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Increasing Awareness of Emergency Preparedness and Mass Sheltering among Georgia Department of Public Health Nurses with Core Competency Training: A Quality Improvement Project

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Abstract

Purpose: To increase Georgia's public health nurses' (GA DPH) knowledge of disaster response after implementing an educational intervention utilizing the Emergency Information Questionnaire Survey (EPIQ) tool to measure variations in core competency levels.

Background: A GA DPH survey revealed that less than 50% of their nurses were competent in disaster response. A literature review shows that nurses with disaster preparedness training and experience are more likely to report for duty and perform successfully during disasters and unforeseen events.

Methods: The project used a pre- & post-test descriptive design, an online six-module educational intervention, and virtual participation in a tabletop exercise.

Results: 248 GA DPH nurses participated in this project. A paired samples t-test was used to compare pre- & post- EPIQ scores to determine any statistical significance (a= 0.05). The overall familiarity score showed a statistically significant improvement ($p < .001$; 98% confidence interval) related to emergency preparedness core competencies, with an average pre-survey familiarity score of 57.78 and an average post-survey familiarity score of 70.43.

Implications: The success of this project will serve as a foundation for further research in disaster response training for public health nurses in Georgia and abroad.

Conclusion: A six-module educational intervention improved public health nursing knowledge of emergency preparedness and mass sheltering competencies. GA DPH nurses should now possess the knowledge and tools to respond promptly and efficiently following a disaster. Frequent disaster response training will enhance nurses' confidence as they anticipate providing frontline services for our communities.

Key Words: Emergency Preparedness, Public Health, Disaster Response

Acknowledgments

First, I would like to thank God, from whom all blessings flow. He has endowed me with the wisdom, knowledge, and understanding to persevere through this journey. I would also like to thank my family, who have stood by me every step of the way; without them, I could not have accomplished this task. I am forever grateful to my DNP chair, Dr. Lisa Cranwell-Bruce, for the leadership and guidance she has given me selflessly to ensure I reach my goals. I want to thank Dr. Ashlie Pullen, who provided incredible support and leadership during this process. Lastly, I would like to offer the most profound gratitude to the Georgia Department of Public Health for allowing this Quality Improvement project to be implemented with their staff.

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Introduction

Background & Significance

According to the National Oceanic and Atmospheric Administration (NOAA), the United States has seen nearly 300 natural disasters over the past forty years. Each disaster carried an estimated financial burden of 1 billion dollars. These disasters occur an average of seven per year, with deaths of nearly 400 people (NOAA, 2021). Georgia's organizational hierarchy for emergency preparedness and response starts with Georgia Emergency Management and Homeland Security (GEMA/HS). GEMA/HS is responsible for organizing and coordinating system-wide federal funding to aid in recovery response during a natural disaster. This agency works with local, state, national, and others to ensure an effective and timely disaster response. The Georgia Department of Public Health (DPH) currently has policies and procedures that GEMA activates to respond to emergency disasters and requests for mass sheltering (GEMA, 2021).

Disasters are seemingly becoming more common in the United States. Manufactured and natural disasters can result in major problems requiring disaster response and the need to shelter in place for safety. Despite the disaster type, much loss is suffered, including but not limited to economic and social losses (Stratuss, 2022). Preparing frontline staff with the appropriate policies and procedures to follow during disasters impacts staff reporting for work during disastrous conditions (McNeill et al., 2020). This project highlighted the competency levels of organizations and agencies responsible for responding to these disasters.

The Emergency Preparedness Information Questionnaire (EPIQ) is an evidence-based research tool encompassing eight competency areas utilized to measure emergency preparedness skills (Wisniewski et al., 2004). Ensuring nurses, who comprise a large part of health care

workers, have appropriate training and competency in emergency preparedness is imperative to increase response time and efficiency during times of crisis and disaster. The Georgia Department of Public Health nurses' inadequate awareness of emergency preparedness and disaster response shows the necessity for the project (A. Pullen, personal communications, October 01, 2021). There is a necessity among people to be prepared to interact within the natural confines of our community, whether those interactions be positive or undesirable. This project showed the ability of the DNP scholar to construct and coordinate new procedures within communities to promote ease of emergency response and desirable patient outcomes.

Problem Statement

In April 2021, the Office of Nursing Services for the DPH surveyed their nurses regarding their competency level surrounding disaster response. In an interview, the Chief Deputy Nurse of GA DPH, Dr. Ashlie Pullen, conferred that` only "forty-five percent of their nurses were aware of emergency preparedness and mass sheltering protocols" (A. Pullen, personal communications, October 01, 2021). Discovering this immense knowledge gap, a collaboration of leaders within DPH was facilitated to enhance competency levels and disaster response capabilities among GA DPH nurses. Ensuring nurses, who comprise a large part of health care workers, have appropriate training and competency in emergency preparedness is imperative to increase response time and efficiency during times of crisis and disaster (Dang & Dearholt, S., 2017). Implementing education to promote engagement of the public health nurse in these competencies proved to aid in improving their ability to respond when disasters occur.

Clinical Practice Question

This project asked the question: Does knowledge of disaster response among Georgia Public Health Nurses increase after implementing training in emergency preparedness and mass sheltering?

***Population*:** The target population for this project is the Georgia Public Health Nurses. The DPH has 159 county health departments with 18 districts and currently employs approximately 250 nurses (GADPH, 2021). All DPH registered nurses were asked to participate in the project, along with a select number of Licensed Practical nurses. The participating nurses are educated with License Technical Diploma, Associate Degree in Nursing through the Doctor of Nursing Practice and Philosophy Degrees in Nursing. The exclusion criteria will be all other Georgia Department of Public Health staff.

***Intervention*:** The intervention utilized in this project is an extensive 6-module online educational training for all DPH nurses. These modules provided educational training to include the following topics:

1. Introduction to Emergency Management for Public Health Nurses
2. Role of the Nurse in a General Population Shelter: An Overview
3. Introduction to Health Services in General Population Shelters
4. Triage and Assessment in Shelters
5. Managing Biological, Chemical, and Radiological Agents Exposures in Shelters
6. Psychological First Aid

Nurses completed a pre-assessment questionnaire using the EPIQ tool to measure baseline competence. The nurses were then asked to complete the online educational

modules and attend a tabletop live session for skill simulation exercises. After online training modules and tabletop exercises were completed, the nurses were asked to complete a post-assessment using the EPIQ to measure improvement in emergency preparedness and mass sheltering competence.

Comparison: The project measured nurses' level of competency in emergency preparedness and mass sheltering using pre-and-post-EPIQ tool scores.

***Outcomes*:** To increase awareness of emergency preparedness and mass sheltering in GA DPH nurses.

Purpose of the Project

When a disaster occurs, disaster response should be rapid and effective to decrease the loss of life and improve population outcomes. Due to the lack of awareness of GA DPH nurses in disaster response, this project implementation enhanced knowledge through training using the EPIQ as a measuring tool. The sole purpose of this project was to investigate the effectiveness of the implemented training courses on core competencies among GA DPH nurses focused on emergency preparedness and mass sheltering.

Literature Review

Search Strategy

The DNP student conducted a literature review to better understand current standards regarding education and training in emergency preparedness and mass sheltering. The student used several databases to perform an extensive search. PubMed, CINAHL, Google Scholar, and EBSCOhost were viewed in this search. The key terms for this search were: *emergency preparedness, mass sheltering, nurse education, disaster response, public health, EPIQ, and*

core competencies in emergency preparedness. The search criteria for the literature review included research, full text, and peer-reviewed articles limited to the past five years. Only articles in the English language were used for the project. The CINAHL database was the most productive resource for gathering information regarding the project topic. The initial query using keywords related to the research project yielded 940 articles. The DNP student thoroughly reviewed abstracts and research designs and narrowed the results to 15 articles.

Themes of Literature

The scholarly project illustrated the advantage of training in emergency preparedness and mass sheltering with GA DPH nurses to improve awareness of competence in this area. The success of this training was measured utilizing the EPIQ tool pre-and post-survey results. The literature was evaluated to determine the research's significance. The refined literature review yielded 10 level IIIs, four level V's, and one level II research article. Three articles outside the five-year reference range were purposefully selected to support the foundational need for this project. The remaining articles support the need and recurring issues of nurses lacking competence in emergency preparedness and mass sheltering. Emaliyawati et al. (2021) show factors associated with nurse preparedness in disaster management in a cross-sectional study. This study concluded that nurses with disaster preparedness experience exhibit more confidence when responding to natural disasters and unforeseen events.

A research study by Wisniewski et al. (2004) identified eight emergency preparedness dimensions investigated in a study. Although this article exceeds the date range of the query, its use was vital because the research established the foundation of the EPIQ tool. The literature review further reinforced the importance of educating nurses who will serve during public health emergencies and natural disasters. Another exploratory cross-sectional survey by McNeill et al.

(2020) determined that when nurses are not knowledgeable of competencies surrounding disaster response and emergency preparedness, they are less likely to report to work after a disastrous event. An insufficient number of frontline workers during a natural disaster or public health crisis inadvertently creates a tragedy. Omar and Baker (2021) further emphasized the need for nurse disaster preparation to respond efficiently.

Impact of Education

In a 2015 quality improvement project, Georgino et al. directly correlated education and competency scores, further confirming the need for more training in this area. Peters et al. (2012) developed a public health risk assessment tool that measures readiness preparedness. Although this study was outdated, the scholar will show the importance of preparing communities for the planning phase of disasters. It also shows how emergency preparedness improves over time with proper planning. In a pilot study in 2020, Goniewicz and Goniewicz displayed variations in work ethics among nurses who were inadequately prepared regarding emergency response and validated the need for more frequent training.

Key Partners in Emergency Preparedness

Eisenman et al. (2017) performed a qualitative study using a Getting to Outcomes guide for community emergency preparedness to improve household emergency preparedness. This literature review also stressed the importance of stakeholders during emergencies and disasters, linking communication between hospitals and public health agencies in a qualitative study by Markiewicz et al. (2012). Although this article's date is out of range, it offers insight into crucial stakeholders in emergency preparedness in linking critical resources. Even with the inclusion of key players in emergency preparedness, Shabbir et al. (2017) opened additional avenues which could be further studied in future studies. This cross-sectional descriptive design study concluded

that nurses displayed poor performance even with the proper knowledge and training on emergency preparedness (Shabbir et al., 2017).

Evaluation of Training

The DNP student used the EPIQ tool to measure the success of the training implemented with the GA DPH. The EPIQ is an evidence-based tool that will validate the nurse's scores after training. In a study by Tavan et al. (2016), a similar tool to EPIQ tested the validity and reliability of the instrument as well. This study also stressed the importance of knowing the nurse's baseline knowledge to gauge the needed training. Schroder and Bouldin (2019) demonstrated the importance of understanding the functional needs of the people within the community to improve patient outcomes. Langan et al. (2017) emphasized the need for additional evidence-based training for the healthcare workforce in disaster readiness. Chiossi et al. (2020) provided the DNP student with a foundation for reviewing public health emergency preparedness assessment tools. As Chiossi stressed, the scholar must suspend personal biases and influences while synthesizing data collected to ensure the validity of research findings. How materials are presented to the nurses during the emergency preparedness training can directly affect learning abilities, retention, and post-training competency levels. The student heavily critiqued delivery methods during the research project to ensure effectiveness despite the mode of delivery. This critique included monitoring of training platform to ensure nurses were participating in training and not experiencing any technological challenges in completing the training modules.

Modes of Training Delivery

In efforts to combat the unrelenting restrictions of the 2019 Coronavirus (COVID-19) pandemic, Hodges et al. (2020) reviewed the impact of implementing online learning in the event

of emergency or crises among several colleges and universities within the United States. The article emphasized the importance of course design and planning to deliver education effectively (Hodges et al., 2020). It was determined that courses were most effective if designed to be presented face-to-face and online before implementing the course. If courses are designed for face-to-face presentation only, it is doubtful they will be effective upon emergency online implementation (Hodges et al., 2020). Although traditional in-person learning has reigned the most effective teaching method for an eternity, when faced with environmental challenges like COVID-19, it is pertinent to this research project to design an emergency preparedness and mass sheltering training course that will prove effective in-person and virtually.

Evaluation of Evidence

The literature review results further emphasized the validity of the focus of this DNP research project. As previously highlighted by the Georgia Public Health Chief Deputy Nurse, Dr. Ashlie Pullen, the DPH survey vividly depicted knowledge gaps among nurses in public healthcare settings (A. Pullen, 2021). Dr. Pullen's concentration on the dire need to increase awareness of emergency preparedness and mass sheltering fostered plans to improve the knowledge gaps among DPH nurses in Georgia. As a DNP-prepared nurse, Dr. Pullen's leadership role within the DPH agency exemplified nurses as central change agents within the healthcare realm. Nurses prepared with the terminal DNP degree employ the ever-evolving and enigmatic atmosphere of healthcare to successfully transform and ensure positive patient outcomes (McCaffrey, R., 2012).

Upon completing the literature review, there was sufficient evidence to support the implementation of new interventions in emergency preparedness and mass sheltering to spearhead a change in clinical practices among GA DPH nurses. Schroeder and Bouldin (2019)

emphasize vulnerability as the key culprit in all populations when determining the outcomes of a natural disaster or unforeseen event. If pre-existing community barriers inhibit access to resources, those communities will have trouble adapting to the negative impact and likely experience overall adverse outcomes (Schroeder & Bouldin, 2019). "During an emergency, people who frequently need additional response assistance as a result of an access or functional need include those who live in institutional settings, older adults, children, people with disabilities, people with limited English proficiency, and people experiencing homelessness" (Schroeder & Bouldin, para. 3, 2019). This literature changed the perspective of emergency preparedness and response from healthcare workers and emergency responders to those individuals within a community. Acknowledging the pre-existing community conditions before project planning enabled the researcher to adopt the plan, which was the basis of this DNP research study.

Strengths & Limitations

Several of the articles were older than the five-year reference range; however, they contributed to this project. Georgino et al., 2015, was used to support the fact that nurses are not educationally prepared for emergency response. Markiewicz et al., 2012, revealed relevant literature on public health endeavors to improve emergency preparedness among their staff. Wisniewski et al., 2004, highlighted the need for emergency preparedness training using the EPIQ tool. Some of the evidence reviewed only studied specific practice areas, which may prohibit the general application of research findings. Acknowledgment of the need for improvement by the Deputy Chief Nurse for the GA DPH stresses the necessity for further training in emergency preparedness and mass sheltering. Many of the articles revealed the need

for training in emergency preparedness and disaster response by staff designated as first responders. These findings strengthen the overall relevance of this DNP project.

Conceptual Framework/ Theoretical Framework

Plan-Do-Study-Act (PDSA) is a conceptual framework developed using the guidelines of Change Theory. PDSA is a quality improvement tool that evaluates the effectiveness of change by using four steps to monitor the implementation of new interventions and the outcomes (AHRQ, 2020). The scholar used this framework within the Doctor of Nursing Practice (DNP) project to display the progression of Georgia Department of Public Health (DPH) nurses during the implementation of new emergency preparedness and mass sheltering training courses. Figure one depicts the navigation process when using the PDSA framework.

Figure 1

Plan, Do, Study, Act Improvement Model.

(Institute for Healthcare Improvement, 2021)

The nursing process of assessment, diagnosis, planning, intervention, and evaluation is a part of the core curriculum in the nursing disciple and a familiar example that mirrors the PDSA quality improvement model (IHI, 2021). Just as the nursing process follows a stepwise approach, PDSA follows a similar methodology to test interventions for a change process. Since healthcare is evolutionary and continuous in motion, these frameworks serve as the scientific underpinnings of the change process. Table one shows the similarities between PDSA and the nursing process. Both frameworks can be used as change agents when researching or providing patient care.

Table 1

Elements of the Nursing Process Corresponding to the PDSA Model for Improvement.

Elements of the Nursing Process	Corresponding Questions/Steps of the PDSA Model for Improvement
Assessment	What are we trying to accomplish?
Diagnosis	How will we know that a change is an improvement?
Outcomes / Planning	What changes can we make that will result in improvement
Implementation	Plan, Do
Evaluation	Study (analyze findings); Act to adjust if needed

(Institute for Healthcare Improvement, 2021)

Plan

The DNP project aimed to implement an emergency preparedness training course for GA DPH nurses. The first step of the PDSA model is planning. During the planning stage of this project, the EPIQ was reviewed to determine its worth in preparing a training course. Survey questions were selected to administer to nurses to establish baseline knowledge and determine the most appropriate teaching methods. The scholar used the EPIQ tool to evaluate its effectiveness after implementing the training course.

Do

The next step of the PDSA model is doing. During this step, the pre-survey of the EPIQ tool measured the competency level of GA DPH nurses regarding emergency preparedness and mass sheltering before the implementation of training. The observations made during this step were beneficial for the construction of future training material to address knowledge gaps. The training course was implemented via asynchronous computer-based sessions, and the DNP scholar and members reviewed the training website to ensure the completion of all training modules. The training was tailored for in-person education as well. The guidelines of the EPIQ research tool outlined the training course using each of the eight core competencies: (1) triage and basic first aid; (2) biological agents; (3) the ability to access critical resources and reporting; (4) the incident command system (ICS); (5) isolation, quarantine, & decontamination, (6) psychological issues and specialty populations; (7) epidemiology and clinical decision making; and (8) communication and connectivity (Georgino et al., 2015).

The DNP scholar utilized the evidenced-based evaluation tool EPIQ to measure the DPH nurses' knowledge of the core competencies of emergency preparedness procedures. To date, this tool serves as the most reliable method to assess understanding of these competencies (Georgino et al., 2015). The pre-and post-survey and eight competency areas show the improvement of knowledge after training. Successful completion of the training and improvement of the EPIQ score indicates that the trainee is prepared to respond efficiently during disaster events (Georgino et al., 2015).

Study

Studying the data or results of the training was vital in determining the project's success. The post-survey of the EPIQ tool was given to the nurses to assess their knowledge of

emergency preparedness and mass sheltering after the training course. The training goal was to increase public health nurses' awareness of the competencies regarding emergency response. Pre- and post-survey results displayed whether the expected outcomes were achieved among this population of nurses.

The fundamental goal was to improve nurses' baseline knowledge and increase confidence if faced with an unforeseen disaster. The survey results also gave insight into the effectiveness of the training course and if it would be beneficial during disaster responses in the future.

Act

The final step of the PDSA model is the act. After the training course, it was determined that the training course would become a permanent part of the required training among GA DPH nurses to enhance disaster response. Because the training was deemed effective, it will be incorporated into required training for GA DPH employees. The EPIQ model will be used for revisions to ensure the continued efficiency of the course for years to come. The post-survey results can also be used during revisions to determine the best future training methods (video, live, read & respond).

The DNP scholar exemplifies competence in leadership and problem-solving at the organizational level (McCaffrey, R., 2012). This DNP project allowed the scholar to present the clinical problem and the process of implementing a problem-solving strategy—the project goal aimed to improve the quality of service and performance. The plan, do, study, act quality improvement model is a frequently used conceptual framework to highlight areas needing change. This project utilized theories and frameworks from the fundamentals of nursing to resolve and improve modern-day problems.

Although GA DPH has active policies and procedures for emergency response, leaders need to bring the awareness and understanding of those policies to the forefront for frontline nurses (A. Pullen, personal communications, October 01, 2021). This DNP project emphasized the role of nurse leaders in the innovation and application of change theory among healthcare disciplines to improve population outcomes during moments of diversion and disaster.

Project Design

This project used a Nonexperimental Quantitative Pre- and Post-survey Descriptive design with an online core competency educational training and virtual tabletop exercise.

Methodology

An antiquated process was followed to evaluate the GA DPH nurse's knowledge of emergency preparedness.

Participants

Eligibility for participation in this project was determined by employment as a nurse with the Georgia Department of Public Health (GA DPH). All GA DPH nurses were required to complete educational training regarding emergency preparedness and mass sheltering. After completing this training, the nurses were required to participate in a virtual tabletop exercise assessing their emergency response skills.

As a part of this DNP project, all nurses employed by the GA DPH were sent an invitation email to participate in a voluntary Pre- & Post-Emergency Preparedness Information Questionnaire (EPIQ) to assess their baseline knowledge of the core competencies regarding disaster response. The pre-EPIQ survey was completed before any educational intervention, and the post-EPIQ was completed after the educational intervention and virtual tabletop exercises were completed.

Population (Inclusion/Exclusion Criteria)

The inclusion criteria were all nurses employed by the Georgia Department of Public Health, and the exclusion criteria were any nurses outside of the Georgia Department of Public Health. This project used a nonexperimental quantitative pre- and post-survey descriptive design with an online core competency educational training and virtual tabletop exercise.

Sample Size

The target sample size for this project was 250 nurses, which included all the nurses employed by the GA DPH.

Setting

Due to the uncertainty of the COVID-19 virus, the setting of this project took place within the auspices of the GA DPH through their online workplace training website Exceed, along with an online survey through the web portal survey monkey. The GA DPH has 18 Districts serving 159 county health departments within Georgia (GA DPH, 2022). All sites within the GA DPH were included in this project.

Implementation/Intervention

Project Administration

Structure. The DNP project team contained a DNP chair, Dr. Lisa Cranwell-Bruce, and one additional team member, Dr. Ashlie Pullen, GA DPH. Project team members were easily accessible and available to support throughout the project. The DNP team met on average once per month and as necessary to discuss the project's progress.

Boundaries. The boundaries of this DNP project were identified as IRB approvals were obtained from GA DPH and GSU. The DNP scholar completed the application process for an internship at GA DPH to be permitted access to training files regarding core competency

training. The intern status aided in establishing a trusting relationship within the organization, which helped in successful project implementation (Moran et al., 2017). The internist completed security training as per project site requirements. All project team members observed their institution's boundaries and maintained collegiate professionalism.

Roles and Responsibilities. The roles and responsibilities of each team member were clearly defined to ensure ethical standards were maintained. The project chair functioned as the team manager and guided the project's progression. The project chair also served as a resource for problem-solving and conflict-resolution suggestions. The chair ensured the project's momentum and progressively moved it toward its goal. Other team members aid the project as needed to support the project's vision. The DNP student-led project implementation and ensured monthly meetings were scheduled to maintain a continuous flow of dialogue between team members (Moran et al., 2017).

Assumptions and Risks/Constraints

Assumptions. The DNP team could access the project site as necessary for project implementation, as the site for this project was virtual. The DNP student would participate in organizing core competency training for GA DPH nursing staff. The student would have access to staff to present training and request participation in the project via staff email. Project participants would have access to the organization's computer to complete pre- and post-EPIQ surveys and core competency training.

Risks/Constraints. In this study, the participant did not have any more risks than they would on a normal day of life. No injury was expected from this study, and participants were instructed to contact the research team as soon as possible if they believed they had been harmed. The project was virtual, as training and tabletop exercises were completed online, and EPIQ

surveys were transmitted electronically. There was minimal risk of the project participants being negatively impacted due to constraints (i.e., lack of staff, hurricane season, or computer access).

Risk Management Plan. A risk assessment plan was used to help organize the project's flow and guide the project's vision. It was also instrumental in identifying problems and the need to reorganize and potentially restart processes. The Plan, Do, Study Act (PDSA) is a conceptual framework and stepwise approach to guide the quality improvement process (AHRQ, 2020). This framework was used during implementation to monitor the current process and what improvements were noted after core competency training.

Monitoring Plan. The DNP student monitored project flow by monitoring pre-survey questionnaire completion in Survey Monkey and attending all Core Competency Tabletop exercise sessions. The Action Plan management tool was followed during project implementation, and this plan directed the project's who, what, where, when, why, and how (Moran et al., 2017). Using the Action Plan management tool ensured the project remained on track and helped to identify more precisely where issues were occurring during the implementation process.

Staffing Plan. The project includes three members: the DNP chair, the Project team member, and the DNP student.

Communication Management Plan. Communication during the project implementation occurred via email, WebEx/TEAMS, and telephone. Direct communication was facilitated through email with WebEx/TEAMS, and telephone communications will be available when necessary.

Software and Hardware Requirements

All project participants were employees of the GA DPH. All training and surveys

were completed on an agency computer. Each participant accessed the training and surveys through their work emails and the state of GA training program, Exceed. All data from the survey questionnaires were exported to Microsoft Excel for data analysis.

Security. There was no patient information collected during project implementation. The participants completed the pre-and post-EPIQ in survey monkey via an embedded link sent to their work emails. This email was sent to each nurse employed by the GA DPH. The link was only accessible through the participant's email, password-protected, and secured with firewall software through GA DPH. Should project publication occur, no identifiable information will be used from project participants. All information sent via electronic means will be stored in a password-protected device.

Work Breakdown Structure

Work Structure. The DNP project was identified as IRB approvals were obtained from GA DPH on 08.25.21 and GSU on 05.19.22. The Project team, including the Deputy Chief Nurse of the GA DPH, met to discuss the project details, implementation plan, and process. The DNP student also attended all meetings regarding compiling core competency training required for participation in this project. The project was implemented from June 1, 2022, to July 31, 2022. The participants were asked to complete the surveys before and after training was completed. The project data was collected, and the data analysis was completed by October 31, 2020. Data analysis results were presented to the project team upon completion.

Schedule/Time Management. IRB approval from both institutions, GSU and GA DPH was to be secured prior to project implementation. The project implementation phase began promptly following IRB approvals, and project implementation was completed by July 31, 2022. The DNP team met monthly to discuss project issues or concerns. *Table 1 shows the project milestones.*

Quality Management

Table 2

Project Milestones

Milestones	Description	Estimated Completion Date
GSU IRB Application	GSU IRB approval letter	May 19, 2022
Project Site IRB Application	Site IRB approval letter	August 25, 2021
Email participants	Recruitment letter with attached consent/questionnaire link	May 25, 2022
Questionnaire completion	All Survey Monkey EPIQ surveys returned electronically by participants	July 31, 2022
Data analysis	A meeting was scheduled with the biostatistician with a follow-up meeting after implementation.	May 27, 2022, and a follow-up meeting with a date TBD.
Project Defense	DNP project successfully defended	February 2, 2023

- **Adapted from Moran et al., 2017, p. 300**

Quality Indicators. The DNP project team members possessed the expertise and experience in Public Health, Mass Sheltering, Emergency Preparedness, and quality improvement projects. Framing of the research question was completed using the Population, Implementation, Comparison, and Outcomes (PICO) strategy.

Project Initiation Plan

The DNP project initiation was implemented promptly following IRB approvals from GSU and GA DPH. The invitation email was sent out to the GADPH nurse mailing list after IRB approval was obtained. The email introduced the student and the DNP project, along with a request for their participation. Project implementation began on June 1, 2022. Nurses were asked

to complete the EPIQ pre- and post-surveys via an online web-based platform (survey monkey), which will only be available to the DNP project team members.

The invitation email will state, "If you would like to participate in this important project, please complete the following pre-course survey. By completing this survey, you are consenting to participate in this study. The attached consent details how all information will be handled privately and confidentially. Participation is not required to complete the Mass Sheltering Training. Please see the link to the survey." A tally of pre-and post-EPIQ surveys was taken periodically during the implementation to determine if a reminder email should be sent. Project implementation ended on July 31, 2022. All surveys completed after the project end data were excluded from the project results.

After implementation, all EPIQ surveys were transferred to Microsoft Excel for Analysis. The Statistical Package for Social Science (SPSS) further analyzed the project data. The assistance of a statistician was elicited to complete the data analysis. The data analysis results, project details, and implications for practice were presented to the Deputy Chief nurse of the GA DPH and project chair.

Training Plan. This project included an online core competency training utilized as an intervention to improve awareness and knowledge of Emergency Preparedness and Mass Sheltering protocols. The training was required of all GA DPH nurses. The nurses were invited to participate in this project by an invitation email sent to their work email. They were asked to complete the pre-and post-EPIQ survey online via a web-based platform (Survey Monkey) link. Explanations and instructions for the questionnaire were given via invitation email.

Procurement Plan

The pre-and post-EPIQ surveys and core competency training were completed on work-based computer devices. All project phases were implemented and presented using GA DPH computers and software. No funding is required for this project, and no payment is offered for project participation.

Data Collection (Tool/Measure) Procedures

After the project implementation was complete and the data collection time frame expired, the DNP scholar extracted all data from survey monkey EPIQ pre- and post-survey results. This information was then downloaded to an Excel file to organize and compare EPIQ pre and post-survey results. The data was further analyzed in SPSS. All participants without matching pre- and post-survey results were excluded from the study due to participants' failure to complete all parts of the study requirements. Any survey completed after the project deadline expired was also excluded from the results of the project. All results were contained on a password-protected computer in the possession of the PI.

Tools

The Emergency Preparedness Information Questionnaire (EPIQ), an evidenced-based competency tool used in evaluating awareness of emergency preparedness, was used in this project (Wisniewski et al., 2004). This tool comprises eight competency domains with 44 survey questions (Georgino et al., 2015). Psychometric testing was completed on the original version of the EPIQ and proved good reliability and validity (Georgino et al., 2015). A modified version of the EPIQ was used for this project, with an 18-item questionnaire covering six competency areas. Additional psychometric testing for the modified version was not completed, although remarkable increases in familiarity scores were evident with the modified version of the EPIQ survey. The intervention utilized in this project was an extensive 6-module online educational

training for all GA DPH nurses. These modules provided educational training to include the following topics:

1. Introduction to Emergency Management for Public Health Nurses
2. Role of the Nurse in a General Population Shelter: An Overview
3. Introduction to Health Services in General Population Shelters
4. Triage and Assessment in Shelters
5. Managing Biological, Chemical, and Radiological Agents Exposures in Shelters
6. Psychological First Aid

The DNP scholar used the modified EPIQ in preparing the training course for the GA DPH nurses. Survey questions ascertained nurses' baseline knowledge of emergency preparedness and mass sheltering. Nurses were able to select from the following answer choices which match their perception of the content on the survey:

- I have never heard of this topic before. (1 point)
- I have heard the terminology before but have no knowledge of this information. (2 points)
- I know the terminology but have no knowledge of this topic. (3 points)
- I am familiar with this topic but not extremely proficient in all subject matter. (4 points)
- I am familiar with his topic; I am an expert in all proficiency on this topic. (5 points.)

After implementing the training course and virtual tabletop exercise, the student used the post-EPIQ to evaluate the educational intervention's effectiveness.

Analysis

Georgia State University's biostatistician was consulted to assist with analyzing the data collected. The Excel file was imported into SPSS, and descriptive statistics were performed on the data. The data from the EPIQ pre-survey was calculated, and baseline scores were documented. These scores were compared to the EPIQ post-survey to gauge the improvement in the nurses' perceived competence in emergency preparedness and mass sheltering.

Statistical Test

The goal of this project was to prove: Does knowledge of disaster response among Georgia Public Health Nurses increase after implementing training in emergency preparedness and mass sheltering? Statistical testing was conducted with the data collected and is outlined as follows:

A nonexperimental quantitative pre- and post-survey descriptive design with an online core competency educational training and virtual tabletop exercise was used for this project. Participants who did not complete a pre-and post-EPIQ survey were excluded from the analysis. Pre- and post-responses to individual items in the EPIQ survey were compared using a paired samples t-test to determine if any significant change occurred ($\alpha = 0.05$). In addition, an overall familiarity score was computed as the sum of responses for each participant in the EPIQ survey (max of 90 points) and compared using a pre- to post-paired samples t-test to determine if there was an overall statistical change. Table 2 shows Paired Sample t-test results.

Results

A total of 248 Georgia Department of public health nurses participated in the Emergency Preparedness and Mass Sheltering training. The tabletop exercises were conducted in 3 training sessions on June 28, July 13, and July 18, 2022. The overall familiarity score showed a

statistically significant improvement ($p < .001$; 98% confidence interval) related to emergency preparedness core competencies, with an average pre-survey familiarity score of 57.78 and an average post-survey familiarity score of 70.43. Additionally, each item in the EPIQ survey showed significant improvement in familiarity after the training session (see Table 2 for details).

Discussion

Current literature surrounding emergency preparedness reveals that many of the nurses who are tasked with responding to disasters are ill-equipped. The GA DPH, to ensure their nurses were ready for disaster response, found they were less than prepared or equipped with the knowledge and confidence to respond. Much of disaster response training is typically disseminated through in-person training with simulations to ascertain the trainee's response. As mentioned in the literature review, McNeil et al., 2020, state if nurses do not possess the knowledge and training in disaster response, they are less likely to show up at work following a disaster.

As the GA DPH conducted its annual training for its nursing staff, the stage was set to implement this DNP project to measure the effectiveness of an education intervention. The prior survey conducted by the Office of Nursing Services constituted the need for this training as a survey of the nurses revealed knowledge gaps in disaster response. Using the EPIQ survey as a guide for this project allowed pertinent information from a reliable instrument to be used to educate and assess nurses' competency levels.

The DNP student expected a captive audience for this project, as the GA DPH employs approximately 250 nurses, which was the target population for this project. There was an expectation that the number of participants would be high as the education intervention would serve as mandatory training for the nursing staff. There was also an expectation that the nurses

would gain an improved awareness of disaster response, thereby increasing their competency levels in this area. Due to the success of this training, there is an expectation that this training will serve as a gateway for future training in disaster response for Georgia nurses and those abroad.

Although the initial response to the EPIQ survey was encouraging, some unexpected findings were noted during the process. The initial response was that of 248 nurses; however, after data analysis, 117 surveys had to be excluded from the project. Some nurses completed both surveys prior to completing the educational intervention or attending one of the three virtual tabletop exercises. Some nurses completed two pre-EPIQ surveys or two post-EPIQ surveys, yielding these surveys as invalid for inclusion in the project results. There were several surveys completed after the project implementation deadline, which were also excluded from the results. These were unexpected findings of this project.

Based on the statistical analysis, public health nurses who completed this emergency preparedness training had a statistically significant increase in competencies and familiarity with emergency preparedness as defined by the EPIQ tool. The pilot study further provided valuable feedback and insight for public health leaders, nurses, and officials interested in taking positive steps in response to the Academy of Science's (2021) "Conclusion 8-1: The nation's nurses are not currently prepared for a disaster and public health emergency response." This pilot study demonstrated that public health nurses significantly increased disaster and emergency preparedness competencies after completing an evidence-based education training program.

Limitations

Training in disaster response is most often performed and preferred by the in-person modality. There is a lack of literature that supports this training through an online platform which

limits the number of studies to use as a comparison to gauge the effectiveness of this mode of training. Because of the decreased number of studies through this platform, there was a lack of buy-in from stakeholders. Public Health nurses are tasked with staffing shelters during times of disaster. Training in disaster response is targeted at those categorized as first responders, which limits the number of studies that include this population of nurses.

Implication for Clinical Practice

The DNP student holds a unique position in their ability to act as a change agent in translating evidence into practice. The DNP scholar performs at systems and organizational levels, which allows the representation of advanced practice nursing in a collaborative setting. The DNP Scholar functioned in leadership roles with this project and created change within the interprofessional team (McCaffrey, 2012). This project permitted the DNP scholar to evaluate training effectiveness, with the GA DPH nurses using an evidence-based training tool. The DNP role within this project allowed the scholar to implement practice changes based on the training and post-test survey results, fulfilling the role of advocate for all people in Georgia.

The education program created by this quality improvement project offers the DPH a structured, evidence-based program through a six-module competency training and an interactive workshop. For the patient population within the state of Georgia, this project validates that those nurses who participated benefited, as demonstrated by increased scores in both emergency preparedness competencies and overall familiarity, which ultimately, as a result, yield positive patient and community outcomes. Because of this project, the DPH will now use this program for annual training for their existing staff and new hires to improve public health emergency preparedness competencies and disaster response for all public health nurses in the state.

Plan for dissemination of information

The educational intervention used in this project has been accepted as the annual core competency training for all existing nurses and new hires for the GA DPH. The DNP scholar has presented this project and results to the Georgia Nursing Leadership Conference to further disseminate project results and educate others regarding the need for frequent, practical educational training in disaster response. This project will be presented as a podium presentation at the 2023 Preparedness Summit for disseminating knowledge in April 2023. A manuscript of this project has been submitted to the Journal of the Georgia Public Health Association for publication. This project will also be presented at the Georgia Public Health Association Annual Meeting and Conference for a roundtable discussion in May 2023. The DNP student will continue to disseminate the findings of this project to share the scholarship learned from this experience.

Conclusion

In conclusion, the lack of knowledge among GA DPH nurses in emergency preparedness and mass sheltering was the energy behind this DNP evidence-based practice project. The literature review revealed extensive research studies highlighting nurses' lack of knowledge and preparedness in emergency care. The most apparent theme noted within the review was the prevalence of a lack of response among nurses during emergencies due to a lack of knowledge of protocols and policies. The main goal of this project was to show the irrefutable significance of implementing a training course using the EPIQ research tool as a teaching guide and displaying the differences in competency levels among GA DPH nurses. As anticipated, this DNP-led project enhanced the knowledge of this specific population of nurses and strengthened future responses to natural disasters within various Georgia communities and those abroad.

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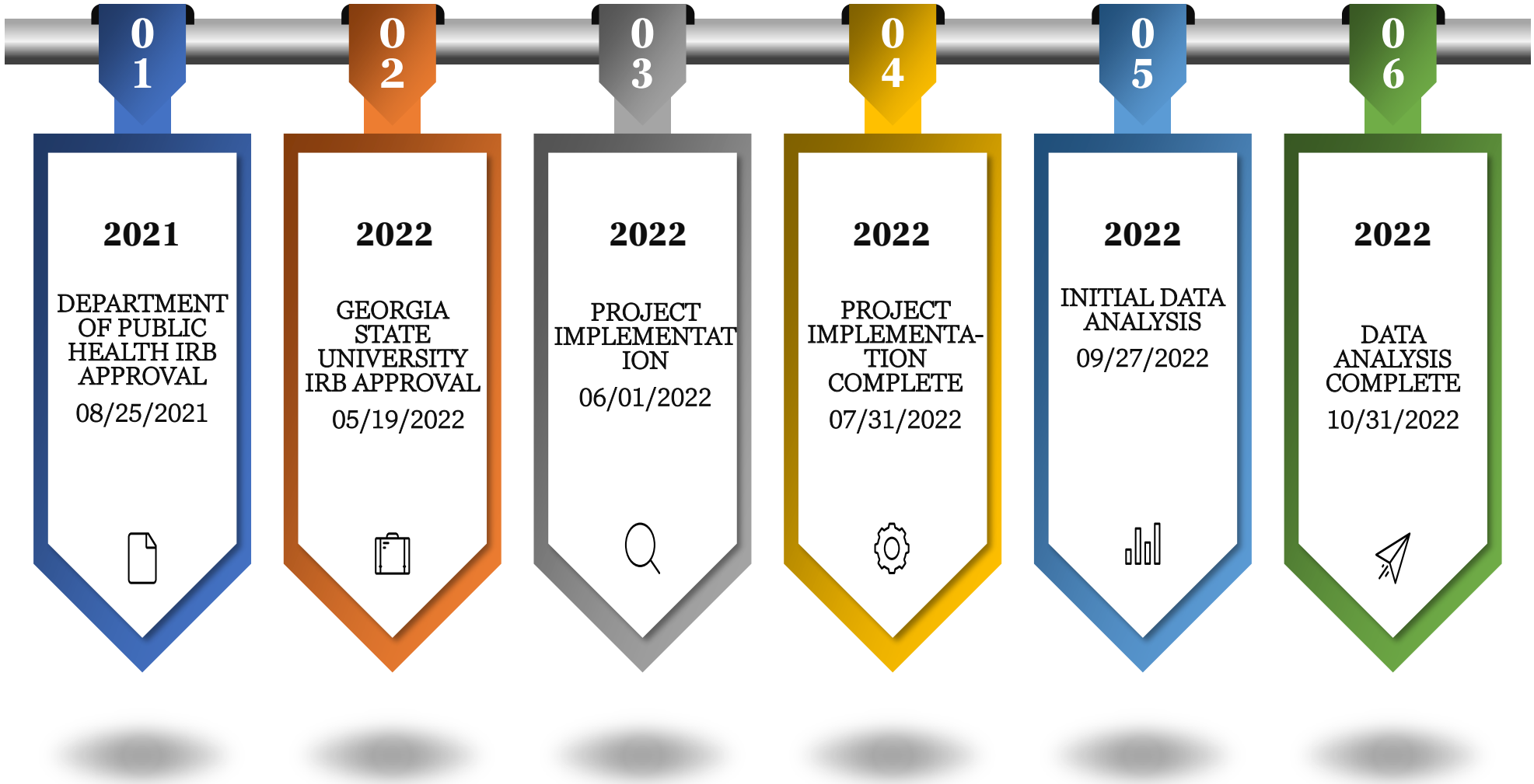
Results: Statistical Analysis of Mean Improvement in Familiarity Scores of All 18 Questions Within the 8 Core Competencies as Defined by the EPIQ on the Pre- and Post-test Surveys

Questions	Paired Differences					*t*	*df*	Significance (2-Tailed)
	Mean Familiarity Score Improvement	Standard Deviation	Standard Error Mean	98% Confidence Interval of the Difference				
				Lower	Upper			
Pre_Mean-Post_Mean	.702714	.511358	.044678	.791103	.614325	15.729	130	.000
I. Triage and basic first aid								
Q1. Performance of a rapid physical and mental assessment	.313	.646	.056	.425	.201	5.549	130	.000
Q2. Assisting with triage (START model)	.855	.954	.083	1.020	.690	10.260	130	.000
Q3. Basic first aid in a large-scale emergency event	.588	.743	.065	.716	.459	9.056	130	.000
II. Biological agent detection								
Q4. Recognition of relevant signs and symptoms	.847	.836	.073	.992	.703	11.595	130	.000
Q5. Modes of transmission	.809	.805	.070	.948	.670	11.506	130	.000
Q6. Appropriate antidote and prophylactic medicine	.824	.818	.071	.966	.683	11.537	130	.000
Q7. Possible adverse reactions/complications	.817	.811	.071	.957	.677	11.521	130	.000
Q8. Signs/symptoms of exposure to different biological agents	.840	.792	.069	.977	.703	12.128	130	.000
III. Accessing critical resources and reporting								
Q9. When to report an unusual set of symptoms […]	.794	.909	.079	.951	.637	9.995	130	.000
Q10. Knowledge of an Emergency Operation Plan (EOP)	.496	.695	.061	.616	.376	8.174	130	.000
Q11. Processes of the ICS	.557	.805	.070	.696	.418	7.919	130	.000
Q12. Agency preparedness information	.626	.788	.069	.762	.490	9.095	130	.000
Q13. The content of the EOP at UPMC	.634	.843	.074	.779	.488	8.601	130	.000
V. Isolation, quarantine, and decontamination								
Q14. Isolation procedure for persons	.786	.785	.069	.922	.651	11.471	130	.000
VI. Psychological Issues								
Q15. Signs/symptoms of posttraumatic […]	.611	.651	.057	.723	.498	10.732	130	.000
Q16. Appropriate psychosocial needs/resources for victims	.664	.781	.068	.799	.529	9.737	130	.000
Q17. Ability to discern and treat persons with comorbidities who are exposed to […]	.832	.756	.066	.963	.701	12.597	130	.000
VIII. Communication and connectivity								
Q18. Procedures for communicating critical patient information for transporting patients during a disaster	.756	.766	.067	.888	.623	11.299	130	.000
Pre_Sum-Post_Sum	12.649	9.204	.804	14.240	11.058	15.729	130	.000

Abbreviations: EPIQ, Emergency Preparedness Information Questionnaire; EOP, Emergency Operations Plan; ICS Incident Command System

Appendix B

Project Timeline



Appendix C

Results-Greatest Improvement

Q2 Triage and basic first aid: Assisting with triage (START model)

		Pre_Q2
N	Valid	131
	Missing	42
Mean		3.11
Median		3.00
Mode		3
Std. Deviation		.986
Minimum		1
Maximum		5
Sum		407

		Post_Q2
N	Valid	131
	Missing	42
Mean		3.96
Median		4.00
Mode		4
Std. Deviation		.637
Minimum		2
Maximum		5
Sum		519

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Appendix D

Results-Lowest Awareness

Q1 Triage and basic first aid: Performance of a rapid physical and mental assessment

		Pre_Q1
N	Valid	131
	Missing	42
Mean		3.83
Median		4.00
Mode		4
Std. Deviation		.597
Minimum		2
Maximum		5
Sum		502

		Post_Q1
N	Valid	131
	Missing	42
Mean		4.15
Median		4.00
Mode		4
Std. Deviation		.432
Minimum		3
Maximum		5
Sum		543

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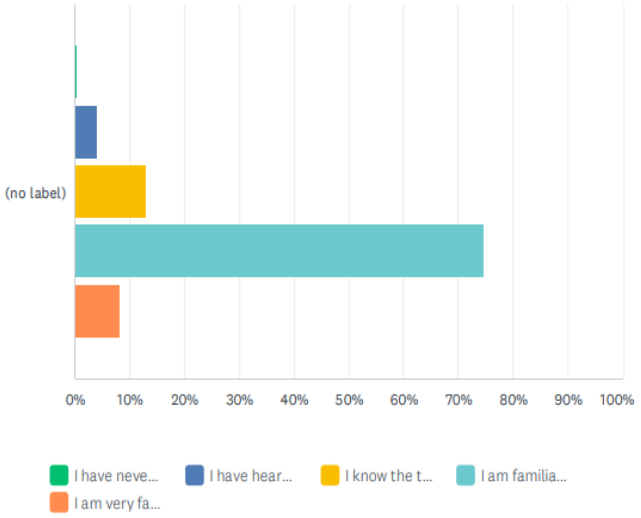
Appendix E

Sample EPIQ PRE- & POST Survey Question

Adapted Emergency Preparedness Information Questionnaire (EPIQ)

Q1 Triage and basic first aid: Performance of a rapid physical and mental assessment

Answered: 248 Skipped: 0

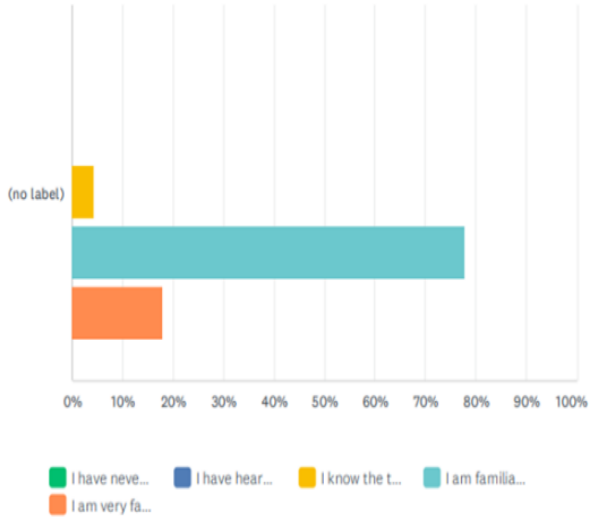


	I HAVE NEVER HEARD OF THIS TOPIC BEFORE.	I HAVE HEARD THE TERMINOLOGY BEFORE BUT HAVE NO KNOWLEDGE OF THIS INFORMATION.	I KNOW THE TERMINOLOGY BUT HAVE NO KNOWLEDGE OF THIS TOPIC.	I AM FAMILIAR WITH THIS TOPIC BUT NOT EXTREMELY PROFICIENT IN ALL SUBJECT MATTER.	I AM VERY FAMILIAR WITH THIS TOPIC; I AM AN EXPERT IN ALL PROFICIENCY ON THIS TOPIC.	TOTAL	WEIGHTED AVERAGE
(no label)	0.40% 1	4.03% 10	12.90% 32	74.60% 185	8.06% 20	248	3.86

Copy of Adapted Emergency Preparedness Information Questionnaire (EPIQ)-Post-Test

Q1 Triage and basic first aid: Performance of a rapid physical and mental assessment

Answered: 162 Skipped: 0



	I HAVE NEVER HEARD OF THIS TOPIC BEFORE.	I HAVE HEARD THE TERMINOLOGY BEFORE BUT HAVE NO KNOWLEDGE OF THIS INFORMATION.	I KNOW THE TERMINOLOGY BUT HAVE NO KNOWLEDGE OF THIS TOPIC.	I AM FAMILIAR WITH THIS TOPIC BUT NOT EXTREMELY PROFICIENT IN ALL SUBJECT MATTER.	I AM VERY FAMILIAR WITH THIS TOPIC; I AM AN EXPERT IN ALL PROFICIENCY ON THIS TOPIC.	TOTAL	WEIGHTED AVERAGE
(no label)	0.00% 0	0.00% 0	4.32% 7	77.78% 126	17.90% 29	162	4.14

Appendix F

Results

TABLE 2. Results: Statistical Analysis of Mean Improvement in Familiarity Scores of All 18 Question Within the 8 Core Competencies as Defined by the EPIQ on the Pre- and Posttest Surveys

Questions	Paired Differences					t	df	Significance (2-Tailed)
	Mean Familiarity Score Improvement	Standard Deviation	Standard Error Mean	98% Confidence Interval of the Difference				
				Lower	Upper			
Pre_Mean-Post_Mean	.702714	.511358	.044678	.791103	.614325	15.729	130	.000
I. Triage and basic first aid								
Q1. Performance of a rapid physical and mental assessment	.313	.646	.056	.425	.201	5.549	130	.000
Q2. Assisting with triage (START model)	.855	.954	.083	1.020	.690	10.260	130	.000
Q3. Basic first aid in a large-scale emergency event	.588	.743	.065	.716	.459	9.056	130	.000
II. Biological agent detection								
Q4. Recognition of relevant signs and symptoms	.847	.836	.073	.992	.703	11.595	130	.000
Q5. Modes of transmission	.809	.805	.070	.948	.670	11.506	130	.000
Q6. Appropriate antidote and prophylactic medicine	.824	.818	.071	.966	.683	11.537	130	.000
Q7. Possible adverse reactions/complications	.817	.811	.071	.957	.677	11.521	130	.000
Q8. Signs/symptoms of exposure to different biological agents	.840	.792	.069	.977	.703	12.128	130	.000

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Appendix G

Mean Improvement Familiarity

Results

TABLE 2. Results: Statistical Analysis of Mean Improvement in Familiarity Scores of All 18 Question Within the 8 Core Competencies as Defined by the EPIQ on the Pre- and Posttest Surveys

Questions	Paired Differences					t	df	Significance (2-Tailed)
	Mean Familiarity Score Improvement	Standard Deviation	Standard Error Mean	98% Confidence Interval of the Difference				
				Lower	Upper			
Q10. Knowledge of an Emergency Operation Plan (EOP)	.496	.695	.061	.616	.376	8.174	130	.000
Q11. Processes of the ICS	.557	.805	.070	.696	.418	7.919	130	.000
Q12. Agency preparedness information	.626	.788	.069	.762	.490	9.095	130	.000
Q13. The content of the EOP at UPMC	.634	.843	.074	.779	.488	8.601	130	.000
V. Isolation, quarantine, and decontamination								
Q14. Isolation procedure for persons	.786	.785	.069	.922	.651	11.471	130	.000
VI. Psychological Issues								
Q15. Signs/symptoms of posttraumatic [...]	.611	.651	.057	.723	.498	10.732	130	.000
Q16. Appropriate psychosocial needs/resources for victims	.664	.781	.068	.799	.529	9.737	130	.000
Q17. Ability to discern and treat persons with comorbidities whom are exposed to [...]	.832	.756	.066	.963	.701	12.597	130	.000
VIII. Communication and connectivity								
Q18. Procedures for communicating critical patient information for transporting patients during a disaster	.756	.766	.067	.888	.623	11.299	130	.000
Pre_Sum-Post_Sum	12.649	9.204	.804	14.240	11.058	15.729	130	.000

Abbreviations: EPIQ, Emergency Preparedness Information Questionnaire; EOP, Emergency Operations Plan; ICS Incident Command System

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Appendix H

Paired Samples t-test

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre_Q1	3.83	131	.597	.052
	Post_Q1	4.15	131	.432	.038
Pair 2	Pre_Q2	3.11	131	.986	.086
	Post_Q2	3.96	131	.637	.056
Pair 3	Pre_Q3	3.45	131	.787	.069
	Post_Q3	4.04	131	.546	.048
Pair 4	Pre_Q4	2.99	131	.770	.067
	Post_Q4	3.84	131	.552	.048
Pair 5	Pre_Q5	3.05	131	.778	.068
	Post_Q5	3.86	131	.565	.049
Pair 6	Pre_Q6	2.91	131	.759	.066
	Post_Q6	3.73	131	.666	.058
Pair 7	Pre_Q7	2.95	131	.778	.068
	Post_Q7	3.76	131	.593	.052
Pair 8	Pre_Q8	2.90	131	.763	.067
	Post_Q8	3.74	131	.589	.052
Pair 9	Pre_Q9	3.18	131	.957	.084
	Post_Q9	3.97	131	.632	.055
Pair 10	Pre_Q10	3.46	131	.806	.070
	Post_Q10	3.95	131	.524	.046
Pair 11	Pre_Q11	3.35	131	.936	.082
	Post_Q11	3.91	131	.561	.049
Pair 12	Pre_Q12	3.31	131	.927	.081
	Post_Q12	3.93	131	.557	.049
Pair 13	Pre_Q13	3.26	131	.949	.083
	Post_Q13	3.89	131	.558	.049
Pair 14	Pre_Q14	3.15	131	.745	.065
	Post_Q14	3.93	131	.543	.047
Pair 15	Pre_Q15	3.43	131	.691	.060
	Post_Q15	4.04	131	.502	.044
Pair 16	Pre_Q16	3.32	131	.705	.062
	Post_Q16	3.98	131	.540	.047
Pair 17	Pre_Q17	2.95	131	.783	.068
	Post_Q17	3.79	131	.633	.055
Pair 18	Pre_Q18	3.19	131	.833	.073
	Post_Q18	3.95	131	.586	.051
Pair 19	Pre_Mean	3.20992	131	.606951	.053030
	Post_Mean	3.91264	131	.447481	.039097
Pair 20	Pre_Sum	57.78	131	10.925	.955
	Post_Sum	70.43	131	8.055	.704