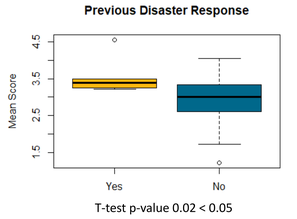
- The mean score of the pre-test was 3.03 (n=68), indicating staff reported limited knowledge on this topic.
- The mean score of the post-test was 3.98 (n=39), indicating staff felt familiar with the topics, but not thoroughly proficient in all subject matter.
- There was a 0.89 increase from the mean pre-test scores of 3.07 (n=39), (p-value = 2.69E-13 < 0.05) which was found to be statistically significant.
- The top three categories with the greatest amount of improvement pertained to the Incident Command System (green), Epidemiology and Clinical Decision Making (orange), and Accessing Critical Resources (yellow).
  - Interestingly, these were the categories with the lowest mean familiarity scores from the pre-tests.

EPIQ Familiarity Scores: Mean Improvement

Dimension	Mean Familiarity Score Before & After Intervention		
	Before	After	Difference
Q1. Performance of a rapid physical and mental assessment	4.03	4.21	0.18
Q2. Assisting with triage (START Model)	3.21	4.13	0.92
Q3. Basic first aid in a large-scale emergency event	3.74	4.31	0.39
Q4. Recognition of relevant signs and symptoms	3.06	3.85	0.79
Q5. Modes of transmission	3.15	3.87	0.72
Q6. Appropriate antidote and prophylactic medicine	2.67	3.60	0.93
Q7. Possible adverse reactions or complications	2.77	3.63	0.86
Q8. Signs and symptoms of exposure to different biological agents	2.79	3.77	0.98
Q9. When to report an unusual set of symptoms to the local and state health department	2.85	3.93	1.08
Q10. Knowledge of an Emergency Operation Plan (EOP)	2.90	3.97	1.07
Q11. Processes of the ICS	2.64	3.81	1.17
Q12. Agency preparedness information	2.54	3.77	1.23
Q13. The content of the EOP at hospital	2.64	3.77	1.13
Q14. Isolation procedures for persons exposed to biological or chemical agents	3.06	4.05	0.99
Q15. Signs and symptoms of posttraumatic stress following a disaster	3.41	4.18	0.77
Q16. Appropriate psychosocial needs and resources for victims	3.32	4.03	0.71
Q17. Ability to discern and treat persons with comorbidities whom are exposed to chemical agents, biological agents and /or radiation	2.74	3.79	1.05
Q18. Procedures for communicating critical patient information for transporting patients during a disaster	3.03	4.03	1.00
Total Mean Familiarity Score	**3.07**	**3.98**	**0.89**
Mean Sample Variance	0.76	0.60	0.16

Results





Disaster response and prior disaster training/education were consistent with higher mean EPIQ scores from the pre-tests (n=68).

Discussion

These results are consistent with existing studies that state ED staff feel underprepared for disasters.[2] Prior disaster response and disaster training and education were found to correlate with increased levels of perceived preparedness (n=68). Results support that an ED specific DP curriculum implemented over a longer period of time can increase EN and EDT's perceived levels of preparedness (n=39).

Limitations of this study include the geographical bias, lack of statistical power (initial and repeat sample sizes) and potential bias, as the primary investigator was also an RN in the ED during the project's implementation. Convenience sampling was used and measured self-perception, which is subjective.

Implications

The occurrence of disasters cannot always be predicted or controlled, but we can certainly anticipate that they *will* happen and educate ourselves in preparation. DP education became a part of this ED's culture and improved perceived disaster preparedness levels over a six-month period of time. The integration of concise, relevant information on this topic is something that could be implemented in any ED interested in developing a more confident and prepared workforce.

References

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