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THE IMPACT OF HURRICANE KATRINA ON THE NURSE ANESTHESIA
COMMUNITY IN NEW ORLEANS

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy at Virginia Commonwealth University.

by

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Abstract

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Virginia Commonwealth University, 2010

Director: Chuck Biddle, Ph.D.

Professor and Director of Research, Department of Nurse Anesthesia

Hurricane Katrina devastated New Orleans in 2005. Certified Registered Nurse Anesthetists (CRNAs) and Student Registered Nurse Anesthetists (SRNAs) were impacted by the storm. CRNAs were required to be on duty during the storm and SRNAs' education was disrupted by the storm. This dissertation is a compilation of three papers that represent the initial exploratory research into the impact of natural disasters on CRNAs and future CRNAs.

The first article was a focused ethnography utilizing focus groups and described the shared experiences of CRNAs who were on duty in New Orleans during Hurricane Katrina and the psychosocial impact the storm had on them. Ten CRNAs participated in focus groups that were audio-recorded, transcribed and analyzed. Six major themes

emerged from the study and represented how the CRNAs appraised and coped with the stressful events surrounding Hurricane Katrina. The psychosocial impact of Hurricane Katrina on the CRNAs resulted in short-term sleep disturbances and a temporary increase in alcohol consumption.

The second article was also a focused ethnography that utilized focus groups to describe the shared experiences of SRNAs whose senior year was disrupted by Hurricane Katrina and the psychosocial impact the storm had on them. Ten former SRNAs participated in focus groups that were audio-recorded, transcribed, and analyzed. Three major themes emerged from the study and represented how the SRNAs appraised and coped with the stressful events surrounding Hurricane Katrina. The psychosocial impact of Hurricane Katrina on the SRNAs resulted in temporary increased alcohol consumption and anxiety.

The third article discussed the results of an observational study regarding the impact of Hurricane Katrina on the outcome of the Self-Evaluation Exam (SEE) taken by senior-level students in the Louisiana State University Health Sciences Center Nurse Anesthesia Program. A convenience sample consisted of 174 former students. Regression analysis revealed the relationship between the overall percentile score of the SEE and the year the test was taken (prior to or after Hurricane Katrina) while adjusting for potential confounding variables. The findings suggest that Hurricane Katrina did not have an impact on the outcome of the SEE taken by these individuals.

CHAPTER 1: INTRODUCTION

On August 29, 2005, Hurricane Katrina devastated New Orleans and the gulf coast region. Hurricane Katrina was one of the deadliest and most costly hurricanes in the history of the United States (Kessler, Galea, Jones, & Parker, 2006, p. 930). Who could forget the television images of the flooding and of health care workers begging for the rescue of their patients and themselves? All hospitals and many businesses and institutions in New Orleans were damaged by flood waters, wind, loss of vital utilities, and looting. The mayor of New Orleans, C. Ray Nagin, called for an unprecedented mandatory evacuation of all non-essential personnel on August 28, 2005. Certified Registered Nurse Anesthetists (CRNAs) are considered essential personnel and were expected to report for duty in the hospitals during the storm. Student Registered Nurse Anesthetists (SRNAs) are not considered essential personnel but many were assigned to clinical duties in hospitals that were in the mandatory evacuation areas and volunteered to report for duty in the capacity of Registered Nurses (RNs). SRNAs who were attending the Louisiana State University Health Sciences (LSUHSC) School of Nursing, Nurse Anesthesia Program had their education disrupted due to Hurricane Katrina.

In the past, CRNAs who were on duty during storms were typically relieved no later than three days following the storm and usually, the very next day. Hurricane Katrina cut a devastating path through New Orleans and it was impossible to know when

the “on duty” CRNAs would get relief. When the patients and staff in the New Orleans Hospitals were finally rescued, the devastation of the healthcare infrastructure was incomprehensible (Berggren & Curiel, 2006).

Disasters are not unique to the city of New Orleans. No one could have predicted the magnitude of destruction caused by the events surrounding Hurricane Katrina. Several people mentioned, in personal conversations, that once the storm passed, they were able to move about the city and get to their homes or evacuate to another city. It was not until the levees collapsed and flooded the city that unprecedented massive destruction was realized. Prior to Hurricane Katrina, evacuations from the city of New Orleans were generally one to three days long and most people were able to return to their homes the day after a storm. Due to the unpredicted, severe magnitude of Hurricane Katrina, many residents were not allowed to return to their homes (or what was left of them) until October of 2005. The city infrastructure was severely damaged and basic resources such as water, electricity, and sanitation services were non-existent or very limited.

The Louisiana Superdome has been used in the past as a hurricane shelter for those unable or unwilling to leave the city. Resources (i.e. drinking water, potable water, sanitation, food) were quickly exhausted and civil unrest occurred. There was a delay in transportation of hurricane victims out of the city due to the unprecedented damage and flooding Hurricane Katrina and due to the lack of or inability of government agencies to communicate and coordinate the evacuations. Lessons learned during the Hurricane Katrina disaster allowed for a smoother evacuation of New Orleans during Hurricane Gustav in 2008. The lessons also impacted the availability of resources for disaster

victims. The Federal Emergency Management Agency mobilized resources, such as food and water, to staging areas near potential disaster areas in order to expedite relief after the disaster. Disasters can affect individuals, communities, and institutions. This investigation collectively addresses the impact of a disaster both on an individual basis and a community basis.

Louisiana State University Health Sciences Center (LSUHSC), where the medical and nursing schools are housed, received one to two feet of water (Smith, 2005). The LSUHSC Nurse Anesthesia Program (NAP) is housed in the nursing school portion of this center. A state of the art distance learning classroom, which was on the first floor of the LSUHSC, was left in complete ruin. This distance learning classroom was primarily used by the Nurse Anesthesia Program. Two weeks after the storm, a few faculty members were allowed to enter the building to retrieve materials necessary to continue with the semester courses. The first floor was covered with slime and the distance learning classroom was battered. Chairs and tables were overturned from floating in the water. The computer equipment had mold on it and was destroyed. It was apparent that LSUHSC would not be open for some time and that the education of the SRNAs would be disrupted by damage caused by Hurricane Katrina.

Senior-level (senior) SRNAs had less than nine months left in their training when the storm disrupted their education. Most students were concerned about completing their education on time. Many program directors from anesthesia schools across the country sent offers to finish educating the senior SRNAs. Not one senior student left the Nurse Anesthesia Program. Another pressing issue was that in their senior year, SRNAs are

required to take the Self Evaluation Exam (SEE), a national examination given by the National Board on Certification and Recertification of Nurse Anesthetists, in their senior year. The objectives of the SEE are: (1) to provide information to students about their progress in the nurse anesthesia program; (2) to provide information to program directors on how well their programs are preparing students with the knowledge they need for anesthesia practice; and (3) to prepare students for the Certification Examination experience (American Association of Nurse Anesthetists, 2008). Several senior SRNAs did not take their SEE until after Hurricane Katrina.

The International Hurricane Research Center has listed New Orleans as the most vulnerable city to hurricanes (International Hurricane Research Center, 2006). Louisiana and New Orleans are vulnerable to both hurricanes and tropical storms. In the last five years, Louisiana has been affected by five tropical storms and six hurricanes (Environmental Defense, n.d.). Of these eleven storms, five of them directly impacted New Orleans either moderately or severely. Natural disaster research in New Orleans is very limited and the field is fertile for systematic inquiry. Since this last report, New Orleans was affected by two more hurricanes in 2008. Disaster research opportunities will continue in New Orleans due to the fact that the city is vulnerable to natural disasters.

Disasters are catastrophic events that involve extensive loss of life and property and long-lasting disruption of communities and local resources (Taylor, 1989, p. 10). They can affect individuals, communities, and institutions. Currently, very little literature exists regarding the psychosocial impact of hurricanes/disasters on health care workers

and college students and no literature exists regarding the impact of hurricanes on Certified Registered Nurse Anesthetists (CRNAs) and Student Registered Nurse Anesthetists (SRNAs). Of the literature that does exist, a recurring theme is that disaster workers tend to develop some type of psychological response such as Post Traumatic Stress Disorder (PTSD) (Secor-Turner & O'Boyle, 2006, Chang et al. 2003). Inquiry into the literature revealed research related to primary and secondary school age children as well as volunteer health care workers who helped out in cities that experienced natural disasters. Missing in the literature are ethnographic accounts of CRNAs who were on duty during a hurricane as well as accounts of SRNAs whose education was interrupted by a hurricane.

This three-paper option provides systematic exploration into the experience of CRNAs and SRNAs during Hurricane Katrina. The focus of each paper is: (a) The shared experience of CRNAs who were on duty in New Orleans during Hurricane Katrina and the psychosocial impact the storm had on them, (b) The shared experience of SRNAs whose senior year was disrupted by Hurricane Katrina and the psychosocial impact the storm had on them, and (c) The impact of Hurricane Katrina on Self Evaluation Scores (SEE) of Senior SRNAs. The results of these studies have the potential to provide a basis for future disaster research and planning regarding CRNAs and SRNAs as well as other health care professionals and education programs.

Paper 1: The Shared Experience of CRNAs Who Were on Duty in
New Orleans during Hurricane Katrina

CRNAs are advanced practice registered nurses who specialize in the administration of anesthesia. They are considered essential personnel in the City of New Orleans and are required to report for duty during disasters. Typically, CRNAs who were on duty during a disaster could be expected to be relieved no later than three days after the disaster. Due to the mass devastation left in the wake of Hurricane Katrina, CRNAs did not know when and if they would be relieved. This study explored the shared experience of the CRNAs who were on duty in New Orleans during Hurricane Katrina as well as the psychosocial impact the storm had on them. Two research questions were examined in this study: (a) “What was the shared experience of CRNAs who were on duty in New Orleans during Hurricane Katrina?” and (b) “What psychosocial impact did Hurricane Katrina have on CRNAs who were on duty in New Orleans during Hurricane Katrina?”

A focused ethnography using semi-structured interviews in focus group settings was utilized to ascertain the shared experiences of the CRNAs who were on duty in New Orleans during Hurricane Katrina as well as the psychosocial impact the storm had on them. The focus group interviews were transcribed verbatim and analyzed using QSR International’s NVivo 8 software. Six major themes emerged from over one hundred pages of transcripts, co-facilitator notes, and investigator notes.

Paper II: The Shared Experience of SRNAs whose Senior Year
was Disrupted by Hurricane Katrina

SRNAs are students enrolled in an accredited nurse anesthesia program. Nationally, the length of anesthesia programs ranges from 24-36 months. Hurricane Katrina caused significant damage to the building which housed the LSUHSC NAP. No one knew when it would be safe to return to New Orleans and when the infrastructure would be repaired. Senior SRNAs were very concerned about graduating on schedule. Not one senior-level student left the LSUHSC Nurse Anesthesia Program. Some of the senior SRNAs volunteered to work in New Orleans hospitals during the storm as RNs and others were in clinical sites that were not affected by Hurricane Katrina. Many students continued the clinical portion of their education while waiting for classes to resume. This study explored the shared experience of SRNAs whose senior year was disrupted by Hurricane Katrina. Two research questions were addressed in this study: (a) “What was the shared experience of SRNAs whose senior year was disrupted by Hurricane Katrina?” and (b) “What was the psychosocial impact of Hurricane Katrina on SRNAs whose senior year was disrupted by Hurricane Katrina?”

A focused ethnography using semi-structured interviews in focus group settings was utilized to ascertain the shared experiences of SRNAs whose senior year was disrupted by Hurricane Katrina as well as the psychosocial impact the storm had on them. The focus group interviews were transcribed verbatim and analyzed using QSR International’s NVivo 8 software. Three major themes emerged from over seventy pages of transcripts, co-facilitator notes, and investigator notes.

Paper III: Did Hurricane Katrina have an impact on Self Evaluation Exam scores of senior-level students in the Louisiana State University Health Sciences Center School of Nursing Nurse Anesthesia Program?

The Self Evaluation Exam (SEE) is a standardized test written by the National Board on Certification and Recertification of Nurse Anesthetists (NBCRNA) formerly known as the Council on Certification of Nurse Anesthetists. The purpose of the test is to allow the student as well as program faculty to determine strengths and weaknesses in multiple areas of anesthesia content. The LSUHSC nurse anesthesia program requires all senior-level students to take the SEE. In the graduating class of 2006, four senior students took the test prior to Hurricane Katrina and 31 students took it after the storm. The purpose of this study was to determine if the storm had an impact of the scores of the Self Evaluation Exam.

The research question is “Did Hurricane Katrina have an impact on the SEE scores of senior-level students in the LSUHSC Nurse Anesthesia Program?” The hypothesis is: Senior-level students who took the SEE exam after Hurricane Katrina scored significantly lower on the exam than senior-level students who took the exam prior to Hurricane Katrina.

A non-experimental observational research design was used because the investigation took place after the event (Hurricane Katrina) and the investigator had no control over the manipulation of variables or the sample groups. Regression analysis was used to describe a relationship between the overall percentile score of the SEE and the year the test was taken (prior to or after Hurricane Katrina) while adjusting for potential

confounding variables. Age, gender, length of time in program at the time of the SEE, Bachelor of Science in Nursing (BSN) grade point average (GPA), and Graduate Record Exam (GRE) Score/ Miller Analogy Test (MAT) score were the potential confounding variables used.

These three papers represent initial exploratory research into the impact of natural disasters on Certified Registered Nurse Anesthetists and future Certified Registered Nurse Anesthetists. This investigation represented just one level of impact of a disaster, individual, and the results may be useful for future disaster planning and future investigative inquiry into the impact of disasters on individuals.

CHAPTER 2

The Shared Experience of CRNAs Who Were on Duty in New Orleans during Hurricane Katrina

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Abstract

The purpose of this focused ethnography was to describe the shared experiences of Certified Registered Nurse Anesthetists (CRNAs) who were on duty in New Orleans during Hurricane Katrina as well as to elucidate the psychosocial impact the storm had on them. Ten CRNAs participated in one of three focus groups that were audio-recorded. The audio recordings were then transcribed and analyzed using NVivo 8 computer software. Six major themes emerged from the study: caught off guard; sense of duty; uncertainty/powerlessness/frustration; group identity and cohesiveness; anger; and life-changing event. The themes represented how the CRNAs appraised and coped with the stressful events surrounding Hurricane Katrina. The psychosocial impact of Hurricane Katrina on the CRNAs mainly resulted in short-term sleep disturbances and increased drinking. Only two CRNAs expressed long-term psychosocial effects from the storm. The results of this study should be used to guide policies regarding disaster activation of CRNAs, to educate CRNAs on disaster duty preparation, and to provide a framework for future disaster studies regarding CRNAs.

Key Words:

Hurricane Katrina; CRNAs, Focused ethnography

Introduction

Hurricane Katrina, which hit New Orleans as a category three storm, was one of the most devastating natural disasters in the history of the United States. The storm damaged all hospitals in New Orleans and closed several of them permanently. The mayor of New Orleans called for an unprecedented mandatory evacuation of all non-essential personnel on August 28, 2005. Certified Registered Nurse Anesthetists (CRNAs) were considered essential personnel in the hospitals and were required to report for duty during disasters.

In the event of tropical storms and hurricanes, New Orleans hospitals had staffing policies in place. Most hospitals used activation/duty teams which were expected to report for duty just before a storm with provisions and clothing for approximately three days. Provisions included non-perishable food and water. The hospitals also utilized recovery teams which were expected to relieve the activation team within three days after a storm. In the past, CRNAs who were on duty during storms were typically relieved the day after a storm. However, the wide-spread flooding and closure of roads in the city in the aftermath of Hurricane Katrina made relief of the activation team impossible. When the patients and staff in the New Orleans hospitals were finally rescued, the devastation of the healthcare infrastructure was incomprehensible. ¹

Conditions in the hospitals deteriorated when the infrastructure declined and electricity and potable water were lost. Back-up generators failed once the flood waters seeped into the basements and first floors of the hospitals, which left the patients and hospital staff in a vulnerable situation. Basic necessities such as food and water were

rationed². Rescue and evacuation efforts were hindered by random acts of violence as well as by street flooding. The two indigent hospitals in New Orleans were the last to be evacuated. Several employees of the indigent hospitals recalled that they were glad to be rescued, but frightened for their lives, because of the total chaos that was occurring in the city (e.g. looting and gunfire).

Although disaster literature exists pertaining to victims and rescue workers, an extensive review of the literature failed to reveal research regarding CRNAs and disasters. This study describes the shared experiences of CRNAs who were on duty in New Orleans during Hurricane Katrina.

Materials and Methods

This study was a focused ethnography utilizing group interviews to determine a) the shared experience of CRNAs who were on duty in New Orleans during Hurricane Katrina and b) the psychosocial impact Hurricane Katrina had on CRNAs who were on duty in New Orleans during the storm. The protocol was approved by the Institutional Review Boards from Virginia Commonwealth University and Louisiana State University Health Sciences Center, and appropriate consents were obtained from all participants.

Focused ethnography describes a specific aspect of a culture and is generally conducted by someone familiar with the culture, and, therefore, fieldwork may not be warranted.^{3,4} Focused ethnography differs from traditional ethnography in that traditional ethnography includes extensive fieldwork (immersion of the investigator into the culture being investigated) by an investigator unfamiliar with the culture and lasts from months to years. The investigator was familiar with most of the CRNAs who were on duty in

New Orleans during Hurricane Katrina and field work was not feasible for this study because the event (Hurricane Katrina) has passed. The culture in this study was the group of CRNAs who were on duty in any of the nine urban hospitals in New Orleans on August 29, 2005, during Hurricane Katrina. Culture can be described as a “persistent group pattern of behaviors, beliefs, norms, attitudes, and behaviors”.^{4(p21)} In an appropriately conducted focused ethnography, the relatively small sample size is offset by the in-depth information provided regarding the phenomenon under study.⁵

A convenience sample of ten participants representing six of the nine urban hospitals in New Orleans participated in one of three focus groups. There were approximately seventeen CRNAs on duty in New Orleans during Hurricane Katrina. The investigator personally knew fourteen of these CRNAs and was able to contact them via e-mail and invite them to participate in the study. The contact information for the other three CRNAs was not available to the investigator. Prior to the focus group interview, the participants were asked to fill out a demographic survey and the results were analyzed using the Statistical Package for the Social Sciences (SPSS) computer software (SPSS Inc, Chicago, Illinois). The age range of the participants was from less than thirty-five years old to greater than fifty-five years old. The majority of the participants were in the 35-54 year old age range. Seven of the participants were male and 8 were Caucasian. The number of years experience as a CRNA ranged from less than 5 years to greater than 20 years with four of the participants having 5-10 years, and three having 16-20 years experience. Four of the participants were employed less than 5 years, three employed 5-10 years and three employed greater than 10 years by the hospital in which they were

activated for storm duty. The number of times the participants were activated for storm duty prior to Hurricane Katrina ranged from 0-5 with seven of them being on duty two or more times. The participants experienced property damage ranging from \$5000.00 to \$500,000.00. At least four of the participants experienced property damage greater than \$100,000.00. Two participants did not give a dollar amount but did report “total damage” with regard to property damage. The sample demographics appear in Table 1.

Focus group interviews took place in a quiet conference room with a co-facilitator who was an experienced focus group researcher and who recorded notes and the non-verbal cues of the participants. The co-facilitator was introduced to the participants and her role was explained to them. The investigator utilized an interview guide consisting of a predetermined set of semi-structured questions, follow-up questions, and probes based on the Lazarus and Folkman stress, appraisal, and coping model to facilitate the interviews.⁶ The interviews were audio-recorded, transcribed verbatim, and checked for accuracy by reading the transcripts while listening to the audio recordings. The investigator analyzed the resulting transcripts for codes, patterns, and emerging themes using NVivo 8 computer software (QSR International, Melbourne, Australia). NVivo 8 is a computer software package designed to facilitate qualitative data analysis by allowing the investigator to import and analyze transcripts, photos, videos, and other documents electronically. The package is inherently easy to navigate and utilizes toolbars and tasks similar to Word.

Results

The purpose of this study was to describe the shared experiences of CRNAs who were on duty in New Orleans during Hurricane Katrina, to examine the psychosocial impact that Hurricane Katrina had on them, and to analyze emerging themes based on their focus group interviews. Six major themes emerged from over one hundred pages of transcripts, co-facilitator notes, and investigator notes. The major themes are depicted in Table 2.

Caught off guard. The participants were caught off guard by many aspects of Hurricane Katrina including the course of the storm, preparation for the storm, and magnitude of the storm. First of all, Hurricane Katrina was not initially forecast to directly impact New Orleans. The media reported that the hurricane was heading east of Louisiana, but most of the CRNAs paid little attention to the storm until a few days before it hit the city. One CRNA stated “*It was the perfect storm because it didn't really give us a whole lot of time to do a lot of preparing.*” A few of them related that they were not in the city when they were activated for storm duty. One CRNA recalled being in Alexandria, which is approximately 200 miles north and west of New Orleans:

I was doing a 40-50 mile ride with some friends and my phone was incessantly ringing. I had my cell phone with me and finally I was annoyed enough that I pulled over and answered it and it was, uh... it was [the hospital] and they said, ‘You've drawn the short straw, you're on hurricane duty.’ I'm like, what hurricane are you referring to? Like, ‘There's a hurricane gonna hit. You need to be at the hospital at 0800 tomorrow morning.’ So, uh, we finished our ride, uh, got back to my father's home and threw everything in my truck and... and drove into the city.

Another aspect in which the CRNAs were caught off guard was in preparation for the storm. Most participants reported they were able to prepare, at least minimally, their

homes for the storm. They boarded the windows, covered their furniture, moved valuable items to higher areas to avoid potential flooding, removed perishable items, and threw pool/patio furniture into the pool. Some CRNAs reported that they were unable to prepare their homes for the storm because of lack of time or materials.

Many hospitals in New Orleans had lax rules regarding evacuation of family members to the hospital for protection during storms. One participant reported that his whole family planned to evacuate to the hospital with him, but because of the magnitude of the storm, everyone left the city except for his daughter who evacuated to the hospital with him. Another participant recalled that he and his wife missed the window of opportunity to evacuate from the city; therefore, he volunteered for storm duty and he brought his wife and dog to the hospital with him. The rest of the participants reported that their family members evacuated prior to their reporting to duty. The participants who discussed taking their family members to the hospital during Hurricane Katrina stated they would *never* do this again. One CRNA said,

I won't do it with my wife again. She's not medical...and some of the patients had expired, you know, they hadn't made it through the thing... she was a little freaked out by it. And it was just too much. It was just too much having a family member with me.

Most hospitals in New Orleans now no longer allow family members or pets to accompany activated personnel.

Previously, storm duty mainly consisted of an overnight commitment with the CRNA usually going home the very next day. Hurricane Katrina prevented CRNAs from being relieved of their duty, so they were forced to remain in the hospitals for several days despite a lack of resources and a crumbling infrastructure. Most CRNAs recollected

they were able to bring provisions to the hospital, but none of them brought more than a few days' worth of food, water, and clothing. They recalled that food was running out in their institutions and that they ended up sharing the absconded contents of vandalized vending machines along with food from lockers. They recounted that drinking water, albeit warm and unpleasant, was available, and the CRNAs tried to stay hydrated. Potable water was non-existent in many institutions, and some participants “*ended up using IV fluids and sterile water to take sponge baths with.*” One person reported having to recycle clothing because he only brought three days worth of clothing and was not able to leave the hospital for more than five days. He stated these were “*definitely desperate circumstances.*”

The magnitude of Hurricane Katrina caught them off guard as well. The participants reported to duty and expected the storm to be the same as previous storms. They recalled that the activities of the first part of storm duty were similar to previous storm duty experiences and regular work days. They checked and prepared operating rooms for emergency surgeries and also prepared alternate areas for delivery of anesthesia in case the operating rooms were unable to be used. One CRNA recalled helping to evacuate a few patients from the hospital, especially the premature babies. Once the preparations were complete and duty assignments made, a more relaxed atmosphere prevailed. “*So the hours that we weren't on duty, just like everybody else, you know, we sat around and played cards and... generally had a good time,*” recounted one participant. Another recalled that “*the first night ...there were the CRNAs and the ICU*

[Intensive Care Unit] personnel, we all just kind of stuck together and it was just... it was a jovial time because it was we're going home tomorrow, let's just have some fun."

As the night progressed, however, the weather became severe. One participant noted: *"so it was okay until that night when the wind really started to pick up."* Several participants described the wind being so severe that the windows began *"busting out."* Another participant pointed out the severity of the wind: *"We watched the roof of the superdome blow off."* The CRNAs recalled the severity of the rain as well: *"The rain was overwhelming [and] coming through the windows that [began to] burst...on the 12th level...the water was just flying in and pouring in."*

Sense of duty. All participants stressed the importance of having a CRNA on duty during a storm/hurricane to provide anesthesia for emergency surgery as well as obstetric cases. Their thoughts regarding activation for the storm ranged from excitement, to volunteerism, to *"no problem."* A CRNA who had never been activated before described, *"Personally, I was excited...I felt it was my duty. And I felt good about coming here to be part of that support team."*

They described worsening conditions in the hospitals after Hurricane Katrina passed through New Orleans, and the levees broke and flooded the city. The CRNAs reported that basic necessities were dwindling, and supply vehicles were hijacked by looters, therefore, making evacuation of patients a priority. They helped take patients to rooftops to be evacuated by helicopter and to emergency room ramps to be evacuated by boat. At one hospital, the only way to get the patients evacuated was to pass them through a hole in the boiler room wall on a make-shift gurney and load them on pick-up truck

beds for transportation to the roof. One of the participants helped pass patients through the hole. At some institutions, the CRNAs helped carry patients up several flights of stairs to the rooftop to be evacuated by helicopter. Several times they carried patients to the rooftop only to be told that there was not enough room in the helicopters for all of them, and the patients had to be carried back down. At other institutions, CRNAs helped carry patients down several flights of stairs on mattresses to be rescued by boats. As noted by one participant:

We had one lady that was... oh, I'd say she was close to 400 pounds and we put her on a mattress and we had to... and she was intubated, so... but she was awake. She was wide awake and she was aware of what we were doing and we said, Okay, the boat's coming to get her, and so we put her on a mattress and we pulled her downstairs... and I'm bagging her. And you could see the fear in her eyes... she was so big and there was like nine of us on each side trying to get her down the staircase, so I was... I told her, I said, listen, you know what you need, you just bag yourself until we can get you downstairs, and she did. She bagged herself. And so when we get down there, then they said, 'Oh, we can't take her on this boat. We need a flat boat.' So here it is. I was like well, there's no way in the world we can get this lady back up the stairs, so we stayed with her ... while a boat came to pick her up.

One CRNA began to weep when talking about rescuing patients because some of them were just too weak or sick to be rescued so they died. Several participants mentioned that they had to deal with dead bodies in the hospital: *"We had two deaths... that bothered me a lot because we took that body across the street to the garage and left it there, because our morgue was in the basement, and it was flooded, and I thought, my God, here it is somebody's family member"* and *"When did I become in charge of the dead bodies?"* was the reply of one CRNA when he was asked where to place the dead bodies from the morgue.

Uncertainty/powerlessness/frustration. The participants shared their uncertainty, powerlessness, and frustration regarding the safety of their families, their own safety, lack of communication, rumors in the city, and rescue/evacuation from the hospital. Most of the CRNAs knew their family members had evacuated and were probably all right, but a few mentioned concern of not being able to communicate with their family, and one CRNA mentioned “*my most troubling things were, one, not knowing where my mother was.*” Another CRNA recalled “*a few people were a little bit concerned about their families because the families had left the city and some of them were here alone, so there was a little bit more concern.*” Two participants, who had family members with them during the storm, described their constant worry about the family member’s well being and safety while they were on duty. Patients and their family members became irritable and intolerant of hospital conditions and vandalized portions of the hospital which, some CRNAs mentioned, made them feel unsafe. Most of the participants reported that they heard gunshots nearby during their time on duty which caused further uncertainty/powerlessness about their safety.

The CRNAs described a sense of panic arising in their institutions as the city became flooded, and people flocked to the hospitals for help. One participant said “*I saw panic set in real fast as the neighborhood came inside the building and all of a sudden we went from... I don't know...from 300 to 500 to 600 to... and that's when you started to [think], something's wrong.*” As people started converging on the hospitals, the participants expressed a fear for their safety. Others expressed a feeling of powerlessness regarding people being turned away from the hospitals because they wanted somehow to

help them. They described people wading through the water with babies in plastic containers being sent away from the hospital.

The participants expressed uncertainty and powerlessness regarding communication. One participant expressed: *“The world of communication that you are used to all of a sudden just ceased and no longer existed...you could not communicate with anyone.”* The CRNAs commented that cell phone service was erratic, but some of them were able to communicate with family members via text messaging until the cell phone batteries were depleted. Almost all of them stated they did not know that text messaging was available on their phones and that they did not know how to use the service prior to Hurricane Katrina. According to the participants, other forms of communication existed, such as portable radios, televisions, and rumors. People would gather and listen to or view the debacle that was occurring in the city. One participant noted:

I remember the most poignant moment in the entire Katrina event...the Mayor came on the radio and said ‘If you have the wherewithal to get out of the city, get out now. The levees have failed and we are flooding’ ...and then after that... everybody started, a sense of panic in that you knew there was doom occurring.

Rumors regarding rapes, robberies, and killings in the Superdome and Convention Center caused anxiety among the activation teams. Listening to the rumors caused a *“growing concern...then you start getting into these terms like, Oh, this is Biblical.”* One participant recalled thinking *“How long is it gonna be with the drug problem that this city has before these people come to the hospital to start getting their drugs, looking for drugs, because this is the place to get them.”*

As stated by one of the participants, *“It was a scary time 'cause, right, the cell phones were sketchy at best and, uh, it, uh...you know, as time went on and we're starting to go, well, how are we gonna get out of here?”* Most of the CRNAs were told on a daily basis that they would be rescued. They relayed that they would go to the staging areas only to find out they would not be leaving that day for reasons such as looters were shooting at the rescue boats. The participants expressed uncertainty/powerlessness regarding their rescue. One person recalled:

And they kept telling us everyday, we're going to be evacuating today. It didn't happen for five days. Everyday they'd tell us today, and it didn't happen, you know, until five days later. We made, we created large signs for the people in the helicopters to see that we needed rescuing and everything. You know, just pleading to be rescued.

A group of CRNAs from one of the indigent care hospitals was transported to a portion of Interstate-10 where many people in the city were waiting to be rescued. The CRNAs recalled seeing them on the interstate for days in the hot sun just waiting to be rescued, and how *“pitiful”* their conditions were. They expressed feeling powerless and frustrated *“cause now we were part of everyone, the thousands of people that were stranded all along [Interstate]-10 and walking around in a daze...coming up to us, asking us for help. We needed help ourselves.”* Another participant in the group expressed *“and all the people...most of us had scrubs on, so they thought we were there to help, but we were in the same boat as them.”* He further stated *“so for the hour or two we sat there, it was...it was pretty frightening to be out there.”*

Group identity and cohesiveness. The participants tended to remain in groups for safety and protection both while they were on duty and during their rescue and

evacuation. They reported that they even slept in the same rooms: “*We slept in like one room with three beds,*” and “*we had our little room in OB, our break room, which was good because we felt secure. We were kind of on a dead end; at least we could lock the door when we were in there.*” Group bonding and cohesiveness were mentioned when evacuation was discussed: “*there were five of us together, we made a deal, that if one of us gets out, we all get out.*” One participant shared: “*and then once all the patients left, the remaining people, we formed a caravan and left the hospital.*” Another participant mentioned,

The few anesthesia people, and we picked up a cardiology resident and kinda befriended him as well. And we said let’s all go get in our cars and stick together and see if we indeed can get out of here. We had no communication. You don’t know which way to go.

The participants identified themselves as “anesthesia,” and other health care workers in the hospital were identified by the area they worked in such as the Intensive Care Unit (ICU) or Trauma Intensive Care Unit (TICU) nurses.

Anger. Many of the participants expressed anger regarding the allowance of too many patients and their family members to evacuate to the hospitals as well as the inability to evacuate the hospitals. One CRNA noted:

And I think it was mostly a problem...they allowed a lot of family members to stay I was in OB and the family members were starting to be a problem, you know, so I know they had a bunch of family that was in the waiting area and they broke glass, they threw chairs through because they were getting angry. You couldn't walk around with a bottle of water or food because you might get, you know, mugged for it or whatever. I mean there was a lot of anger.

One participant expressed *“there were too many people here...when everything went wrong when the water came up, why didn't they just come get us? What was the problem? I don't understand the delay there.”* Another declared:

I was shocked by the way our government handled things that I thought not here in the United States would they let us sit and rot all this time, that somebody would come and get us, you know, they would do that anywhere else. Why would they...you know, 45 minutes from here...30 minutes from where we were, they were having... you know, they were going about their normal day. I just couldn't understand it. I still don't.

Several CRNAs expressed anger at the government's inability to rescue the people on the interstates. They also expressed disappointment that the government did not even use the window of opportunity to rescue people in the city prior to the levees breaking. One stated *“there was calm before...there was a period where if we had been on our toes that people could have got out of here.”* Another expressed *“we can ship, you know, hundreds of thousands of soldiers and military equipment to other countries, but we couldn't get a bus to come and pick people up off the interstate.”*

Participants frequently expressed anger toward the looters. One participant recalled *“they had a gunshot wound on Monday night...I'm thinking here it is, we're in a crisis and you're out there stealing and now you are shot up and I'm having to take care of you.”* They also expressed anger at the snipers who were shooting at rescue vehicles. As one CRNA recalled *“That storm brought out the worst in a lot of people.”*

Life-changing event. None of the participants reported losing a family member or pet because of Hurricane Katrina. They described the damage to their homes as ranging from tree damage to total loss. They also conveyed that four years after the storm, lives and events are talked about in terms of Pre-Katrina and Post-Katrina. Several

participants discussed how much more they appreciate the little things in life since the storm. One CRNA noted:

I ... appreciate more about life. Appreciate the little things in life and the real value of what material things mean in life because I lost everything, so...until you go through that, you don't realize you really can do without a lot of stuff, so...it changed me, I think, in a better way because I don't value that stuff as much as I used to.

Other participants shook their head and spoke in agreement to this statement. Another participant expressed that: *“It puts the meaning of living into perspective for me...what is life all about ... and at a drop of a hat it can be taken away from you...so you learn to value the people that are in your life.”*

Psychosocial impact of Hurricane Katrina. One aim of this study was to examine the psychosocial impact of Hurricane Katrina on the CRNAs who were on duty in New Orleans. Although the participants did not spend much time discussing this aspect of their shared experience, the emergent themes described their psychosocial state and responses. Most of them denied having long-term psychosocial effects from the storm, although one participant reported developing an anxiety disorder which required medication to control. The participant stated *“I started having horrible anxiety particularly at work...I would be doing an induction and start shaking uncontrollably and think I was going to die...I thought I was going to have to quit my job.”* Another participant revealed a long-term effect as the inability to sleep in the dark and the need to use a nightlight. This participant described that *“I have to have a nightlight where I can see...I can see around the room. Because we had people to come in our room, people that...you wake up and somebody's standing over you.”*

Several CRNAs discussed having short-term psychosocial effects from Hurricane Katrina. The most common short-term effect they reported was the inability to sleep. One person explained *“I didn’t sleep for about a week. I just kept seeing everyone’s face that I put on a bus.”* Another person described seeing flashlights at night while trying to sleep. The participant went on to explain: *“that’s how we would get woken up, if somebody needed us it would be the flashlight on you, you would see a flashlight and they would put it on their face, that way you would know who it was.”* Several participants discussed drinking alcohol for a while after the storm. One participant described that *“I took to drinking [alcohol] everyday for several weeks. I had to go back to work, so I couldn’t sustain that.”* Another participant stated *“we drank [alcohol] a good bit...I sat on the porch and drank bourbon with my grandfather in the evenings...for six weeks.”*

The world ceased to exist as usual to the CRNAs who felt they were frozen in time. The hospitals were like being stranded on isolated islands for them. These islands initially provided safety and shelter, but also limited outside communication. As the days passed, these islands became dangerous. The infrastructure failed; outsiders began to invade the island; outside communication became non-existent, and rescue from the island seemed implausible. While on the island, the CRNAs formed “three musketeers’ pacts” (all for one and one for all) with other CRNAs and health care workers. They were finally able to leave the islands behind and seek safety. Some of the islands disintegrated and others were temporarily uninhabitable. In all, few CRNAs were left with long-term sequelae and several suffered short-term sequelae from their island adventures.

Discussion

This focused ethnography described the shared experiences of CRNAs who were on duty during Hurricane Katrina as well as elucidated the psychosocial impact the storm had on them. This study was based on the stress, appraisal, and coping theory of Lazarus & Folkman which describes stress as a transactional relationship between a person and the environment and emphasizes the individual's cognitive appraisal of the event as well as the individual's response (coping) to the event.^{6,7} For this study, the cultural environment of being a CRNA on duty during Katrina produced a template for the participants to frame their shared, stressful experiences. The theoretical framework is illustrated in Figure 1.

The unexpected magnitude of Hurricane Katrina and the urgency surrounding the unprecedented mandatory evacuation of the city of New Orleans contributed to the initial shared stress prior to the storm's arrival. The lack of communication outside of the hospitals, the uncertainty of the status of family members and homes, the dwindling resources and crumbling infrastructure, and the lack of coordinated rescue efforts of patients and health care workers led to shared stressors during and after Hurricane Katrina devastated New Orleans.

Most of the CRNAs appraised the hurricane as a potential serious threat and responded by securing their homes as best as they could and by having their families and pets evacuate from the city. During and immediately after the storm the CRNAs realized they were experiencing a crisis when they appraised a lack of communication outside of

the hospitals, dwindling resources within the hospitals, and a lack of coordinated rescue and evacuation attempts of patients and health care workers from the hospitals.

During and immediately after the storm, several participants shared that they coped by going on the rooftops of their institutions to enjoy the sunlight, the stars, or the clear air. They also shared that they utilized available resources to remain hydrated, fed, and clean and that they remained in groups for safety reasons. Most of the participants engaged in the evacuation of patients from the hospitals and once the patients were rescued, they took a proactive role in evacuating themselves and other health care workers. After they were rescued or evacuated, the participants coped in different ways. Several participants experienced short-term sleep disturbances and increased alcohol consumption. Some participants exhibited downward social comparison, that is, they expressed that they did not suffer as much as other people who experienced the same event. Other forms of coping shared by the participants involved simplifying their lives by devaluing material things, concentrating on nurturing relationships, and measuring their lives as pre-Katrina and post-Katrina states.

The authors of an interpretive phenomenology of the experiences of perinatal nurses who worked in the New Orleans area during Hurricane Katrina revealed the major themes of their study as duty to care, conflicts in duty, chaos after the storm, strength to endure, grief, anger, and feeling right again.⁸ This study shared two of their major themes, duty and anger. Several studies conducted on health care workers who worked during disasters revealed a sense of duty as the major finding.⁹⁻¹² The psychosocial findings of this study were consistent with similar studies regarding health care workers and stress.

Psychosocial sequelae of health care workers following disasters may include stress, anxiety, depression, sleep disturbance, post-traumatic stress disorder (PTSD), somatic complaints, stress-related physical symptoms, fear, shock, and excessive alcohol use.¹³⁻¹⁶ Most symptoms disappear with time and without professional intervention of mental health personnel.¹⁷ Many of the participants in this study experienced anxiety and/or sleep disorders that resolved over time without professional intervention.

Several limitations existed in this research. First, the study took place four years after the storm. Another limitation is that convenience sampling was used and the results of the study may not be transferable except to other CRNAs who experience hurricanes. A third limitation was that CRNA experiences may not have been similar based on the type of institution in which they worked. Ten out of a potential of 17 people participated in this study and while the participation rate was 58%, the study may have been biased toward those who wished to tell their stories.

An implication of this study for CRNA practice includes developing storm duty policies based on the findings. These policies should address exactly how many CRNAs should be on duty and what provisions the duty CRNAs should bring to the hospital. Another implication of this study consists of educating CRNAs and future CRNAs in the preparation and expectations of disaster duty. They should be educated as to their specific role during disaster duty. They should also be notified as to how long they can expect to remain on duty during a disaster and potential evacuation and/or rescue plans. A final implication of this study includes conducting future research based on different types of

natural disasters, such as tornadoes, earthquakes, volcanic eruptions, and flooding, and their impact on CRNAs.

CRNAs were caught off guard by Hurricane Katrina yet they still shared a sense of duty when they were activated for the storm. They faced uncertainty and powerlessness, and expressed anger at situations revolving around the storm and the institutions. However, they also experienced group identity and cohesiveness throughout their tenure on storm duty. Hurricane Katrina was a life-changing event for those who experienced it as these participants did. This was the first study examining CRNAs with respect to natural disasters and significant insight was gained as to the impact of a natural disaster on a CRNA community.

References

1. Berggren RE, Curiel TJ. After the storm- health care infrastructure in post-Katrina New Orleans. *N Engl J Med.* 2006;354(15):1549-1552.
2. Van Meter K. Katrina at Charity Hospital: Much ado about something. *Am J Med Sci.* 2006; 332(5):251-254.
3. Knoblauch H. Focused Ethnography. <http://www.qualitative-research.net/fqs-texte/3-05/05-3-44-e.htm>. Accessed April 23, 2008.
4. Lecompte MD, Schensul JJ. *Designing & Conducting Ethnographic Research.* Walnut Creek, Ca: Sage Publications;1999.
5. Creswell JW, Plano Clark VL. *Designing and conducting mixed methods research.* Thousand Oaks, CA: Sage Publications;2007.
6. Lazarus RS, Folkman S. *Stress, appraisal, and coping.* New York, NY: Springer Publishing Company;1984.
7. Mathieu MM , Ivanoff A. Using Stress, Appraisal, and Coping Theories in Clinical Practice: Assessments of Coping Strategies After Disasters. *Brief Treatment Crisis Intervent.* 2006;6(4): 337-348.
8. Giarratano G, Orlando S, Savage J. Perinatal nursing in uncertain times the Katrina Effect. *MCN Am J Matern Child Nurs.* 2008;33(4):249-257.

9. Qureshi KA, Merrill JA, Gershon RR, Calero-Breckheimer A. Emergency preparedness training for public health nurses: A pilot study. *J Urban Health*. 2002;79(3):413-416.
10. Chaffee MW. Making the decision to report to work in a disaster. *Am J Nurs*. 2006;106(9):54-57.
11. French ED, Sole ML, Byers JF. A comparison of nurses' needs/concerns and hospital disaster plans following Florida's Hurricane Floyd. *J Emerg Nurs*. 2002;28(2):111-117.
12. Smith E. Emergency health care workers' willingness to work during major emergencies and disasters. *Aust J Emerg Manage*. (2007);22(2):21-24.
13. Gray MJ, Maguen S, Litz BT. Acute psychological impact of disaster and large-scale trauma: Limitations of traditional interventions and future practice Recommendations. *Prehosp Disaster Med*. 2004;19(1):64-72.
14. Leon GR. Overview of the psychosocial impact of disasters. *Prehosp Disaster Med*. 2004;19(1):4-9.
15. Mitchell AM, Sakraida TJ, Zalice KK. Disaster care: Psychological considerations. *Nurs Clin North Am*. 2005;40(2):535-550.
16. North CS, Tivis L, McMillen JC, et al. Psychiatric disorders in rescue workers after the Oklahoma City bombing. *Am J Psychiatry*. 2002;159(5):857-859.
17. Ursano RJ. Post-traumatic stress disorder. *N Engl J Med*. 2002;346(2):130-131.

Table 1. Sample Description^a numbers do not add to the n of 10 because of incomplete responses

CRNAs n=10	
Age (years)	
<35	1
35-44	3
45-54	5
>55	1
Gender	
Female	3
Male	7
Race	
African American	2
Caucasian	8
Years experience	
<5	1
5-10	4
11-15	1
16-20	3
>20	1
Years at duty hospital	
<5	4
5-10	3
11-15	1
16-20	1
>20	1
Number of times on duty prior to Hurricane Katrina	
0	1
1	2
2	4
3	2
5	1
Property damage due to Hurricane Katrina (\$) ^a	
<5000.00	1
10,000-25000	2
25,000-50,000	1
100,000-200,000	2
300,000-500,000	2
Legend: Years experience, the number of years working as a CRNA; Years at duty hospital, the number of years employed by the hospital where the CRNA was on duty during Hurricane Katrina; Number of times on duty prior to Hurricane Katrina, number of times the CRNA was activated for storm duty prior to Hurricane Katrina	

Table 2. Major themes of study

Theme	Descriptors
Caught off guard	Course of storm, preparation for storm, magnitude of storm
Sense of duty	To employer, to patients
Uncertainty/powerlessness/frustration	safety of their families, their own safety, lack of communication, rumors in the city, and rescue/evacuation from the hospital
Group identity and cohesiveness	CRNAs, other nurses and doctors
Anger	Too many patients and family members in hospital, government inability to rescue patients, staff, citizens
Life-changing event	Pre-Katrina, post-Katrina, appreciate little things in life

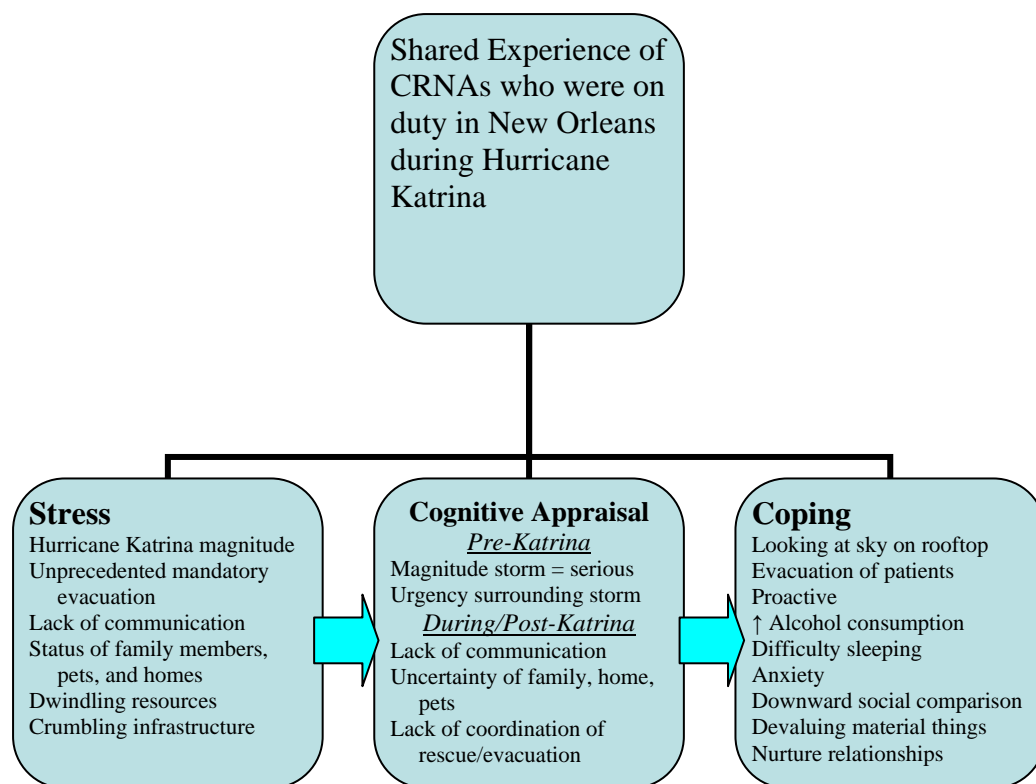


Figure 1. Theoretical Framework adapted from the Lazarus and Folkman Stress Appraisal and Coping Model⁶

CHAPTER 3

The Shared Experience of SRNAs whose Senior Year was Disrupted by Hurricane Katrina

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Abstract

The purpose of this focused ethnography was to describe the shared experiences of Student Registered Nurse Anesthetists (SRNAs) whose senior year was disrupted by Hurricane Katrina as well as to determine the psychosocial impact the storm had on them. A convenience sample of ten former SRNAs participated in focus groups that were audio-recorded, transcribed, and qualitatively analyzed. Three major themes emerged from the study: seriousness of urgency, managing uncertainty, and stability=relief. The themes represented how the SRNAs appraised and coped with the stressful events surrounding Hurricane Katrina. The psychosocial impact of Hurricane Katrina on the SRNAs resulted mainly in temporary increased alcohol consumption and anxiety. One person started smoking. The results of this study should be used to guide policies regarding educating SRNAs and nurse practitioner students during and immediately after a disaster and to provide a framework for future disaster studies regarding SRNAs.

Key Words:

Hurricane Katrina; SRNAs, Education, Focused ethnography

Background

Hurricane Katrina, one of the most devastating natural disasters in the history of the United States, ravaged New Orleans on August 29, 2005. The storm closed college campuses in New Orleans for the rest of the fall semester and displaced over 50,000 college students (Ladd, Marszalek, & Gill, 2006). The building that housed a New Orleans based Nurse Anesthesia Program (NAP) received one to two feet of water (Smith, 2005) and because of the damage caused by Hurricane Katrina, it became apparent that the education of the Student Registered Nurse Anesthetists (SRNAs) would be disrupted.

SRNAs are registered nurses who are enrolled as students in an accredited nurse anesthesia program and have at least one year of intensive care unit experience. Nurse anesthesia programs are housed in nursing schools, schools of allied health, medical schools, and other graduate schools. All programs offer at least a Master's degree in nursing or in nurse anesthesia. The New Orleans based Nurse Anesthesia Program, housed in the nursing school, lasts thirty two months and awards a Master of Nursing (MN) degree with a specialization in Nurse Anesthesia option upon satisfactory completion. Senior-level (senior) SRNAs had less than nine months left in their training when the storm disrupted their education.

Classes resumed within one month of the storm in Baton Rouge, which is 74 miles north and west from New Orleans. When classes resumed, all students were required to attend classes for five consecutive days in order to “make-up” missed classroom time because of Hurricane Katrina. After this initial week, classes were held

on a weekly basis, and distance learning technologies were employed to decrease the driving requirements of the students who were attending clinical rotations outside of the Baton Rouge area. The use of distance learning technology allowed the students to synchronously attend class utilizing their computers. This format allowed faculty members and students to sign into a specified cyber classroom. The faculty member was able to view a list of all participants who signed into the classroom. The students were able listen to the faculty member lecture while viewing the lecture material (i.e. Power Point) being presented and were able to participate in classroom discussion by typing comments which were seen by the faculty member.

Disasters on college campuses are not unique. In the last five years, campus shootings and natural disasters have impacted college campuses across this nation. Disaster literature on college students exists; however, no study has been conducted regarding SRNAs or any other Advanced Nurse Practitioner (ANP) students and natural disasters.

Method

This study was a focused ethnography utilizing group interviews to determine: a) the shared experience of SRNAs whose senior year was disrupted by Hurricane Katrina, and b) the psychosocial impact Hurricane Katrina had on these SRNAs. The protocol was approved by the applicable Institutional Review Boards and appropriate consents were obtained from all participants.

Focused ethnography describes a specific aspect of a culture and is generally conducted by someone familiar with the culture, and, therefore, fieldwork may not be

warranted (Knoblauch, 2005; Lecompte & Schensul, 1999). Focused ethnography differs from traditional ethnography in that traditional ethnography includes extensive fieldwork (immersion of the investigator into the culture being investigated) that lasts from months to years. The investigator was familiar with all of the SRNAs whose senior year was disrupted by Hurricane Katrina, and field work was not feasible for this study because the event (Hurricane Katrina) has passed. Culture can be described as a “persistent group pattern of behaviors, beliefs, norms, and attitudes” (Lecompte & Schensul, 1999, p. 21). The culture in this study was a group of senior-level SRNAs who were affected by a natural disaster. In an appropriately conducted focused ethnography, the relatively small sample size is offset by the in-depth information provided regarding the phenomenon under study (Creswell & Plano Clark, 2007).

Sample

A convenience sample of ten participants representing former SRNAs whose senior year was disrupted by Hurricane Katrina participated in one of three focus groups. There were 35 senior level students who were continuously enrolled in the Nurse Anesthesia Program for at least twenty-two months on August 29, 2005. The investigator personally knew all of them and was able to contact twenty of them via e-mail to invite them to participate in the study. The contact information for the other 15 former students was not available to the investigator. Prior to the focus group interview, the participants were asked to fill out a demographic survey, and the results were analyzed using the Statistical Package for the Social Sciences (SPSS) computer software. The age range of the participants during Hurricane Katrina was from 29 years old to 48 years old with the

majority being in the 30-40 year old age range. Five of the participants were female; seven were Caucasian, one African American, one Asian, and one Native American. Four reported being married, with three reporting being single, and two reporting being divorced. One did not report a marital status at the time of Hurricane Katrina. Most of the participants experienced greater than 10 hurricanes, and all but one reported that they evacuated for Hurricane Katrina. No one lost family members, although, three participants lost pets because of Hurricane Katrina. The reported property damage from Hurricane Katrina ranged from minimal to total loss of home and belongings.

Materials and Procedure

Focus group interviews took place in a quiet conference room with a co-facilitator who was an experienced focus group researcher and who recorded notes and the non-verbal cues of the participants. The co-facilitator was introduced to the participants, and her role was explained to them. The investigator utilized an interview guide consisting of a predetermined set of semi-structured questions, follow-up questions, and probes based on the Lazarus and Folkman (1984) stress, appraisal, and coping model to facilitate the interviews. The interviews were audio-recorded, transcribed verbatim, and checked for accuracy by reading the transcripts while listening to the audio recordings. The investigator analyzed the resulting transcripts for codes, patterns, and emerging themes using QSR International's NVivo 8 software. NVivo 8 is a computer software package designed to facilitate qualitative data analysis by allowing the investigator to import and analyze transcripts, photos, videos, and other documents electronically. The package is inherently easy to navigate and utilizes toolbars and tasks similar to Microsoft Word.

Results

The purpose of this study was to describe the shared experiences of SRNAs whose senior year was disrupted by Hurricane Katrina, to examine the psychosocial impact that Hurricane Katrina had on them, and to analyze emerging themes based on their focus group interviews. Three major themes emerged from over seventy pages of transcripts, co-facilitator notes, and investigator notes. The major themes included “seriousness of urgency”, “managing uncertainty”, and “stability equaled relief.”

Seriousness of Urgency

The participants expressed a sense of urgency regarding the evacuation from and the impact that Hurricane Katrina had on New Orleans. All participants but one evacuated for the storm, although several of them did not plan to evacuate initially. Some participants were urged by their family members to leave New Orleans. One participant stated that “*My dad never did leave either, but even he was in Houston saying, ‘You better get out of there’.*” Another participant recalled that “*You know, I wasn't going to leave because we never leave, and my mom left, which was like oh, she never leaves either.*” When the mayor of New Orleans called for a mandatory evacuation some participants realized the seriousness surrounding the storm. One participant shared:

Kind of hit home when he made that announcement. Because before that we were like oh, it's another hurricane, we'll be alright. Then, you know, on TV here he is, oh, this is definitely serious... he started doing all these scenarios that could happen like this could be the worst storm in decades.

The seriousness of the storm did not end with the evacuation. Several participants remembered watching television coverage of the city in the aftermath of Hurricane

Katrina and expressed disbelief at what was happening. One participant stated that *“I had the computer and I was streaming information and we started seeing all the things that were happening [in the city] as the day went on...we were all just kind of like we can't believe we can't go home.”* Another recalled that *“When I started seeing the television with the water everywhere and all these people like at the airport and everything, I was like oh my God, you know.”*

Managing Uncertainty

The participants shared expressions of uncertainty regarding resumption of classes, graduating on time, returning to clinical rotations, status of family and pets, and damage to their property. They expressed great anxiety regarding the status of the Nurse Anesthesia Program and whether classes would resume or if they would be able to complete their program of study and graduate. The participants of one focus group agreed with their colleague who stated:

It was a little bit chaotic, I guess, because without hearing anything from the program, there was a lot of uncertainty ... if we were going to graduate on time, if we were going to graduate at all because, we had no idea what was really going in New Orleans, if the nursing school was still there.

One participant in a different focus group stated:

I think that would have been like the straw that broke the camel's back because we were all just busting our butts to try and get done and to be told, Oh, you're not going to graduate on time, that would have been devastating for a lot of people.

The rest of the participants in this particular focus group nodded their heads in agreement with this statement.

Several participants sought employment as registered nurses (RNs) to support themselves while waiting to hear about resumption of classes. One person noted that “*I figured the best thing to do was for me to get a job and start making some money and then just trying to get back in touch with everybody and figuring out where everybody was.*”

Uncertainty existed regarding clinical assignments. Students were assigned to rotate in clinical sites in New Orleans as well as other sites around the state of Louisiana and a few sites in Mississippi, Tennessee, and Texas. Communication was poor after the storm, and several of the clinical sites were damaged. The participants stated they were unsure where to report for clinical assignments after Hurricane Katrina and before classes resumed. This uncertainty was exacerbated by the inability of the faculty members to communicate with the students initially after the storm. A few participants noted that they were contacted by the program director and told to go to their assigned clinical sites if at all possible. Eventually all students were contacted by the program director and advised to view the school’s emergency website and their school e-mail accounts for information pertaining to the Nurse Anesthesia Program and for communication with the faculty members. A few participants recalled reporting to a clinical site only to be told they were not needed because the site was utilizing displaced certified registered nurse anesthetists (CRNAs). One participant reported that the site refused to let them complete their clinical assignment:

I showed up at [the hospital] I think the Friday morning after the hurricane and the CRNAs over there told me that with the... not knowing anything about what the status of the nursing school was, that with regard to liability and stuff ... I wasn't protected, so they pretty much said, 'You can't function here as an SRNA

because without us knowing what status the school is in, you've got no protection whatsoever,' and it was like a liability thing for them to let me work [train] there.

Travel and housing were also areas of concern and uncertainty. Some participants reported being thankful that housing was provided by some of the clinical sites while others reported that they had a difficult time finding housing near their clinical sites. One person said a CRNA preceptor rented her a pool house 30 minutes from the clinical site, and another stated that she stayed with a classmate's family who lived near her clinical site. The participants mentioned that they had difficulty finding gas for their vehicles and had to carry full gas cans with them when they travelled to clinical sites and to school since many gas stations were damaged and closed after the storm.

The participants shared further uncertainty regarding the status of their family members, pets, and homes. Communication was sporadic as several participants noted that *"there was no communication with the outside world besides texting."* One participant recalled that *"You know, we lost our houses. And you can't get in touch with your family members because everybody's trying to call on the phone."* Another participant revealed that *"Just [the] anxiety of the unknown, how are your loved ones, how are your animals, what am I going to do about money? What am I gonna do about housing? It was ongoing and, you know?"* One person left her cats at home prior to evacuating because she thought she would be able to return within a few days to take care of them. She reported *"I got stressed about that. Oh God, you get visions in your head of your cats drowning and starving to death."* The participants shared their concerns about the rumors surrounding lawlessness in the city and worried for their personal safety when they returned to their homes to assess storm damage. One participant stated that *"I*

bought my handgun and a shotgun in the next couple of weeks and so it was just... feeling like I was having to fend for myself in ... almost a primal way, you know, worried about my personal safety.” A few participants “snuck” back into the city to check on their homes and pets prior to the Mayor officially allowing citizens to return to New Orleans. Those who illegally reentered the city recalled being frightened because of the lawlessness, yet the city was relatively *“peaceful and quiet and there were no birds chirping.”* They also noted that there were trees and power lines down around the city and that the grass was gray, brown, and crunchy.

Stability equaled Relief

All of the students expressed relief regarding the resumption of classes after Hurricane Katrina and the ability to graduate on time. Within a month after the storm devastated New Orleans, classes resumed in Baton Rouge. During the regular semester, classes were held one day per week. After Hurricane Katrina, classes were held everyday for the first five days and weekly thereafter. Face-to-face class attendance was mandatory during the first full week but afterwards, the students were given the choice to attend class via distance technology or to attend in person. Most of the participants chose to attend class in person even though distance technology was available to them. A few participants who did use the distance technology expressed being grateful for the convenience of not having to search for gas and drive to campus to attend class. One participant pointed out that storm debris cluttered the highways which made driving hazardous.

Some participants lost books, computers, professional attire and anesthesia equipment due to Hurricane Katrina. These participants stated they were able to purchase or borrow new computers, books, and anesthesia equipment. They shared that manufacturers gave them scrubs and one person even received a free pair of shoes to replace the ones she lost in the storm. Other participants related that they did not lose their books, computers, scrubs and anesthesia equipment but they were unable to retrieve these items for several weeks following the storm because they were not allowed to return to their homes.

When asked about their thoughts with respect to the resumption of classes, relief and the return to stability were common responses from participants. One participant stated that *“the fact that school started back up and we were allowed to get back into clinical, it gave me some sense that you were gonna be okay, that the school was intact, you were going to graduate eventually.”* Another participant noted *“Oh, immediate relief. We were all just rejoicing, so happy. Immediate relief. We were fine, let's get on with it. It was something to hold onto.”* A participant recalled:

I was very glad we were going to resume because I think from my standpoint, it was more of a financial burden and was hoping that geez, I hope I don't have to sit out another year to just keep borrowing more and more money. So that was a major concern of mine, so I was much relieved to hear that we were resuming classes and the way things planned out.

Another person's response to the resumption of classes was *“But when we found that it was coming back, it's just... oh, we were just relieved with thank goodness. So great relief. Ready to get back to something stable, yeah.”*

The participants were asked about the first class after Hurricane Katrina when everyone was together in one room. Several quotes summarize the shared experiences expressed by the participants. One quote was:

Oh, it was wonderful to see everybody. It was great to be able to just to hug everybody and make sure everybody was okay. And then of course, you know, then you could actually hear everybody else's stories and it was definitely... not only was an educational thing, but also just more of a social structure...

Another quote that summarized the shared experience of the first day of class after Hurricane Katrina was:

You realize everybody around you is okay, we made it through, you know. Because some people's stories, just everybody [would] get really quiet and listen and then other people, of course, had funny things that happened and, you know, it's just like oh gosh, the same experience. So it was... that was very cathartic to be able to meet with everybody and visualize everybody and say, Oh my gosh, we're all, we made it, we're back... you just wanted to blink your eyes and for it to be over with to come back to New Orleans.

Another participant summarized the experience as:

I think that it was just a profound sense of relief because we were assured that the very first day that we were going to graduate on time, you know, so regardless of what sacrifices we were going to have to make because the program wasn't able to function in New Orleans anymore, the timeline [of graduation] was not going to be disturbed at all.

Every participant expressed relief when they were told by the program director and the other anesthesia faculty members that they would graduate on time, in May 2006.

One participant stated: *"I felt really reassured by you guys saying, 'You are going to graduate.' And I think with [the program director]... I felt assured if anybody could get it done, she was going to make sure that we got out of there."* Other participants expressed gratitude that they were able to graduate on time. Some of them stated that they were

concerned about finding jobs after graduation because many of the hospitals were still closed in New Orleans in May, 2006.

Psychosocial Impact of Hurricane Katrina

One aim of this study was to examine the psychosocial impact of Hurricane Katrina on the former SRNAs whose senior year was disrupted by Hurricane Katrina. All of the participants denied having any long-term psychosocial impact from Hurricane Katrina. Several participants mentioned short-term stress and anxiety related to experiencing Hurricane Katrina. Several revealed that the stress and anxiety were related to the uncertainty of being able to complete their education. Most described a short-term increase in alcohol consumption after the storm to decrease their stress. One person started smoking cigarettes as a result of the events surrounding Hurricane Katrina.

The participants discussed the impact Hurricane Katrina had on their family members and other people more so than the impact it had on them. One participant stated:

I think that for me it was hard for me to allow myself to feel any kind of stress or anxiety because I knew that there were other people who were in a much worse place than I was. I mean, you know, people losing their houses and stuff. The... you know, the fact that somebody had broke into my apartment and stole a few things, I mean it just kind of paled in comparison, you know, to the people who lost houses and lost family members and whatnot, and so I think that I... if there was anything going on with me, like it got kind of like suppressed or repressed.

Several participants noted that older family members were more affected by Hurricane Katrina than they were because the older people had to see “*everything they built up just come apart.*” The participants described themselves as cohesive and resilient. One participant mentioned that the first year students in the nurse anesthesia program had a more difficult time than the seniors regarding their educational process “*God, if you*

were, you know, a freshman, that would have been so much more difficult. You know, and our class is really close and to see everybody, you know, once a week was so important, and not to have that, you know.” One participant mentioned losing everything and how that made her feel: “...it was weird because I was so materialistic... after you got over... losing everything, it was like a cleansing.” Another participant agreed with her by responding with “uh-huh.”

Discussion

This focused ethnography described the shared experiences of students whose senior year was disrupted by Hurricane Katrina as well as elucidated the psychosocial impact the storm had on them. This study was based on the stress, appraisal, and coping theory of Lazarus & Folkman (1984) which describes stress as a relationship between a person and the environment, in other words, a transactional process that emphasizes the individual’s analysis of the event, the individual’s cognitive appraisal of the importance of the event, and the individual’s determination of the response to the event, including available resources to cultivate the response (Matthieu & Ivanoff, 2006). For this study, the cultural environment of being a SRNA produced a template for the participants to frame their shared, stressful experiences. Figure 1 depicts the theoretical framework of the study.

The unexpected and urgent need to evacuate for a powerful hurricane; the graphic images on television that showed what was taking place in the city in the aftermath of the storm; the concern for the condition of their family members, pets, homes, and school; and the concern for personal safety were all shared stressors related to the events

surrounding Hurricane Katrina. Most SRNAs appraised the hurricane as a potential serious threat and responded by urgently evacuating from the city. After the storm, they realized they were experiencing a crisis when they appraised a lack of communication with school officials and clinical preceptors thereby causing concern regarding the status of the school and the completion of their education. Lack of communication also led to shared uncertainty regarding the status of family members, pets, and homes. Coping measures that were shared among the SRNAs included anxiety, a temporary increase in alcohol consumption, seeking nursing jobs, and staying heavily focused on their education and pending graduation once classes resumed. One participant purchased guns out of extreme concern for his personal safety. Many engaged in downward social comparison (*I was fortunate, we weren't affected as much as other people*) and other forms of cognitive reframing (*“it was like a cleansing”*).

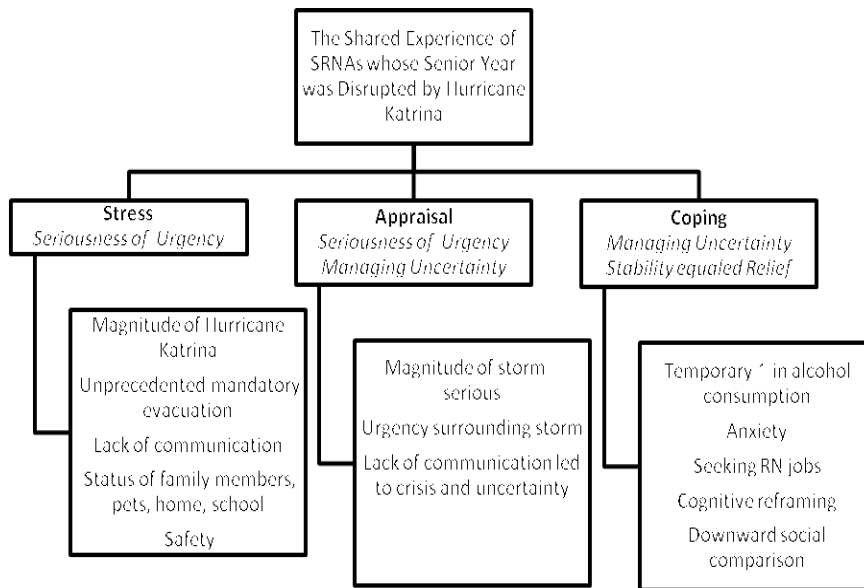


Figure 1. Theoretical Framework Model

Very little research exists in reference to disasters and college campuses/students although tragedies on campuses are not unique. McCarthy and Butler (2003) found that college students who were exposed to a tornado on campus experienced a progressive decline in anxiety, anger, and irritability over time. Their findings parallel the findings in this focused ethnography where the participants experienced short-term anxiety which dissipated over time. Blanchard et al. (2004) surveyed college students on campuses in New York, Georgia, and North Dakota regarding the World Trade Center terrorist tragedy of September 11, 2001. They found widespread high levels of acute stress related to the tragedy. These findings are similar to the findings in this focused ethnography in which the participants experienced high levels of stress and anxiety related to Hurricane Katrina and its aftermath. Cardenas et al. (2003) found that college students had an increased level of alcohol and substance abuse following the events of September 11, 2001. These findings are congruent with the findings of this focused ethnography in

which the participants responded to the events surrounding Hurricane Katrina with temporary increased alcohol consumption.

There are a number of limitations associated with this study. First, the study took place four years after the storm, and memories may have changed over time. Another limitation is that convenience sampling was used, and the results of the study may not be transferable except to other SRNAs whose senior year is disrupted by a hurricane or other similar natural disasters. Finally, the study may have been biased toward those who wished to tell their stories.

An implication of this study for SRNA and other Student Advanced Nurse Practitioner education includes developing plans, policies, and procedures for the relocation and resumption of nursing education after a disaster. This study highlights the necessity of developing policies for assuring ongoing communication between faculty and students in the immediate aftermath of a disaster. An implication for practice consists of developing policies regarding clinical assignments during disasters, educating the clinical preceptors of the policies, and communicating with the clinical sites that the educational program is open and students' liability insurance is in effect. An implication for future research involves the examination of the reactions and responses of SRNAs and CRNAs in the global wake of natural disasters, such as tornadoes, earthquakes, volcanic eruptions, and flooding, and their impact on all levels of SRNA's and CRNA's physical and emotional aftermath.

Based on the findings of this study and other studies regarding college students and disasters, students' psychosocial needs during, and in the immediate aftermath of the

event, should be supported. Effective communication between the program faculty and students is essential to support the students' psychosocial needs. Psychosocial support can be in the form of counseling referrals prior to the students returning to class and formalized crisis debriefing when the students return to class. Other forms of psychosocial support include individual assessments for anxiety, individual counseling, and group counseling.

The SRNAs shared a sense of urgency and gravity surrounding Hurricane Katrina, the evacuation process, and their sense of personal safety. They were uncertain if they would be able to complete their education and graduate on time. Once classes resumed, they shared relief that their education would continue and that they would indeed graduate on time. This was the first study to systematically examine and document SRNA's reactions to a natural disaster and the impact the disaster had on their stress appraisal and coping mechanisms. This study informed educators of the impact a natural disaster can have on graduate nursing students and the critical importance of having disaster policies in place. Disaster policies may include communication between the school faculty, students and clinical preceptors after a disaster; education of students after a disaster; and psychosocial support of students following a disaster.

References

- Blanchard, E. B., Kuhn, E., Rowell, D. L., Hickling, E. J., Wittrock, D., Rogers, R. L., et al. (2004). Studies of the vicarious traumatization of college students by the September 11th attacks: effects of proximity, exposure and connectedness. *Behaviour Research and Therapy*, 42, 191-205.
- Cardenas, J., Williams, K., Wilson, J. P., Fanouraki, G., & Singh, A. (2003). PTSD, Major Depressive Symptoms, and Substance Abuse Following September 11, 2001, in a Midwestern University Population. *International Journal of Emergency Mental Health*, 5(1), 15-28.
- Creswell, J. W., & Plano Clark, V. L. (2007). *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: Sage.
- Knoblauch, H. (2005, March 5). *Focused Ethnography*. Retrieved April 23, 2008, from Forum: Qualitative Social Research Web site: <http://www.qualitative-research.net/fqs-texte/3-05/05-3-44-e.htm>
- Ladd, A. E., Marszalek, J., & Gill, D. A. (2006). *The Other Diaspora: New Orleans Student Evacuation Impacts and Responses Surrounding Hurricane Katrina*. Paper presented at the meeting of the The Annual Meeting of the Southern Sociological Society. New Orleans, La.

- Lazarus, R. S., & Folkman, S. (1984). *Stress, Appraisal, and Coping*. New York: Springer.
- Lecompte, M. D., & Schensul, J. J. (1999). *Designing and Conducting Ethnographic Research*. Walnut Creek, Ca: Sage.
- Matthieu, M. M., & Ivanoff, A. (2006). Using Stress, Appraisal, and Coping Theories in Clinical Practice: Assessments of Coping Strategies After Disasters. *Brief Treatment and Crisis Intervention*, 6(4), 337- 348.
- McCarthy, M. A., & Butler, L. (2003). Responding to Traumatic Events on College Campuses: A Case Study and Assessment of Student Postdisaster Anxiety. *Journal of College Counseling*, 6, 90-96.
- NVivo qualitative data analysis software; QSR International Pty Ltd. Version 8, 2008.
- Smith, R. (30). *Hurricane Katrina Recovery- Update #1*. Retrieved December 5, 2007, from http://www.lsuhsu.edu/biweekly/update_20050930.aspx.

CHAPTER 4

Did Hurricane Katrina have an impact on Self Evaluation Exam scores of senior-level students in the Louisiana State University Health Sciences Center School of Nursing Nurse Anesthesia Program?

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Abstract

All Nurse Anesthesia Programs in the United States of America have the potential to be impacted by a disaster. The purpose of this observational study was to determine if Hurricane Katrina had an impact on the outcome of the Self-Evaluation Exam (SEE) taken by senior-level students in the Louisiana Health Sciences Center School of Nursing Nurse Anesthesia Program. The sample consisted of 62 students who took the SEE prior to Hurricane Katrina and 112 students who took the exam after Hurricane Katrina. Archived data was collected and included SEE scores and potential confounding variables which consisted of: age, gender, length of time in program at the time of the SEE, Bachelor of Science in Nursing (BSN) grade point average (GPA), and Graduate Record Exam (GRE) Score/ Miller Analogy Test (MAT) score. Within the final regression model, a t-test indicated there was no significant difference between pre-Katrina SEE scores and post- Katrina SEE scores ($p = .434$) when controlling for potential confounding variables. This is the first study conducted to examine the impact of a natural disaster on SEE scores. While no significant differences existed between SEE scores when taken before and after Hurricane Katrina, future inquiry should take place to validate the results of this study.

Key Words: Hurricane Katrina; SRNAs, Education, Self-Evaluation Exam

Introduction

Hurricane Katrina was one of the most devastating and costly natural disasters in the history of the United States.^{1(p930)} The storm heavily damaged the Louisiana State University Health Sciences Center (LSUHSC) which houses the School of Nursing, in which the Nurse Anesthesia Program (NAP) resides. LSUHSC is located in the Central Business District of New Orleans and is two blocks away from Interim Louisiana State University Public Hospital (ILH). The LSUHSC infrastructure was submerged in one to two feet of water in the hurricane's aftermath.² Immediately after the storm, uncertainty existed as to when LSUHSC would reopen. The NAP resumed classes three weeks after the storm in Baton Rouge on the campus of Southeastern Louisiana University School of Nursing.

The NAP at LSUHSC is a 32 month program and the students are awarded a Master of Nursing Degree with a specialization in Nurse Anesthesia upon satisfactory completion of all requirements. Students receive a wide variety of clinical experiences in urban, suburban, and rural clinical sites and provide care to culturally diverse and underserved populations. The first class graduated in 2004.

Students in the LSUHSC NAP are required to take a national standardized exam, the Self-Evaluation Exam (SEE), in their senior year. The SEE is administered by the National Board on Certification and Recertification of Nurse Anesthetists (NBCRNA). The SEE provides information on student progress and gives students test-taking experience. The SEE is to inform program directors how well they are preparing their students with anesthesia knowledge and skills needed for anesthesia practice which may

influence curriculum development and improvement.^{3,4} Test items on the SEE are based on the curriculum requirements of nurse anesthesia programs as set forth by the Council on Accreditation of Nurse Anesthesia Educational Programs (COA). The SEE is reported using scaled scores or percentiles for the overall test and for each subtest and there is no proscribed passing score for the test. Currently, the SEE consists of five subtests. Prior to 2007, the SEE consisted of six subtests. Table 1 displays the past and present composition of SEE subtests. There is no available data on the reliability, validity, predictive capability, or other psychometrics, yet the test is widely used. There were thirty-five senior-level students in the LSUHSC NAP when Hurricane Katrina struck New Orleans. Four of them took the SEE prior to the storm and thirty-one of them took the SEE after the storm.

Table 1. Composition of SEE past and present

Prior to 2007		2007 to present	
Subtest	Portion of SEE	Subtest	Portion of SEE
Professional/legal aspects	5%	Professional/legal aspects	13%
Anatomy/Physiology/Pathophysiology	30%	Anatomy/Physiology/Pathophysiology	29%
Pharmacology	20%	Pharmacology	25%
Basic Principles	15%	Basic Principles	14%
Advanced Principles	20%	Advanced Principles	19%
Physical Sciences	10%	N/A	N/A

There are over 100 NAPs in the United States and every one of them has the potential to be affected by a natural disaster whether it is a hurricane, a tornado, a wild

fire, an earthquake, volcanic activity, flooding, or heavy snowfall. The impact of a natural disaster on education may range from a minor nuisance to a major disruption as in the case of Hurricane Katrina's impact on the LSUHSC NAP. Very little research exists in reference to disasters and college campuses/students although tragedies on campuses are not unique.

An exhaustive search of the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the Education Resources Information Center (ERIC) database using the terms disaster, hurricane, stress, test outcome, test taking, and graduate student, were used separately and in combination, revealing no pertinent articles regarding disasters and test outcomes. Ample literature exists regarding test anxiety and test outcomes but these investigations are focused primarily on the phenomenon of test anxiety, rather than how stress may affect test outcomes. To date, no literature exists regarding the effect of natural disasters on test outcomes.

The purpose of this study was to determine if Hurricane Katrina had an impact on the outcome of the SEE taken by senior-level students enrolled in the LSUHSC NAP. The guiding research question was: Did Hurricane Katrina have an impact on SEE scores of senior-level student registered nurse anesthetists in the LSUHSC NAP who took the test after the storm?

Material and Methods

This study was a non-experimental observational design. The design was chosen because the investigation took place in the aftermath of Hurricane Katrina and the investigator had no control over the manipulation of variables or the sample groups. The

Institutional Review Boards at Virginia Commonwealth University and LSUHSC approved this study.

The outcome variable was the overall percentile score of the SEE attained by the individuals in the sample. The predictor variable was the date that the SEE was taken, in other words, prior to or after Hurricane Katrina which happened on August 29, 2005. To add strength to the design, potential confounding variables were included in the data analysis. Potential confounding variables included: age, gender, length of time in program at the time of the SEE, Bachelor of Science in Nursing (BSN) grade point average (GPA), and Graduate Record Exam (GRE) Score/ Miller Analogy Test (MAT) score and were chosen based on limited research regarding the National Certification Exam (NCE) for nurse anesthetists.^{5,6} Age at the time the SEE was taken was calculated based on date of birth. Length of time in program was determined as the number of months the student was enrolled in the NAP when the SEE was taken. The “length of time in program” variable was chosen to determine if there may have been a difference in SEE scores between students who took the test early in their academic curriculum and those who took the test later in their academic curriculum. GRE verbal percentiles, GRE quantitative percentiles, and GRE Analytical percentiles were recorded. MAT percentiles overall and MAT percentiles for intended major were also recorded. The LSUHSC NAP requires applicants to take either the GRE or the MAT. If students took both, the GRE score was used.

The sample was senior-level students enrolled in the LSUHSC NAP who graduated between the years of 2004 and 2008 and who took the SEE. The graduating

classes of 2004 and 2005 did not encounter Hurricane Katrina during their tenure as LSUHSC NAP students. There were thirty-five senior-level students in the LSUHSC NAP when Hurricane Katrina struck New Orleans. Four of these students took the SEE prior to the storm and thirty-one of them took the SEE after the storm. This group of students graduated in 2006. The graduating classes of 2007 and 2008 also experienced Hurricane Katrina while enrolled in the LSUHSC NAP. The sample consisted of 62 senior-level students who took the SEE prior to Hurricane Katrina and 112 senior-level students who took the SEE after Hurricane Katrina. There were a limited number of potential subjects to incorporate into this study because the LSUHSC NAP is a relatively new program. The LSUHSC NAP admitted the first class in 2002; twenty-four students graduated in 2004. Each subsequent NAP class slowly increased in size until it reached its current class size of 45-50 students. The LSUHSC NAP graduating classes of 2006-2008 were the only LSUHSC NAP classes to experience the effects of Hurricane Katrina while they were enrolled in the program. Based on a power analysis with the α set at .05, the β set at .80, and the effect size estimated at .50, the calculated sample size was 63 subjects per group. There were no previous studies in this field from which to derive the effect size therefore it was estimated at 0.5. Polit and Beck pointed out that “most nursing studies cannot expect effect size greater than .50.”^{7(p498)}

Permission to access archived student data was granted by the dean and the administrative council of the LSUHSC School of Nursing. The archived data included SEE scores, date SEE was taken, date of birth, gender, BSN grade point average, and GRE/MAT scores. The results of the SEE were reported as a raw score except in 2006,

when they were reported in percentiles. Raw SEE scores were converted into percentiles for consistency using SEE score conversion tables provided by the NBCRNA. To ensure anonymity, each student was assigned a unique identification number which was only known to the primary investigator. This data was recorded on Excel spreadsheets, categorized by graduating class year, and imported into SAS 9.1.3 for analysis.

Individuals were excluded if any of the data was incomplete.

Regression analysis was used to describe the relationship between the overall percentile score of the SEE and the year the test was taken (prior to or after Hurricane Katrina) while adjusting for potential confounding variables. The SEE outcome was categorized as either pre-Hurricane Katrina (before August 29, 2005) or post-Hurricane Katrina (after August 29, 2005). The final regression model included SEE scores by year taken as well as age, GRE verbal percentile score or MAT overall percentile score.

Results

The convenience sample consisted of 174 former students who graduated between 2004 and 2008. Eight students were excluded due to missing data such as GRE or MAT scores. Descriptive statistics regarding the sample and SEE scores by graduation year are shown in Table 2.

Table 2. Demographics and SEE scores by graduation year

Graduation Year	N Observations	Variable	Mean	Standard Deviation	Minimum	Maximum
2004 ^a	24	Age (years)	32.66	5.02	24.00	44.00
	14	Female				
	10	Male				
	24	LOT (Months)	31.04	0.20	31.00	32.00
	23	GRE or MAT%	52.00	21.16	13.00	92.00
	23	BSN GPA	3.20	0.42	2.49	3.75
	24	OVRL PCT SEE	53.13	25.60	3.42	87.79
2005 ^a	34	Age (years)	36.00	6.83	26.00	54.00
	24	Female				
	10	Male				
	34	LOT (months)	26.50	0.74	25.00	27.00
	33	GRE or MAT%	49.63	19.04	11.00	87.00
	33	BSN GPA	3.35	0.36	2.65	4.00
	34	OVRL PCT SEE	27.46	23.51	3.42	81.12
2006 ^a	4	Age (years)	29.25	1.50	28.00	31.00
	4	Female				
	0	Male				
	4	LOT (months)	24.00	0	24.00	24.00
	4	GRE or MAT%	32.50	13.32	13.00	43.00
	4	BSN GPA	3.40	0.29	3.14	3.74
	4	OVRL PCT SEE	25.55	11.04	16.39	38.60
2006 ^b	31	Age (years)	33.6	5.78	25.00	49.00
	15	Female				
	16	Male				
	31	LOT (months)	30.45	2.17	27.00	39.00
	29	GRE or MAT%	54.75	16.46	26.00	92.00
	31	BSN GPA	3.33	0.34	2.70	4.00
	31	OVRL PCT SEE	43.14	30.77	2.29	99.18
2007 ^b	38	Age (years)	33.78	6.45	26.00	49.00
	24	Female				
	18	Male				
	38	LOT (months)	26.60	1.05	25.00	32.00
	35	GRE or MAT%	49.82	14.86	18.00	82.00
	37	BSN GPA	3.30	0.38	2.60	4.00
	38	OVRL PCT SEE	34.26	25.77	3.00	99.00
2008 ^b	43	Age (years)	31.74	5.00	26.00	46.00
	29	Female				
	14	Male				
	43	LOT (months)	24.97	0.83	24.00	27.00
	42	GRE or MAT%	52.69	20.77	16.00	92.00
	43	BSN GPA	3.26	0.29	2.64	3.90
	43	OVRL PCT SEE	41.12	27.82	1.57	96.41

^a indicates SEE taken prior to Hurricane Katrina; ^b indicates SEE taken after Hurricane Katrina; LOT denotes length of time the student was enrolled in the Nurse Anesthesia Program when the SEE was taken; OVRL PCT SEE indicates the overall percentile score of the SEE. Note: all N observations in each year are not equal due to missing data.

2004 graduates had the highest overall SEE percentile score which was significantly higher than 2005 and 2007 graduates ($p = .001$ and $.016$). 2004 graduates also had the lowest BSN GPA and took their SEE latest in their academic curriculum. The 2005 graduates were the oldest group in the study. 2006 graduates who took the SEE prior to Hurricane Katrina were the youngest in the group, had the highest BSN GPA, had the lowest GRE/MAT scores, had the lowest overall SEE percentile score and took the SEE earliest in their academic curriculum. 2006 graduates who took the SEE after Hurricane Katrina had the highest GRE/MAT scores. There were no significant findings that differentiated the graduating classes other than what was previously mentioned.

The potential confounding variables were screened in the initial general linear model (regression) and age, GRE verbal percentile and overall MAT percentile seemed to show an overall affect on the outcome. Age was negatively related to the overall percentile score of the SEE ($p = .014$) that is, the older the student was at the time of the test, the lower the score obtained. The GRE Verbal score and the MAT overall score were positively related to the overall percentile score of the SEE ($p = .004$). Within the final regression model, a t-test indicated there was no significant difference between pre-Katrina SEE scores and post- Katrina SEE scores ($p = .434$) when controlling for potential confounding variables. Figure 1 depicts the histograms of SEE score percentiles by year taken as well as by category of pre- and post-Hurricane Katrina. No significant difference was found in the SEE scores of students who took the test prior to Hurricane Katrina and students who took the test after the storm. The overall SEE scores were

higher after Hurricane Katrina than prior to the storm with the exception of the 2004 graduating class.

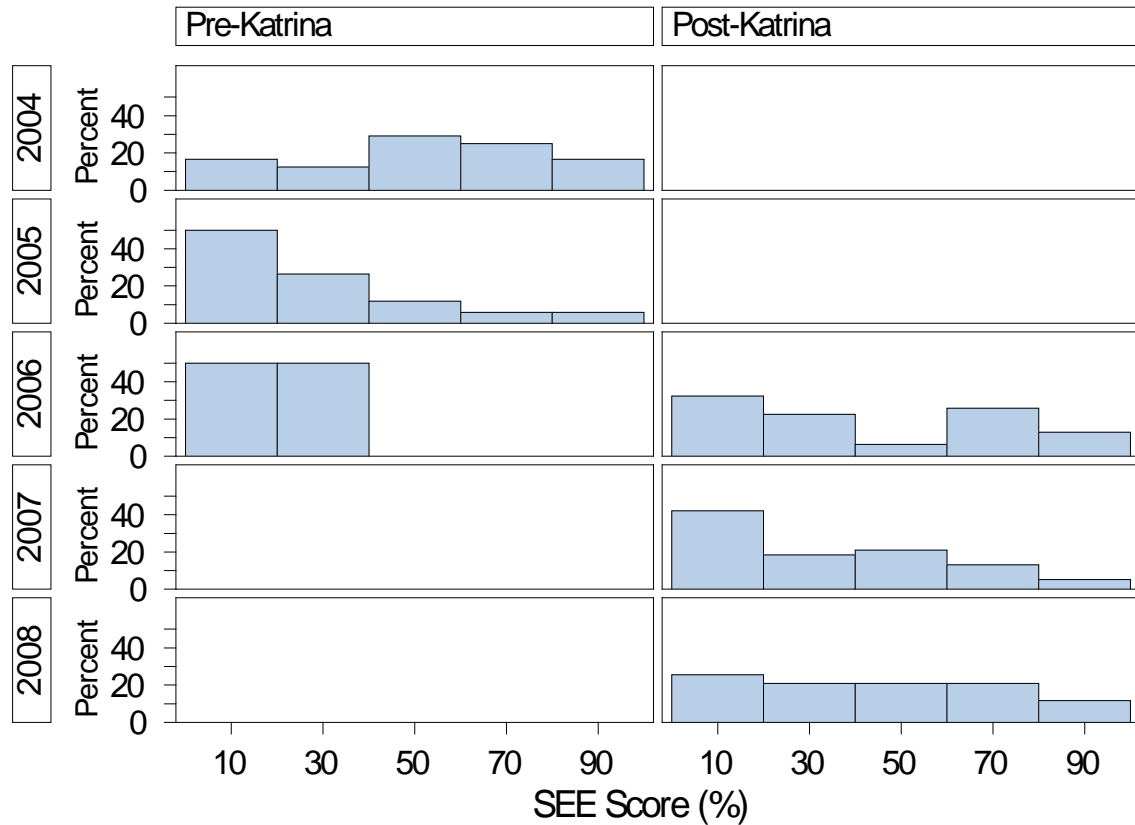


Figure 1. SEE Score Percentiles by Year Taken

Note: In 2006 there were students who took the SEE pre-Hurricane Katrina (n = 4) and post-Hurricane Katrina (n = 31). The vertical axis represents the percent of students who received the corresponding scores.

Discussion

The purpose of this study was to determine if Hurricane Katrina had an impact on the outcome of the SEE taken by senior-level students enrolled in the LSUHSC NAP.

The findings suggest that Hurricane Katrina did not have an impact on the outcome of the SEE taken by these individuals. This finding may validate the suggestion that “most college students are quite resilient in the face of post-disaster.”⁸ One finding in this study

included the negative correlation between age and the SEE score. Zaglaniczny⁵ found that age was a significant predictor of the outcome of the NCE for nurse anesthetists (younger test takers scored higher). Although the NCE and SEE are not the same test, the outcomes may be strongly correlated based on previous research demonstrating that the results of the SEE taken by senior-level students significantly predicted the passing of the NCE.⁶

The current study was based on the stress, appraisal, and coping theory of Lazarus and Folkman, which views stress as a transactional process that emphasizes individual analysis of the event, cognitive appraisal of the event, and the response to the event. Their model includes identifying and accessing available resources to cultivate the response.^{9,10} Students who were exposed to the stress of Hurricane Katrina may have had adequate coping measures as evidenced by the lack of significant change from SEE scores in non-exposed students. In a separate study, focus groups were conducted with a sample of students from the LSUHSC NAP graduating class of 2006. The focus groups examined their shared experiences of NAP disruption due to Hurricane Katrina interruption of their senior year (M.A.G., unpublished data, August 2010). The results of that study indicated that the students utilized several coping mechanisms to combat the stress of Hurricane Katrina and that there was no long-term psychosocial impact from Hurricane Katrina.

A limitation of this study was that the results may only be generalizable to nurse anesthesia programs that require their senior-level students to take the SEE and also to programs that may be prone to hurricanes or other natural disasters. Some NAPs require their students to take the SEE as first year students, others require second year (senior-

level) students to take the SEE, and a number require students to take the SEE both years. There are several NAPs that are in hurricane-prone areas; however, they are the minority of NAPs. Another limitation to this study is that there was a lack of research on this topic to corroborate the findings. Because of this limitation, the conclusions of this study may be tentative and not generalizable.

The sample size posed a limitation to this study. According to the power analysis, the sample size was calculated at 63 subjects in each group. This study had 62 subjects in the pre-Katrina SEE score group and 112 subjects in the post-Katrina SEE score group. There were no other subjects that could have been enrolled in the pre-Katrina SEE score group. Ideally, a larger number of students who were impacted by the storm in their senior year would have strengthened the study. Yet another limitation included the inability to access the reliability and validity of the SEE. Despite its widespread use by NAPs, there is a limited body of evidence and research regarding the SEE.

Results from this study indicate that Hurricane Katrina had no impact on the SEE scores of senior-level students enrolled in the LSUHSC NAP during the hurricane and its aftermath. However, there are several implications for education, administration, and research. One educational implication is that performance on a standardized test taken by nurse anesthesia students may not be impacted in the wake of a natural disaster. This finding may be important to student registered nurse anesthetists (SRNAs) regarding the insignificant impact a natural disaster appears to have on the outcome of the SEE and possibly other standardized exams. Another educational implication of this study demonstrates the need to collect psychometrics on the SEE and to assess the validity and

reliability of the test. A third educational implication presents the necessity to collect data to compare the reliability and validity of the SEE when it consisted of six subtests to its present five subtest format.

All NAPs have the potential to be affected by a natural disaster and the findings of this study should stimulate NAP administrators to examine current administrative and educational policies regarding disaster preparedness. An administration implication includes the need for administration policies regarding the decision to require students to take exams in the wake of a disaster. NAP administrators should not expect students who are affected by a natural disaster to perform poorly on the SEE. Although students who are impacted by disaster may not score lower on the SEE, they should still have psychosocial resources available to them after the disaster.

Future research should be conducted in other areas of the country that experience natural disasters to further validate the findings of this study. An area of future inquiry should include whether disasters have an impact on NCE scores. A third recommendation for future research involves whether SEE scores predict NCE outcomes. A final recommendation would be to derive the psychometrics of the SEE. This is crucial because the SEE is used nationwide and psychometric properties are integral to the integrity of the SEE. Data from the SEE has been collected for almost 20 years; thus there should be ample information available to calculate subscale and standard measures.

This is the first study conducted to examine the impact of a natural disaster on SEE scores. While no significant differences existed between SEE scores when taken

before and after Hurricane Katrina, implications of the results can inform program administrators, educators, researchers, and students.

References

1. Kessler RC, Galea S, Jones RT, Parker HA. Mental illness and suicidality after Hurricane Katrina. *Bull World Health Organ.* 2008;84(12), 930-938.
2. Smith R. Hurricane Katrina Recovery-Update #1. Louisiana State University Health Sciences Center Web site:
http://www.lsuhscc.edu/biweekly/update_20050930.aspx. Updated September 30, 2005. Accessed December 5, 2007.
3. (Fagerlund K McShane F 2005 Self-Evaluation Examination: Past, Present, and Future)Fagerlund K, McShane F. The Self-evaluation examination: past, present, and future. *AANA J.* 2005;73(1), 21-23.
4. (Lavelle T Zaglaniczny K Spitzer L E 2000 Computerized adaptive administration of the self-evaluation examination)Lavelle T, Zaglaniczny K, Spitzer LE. Computerized adaptive administration of the self-evaluation examination. *AANA J.* 2000;68(3), 226-231.
5. (Zaglaniczny K L 1991 An analysis of the factors which predict performance on the national certification examination for nurse anesthetists)Zaglaniczny KL. *An analysis of the factors which predict performance on the national certification examination for nurse anesthetists* [dissertation]. Detroit: Wayne State University; 1991.
6. Lebeck LL. Correlation of student factors with performance on the national certification examination for nurse anesthetists [dissertation]. Chicago: Rush University; 2003.

7. Polit DF, Beck CT. Nursing Research Principles and Methods. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2004.
8. Disasters and college and university students. Georgia Department of Behavioral Health and Developmental Disabilities Web Site.
<http://www.georgiadisaster.info/Schools/colleges.html>. Accessed September 14, 2010.
9. Lazarus RS, Folkman S. *Stress, appraisal, and coping*. New York: Springer Publishing Company;1984.
10. Mathieu MM, Ivanoff A. Using stress, appraisal, and coping theories in clinical practice: assessments of coping strategies after disasters. *Brief Treatment Crisis Intervent*. 2006;6(4): 337-348.

CHAPTER 5: CONCLUSION

Hurricane Katrina was one of the most devastating and costly natural disasters in the history of the United States (Kessler, Galea, Jones, & Parker, 2006, p. 930). The overarching goal of this study was to explore the impact that Hurricane Katrina had on the nurse anesthesia community in New Orleans. The aims of this study were (a) to explore the shared experiences of Certified Registered Nurse Anesthetists (CRNAs) who were on duty in New Orleans during Hurricane Katrina, (b) to ascertain the psychosocial impact that Hurricane Katrina had on CRNAs who were on duty in New Orleans during Hurricane Katrina, (c) to explore the shared experiences of SRNAs whose senior year was disrupted by Hurricane Katrina, (d) to ascertain the psychosocial impact that Hurricane Katrina had on SRNAs whose senior year was disrupted by Hurricane Katrina, and (d) to determine if Hurricane Katrina had an impact on Self-Evaluation Exam (SEE) scores of Louisiana State University Health Sciences Center (LSUHSC) Nurse Anesthesia Program (NAP) Student Registered Nurse Anesthetists (SRNAs). The aims of this study were achieved through three studies which are presented in this three paper option.

The results of the qualitative study examining shared experiences of CRNAs revealed six major themes that described the shared experiences of CRNAs who were on duty in New Orleans during Hurricane Katrina. The themes are depicted in Table 1.

Table 1

Major themes and descriptors of qualitative paper on shared experiences of CRNAs

Theme	Descriptors
Caught off guard	Course of storm, preparation for storm, magnitude of storm
Sense of duty	To employer, to patients
Uncertainty/powerlessness/frustration	safety of their families, their own safety, lack of communication, rumors in the city, and rescue/evacuation from the hospital
Group identity and cohesiveness	CRNAs, other nurses and doctors
Anger	Too many patients and family members in hospital, government inability to rescue patients, staff, citizens
Life-changing event	Pre-Katrina, post-Katrina, appreciate little things in life

Most participants communicated that they experienced short-term psychosocial effects related to Hurricane Katrina such as difficulty sleeping and increased alcohol consumption. Two participants stated they experienced longer-lasting psychosocial effects related to Hurricane Katrina which manifested as an anxiety disorder and the inability to sleep in the dark.

CRNAs were caught off guard by Hurricane Katrina yet they still shared a sense of duty when they were activated for the storm. They faced uncertainty and powerlessness, and expressed anger at situations revolving around the storm and the institutions. However, they also experienced group identity and cohesiveness throughout their tenure on storm duty. Hurricane Katrina was a life-changing event for those who experienced it as these participants did.

The results of the second paper, which examined SRNAs, revealed three major themes that described the shared experiences of SRNAs whose senior year was disrupted by Hurricane Katrina. The major themes included “seriousness of urgency”, “managing uncertainty”, and “stability equaled relief.” All participants denied having persistent psychosocial effects related to Hurricane Katrina and most participants revealed they experienced some form of short-term psychosocial effects related to Hurricane Katrina. The short-term psychosocial effects included stress and anxiety related to completing their education on time; short-term increased alcohol consumption; and one person started smoking cigarettes after the storm.

The results of the third paper, an examination of pre- and post-Katrina SEE scores, indicated that Hurricane Katrina did not have a significant impact on SEE scores of LSUHSC NAP students. The students who experienced Hurricane Katrina may have had adequate coping measures in place as evidenced by performance on the SEE. There was no significant difference between SEE scores taken by students pre-Katrina and SEE scores taken by students post-Katrina.

The study was based on the stress, appraisal, and coping theory of Lazarus and Folkman (1984), which views stress as a transactional process that emphasizes individual analysis of the event, cognitive appraisal of the event, and the response to the event. Their model includes identifying and accessing available resources to cultivate the response (Lazarus and Folkman, 1984; Matthieu & Ivanoff, 2006). Across the three papers, Hurricane Katrina was the major stressor. Several common areas of stress were revealed within the qualitative studies. They included the magnitude of Hurricane Katrina, which

was a strong category 3; the unprecedented mandatory evacuation of New Orleans; the lack of communication with family members, friends, colleagues, and program faculty; the unknown status of family members, pets, and homes; and personal and family safety. The CRNAs additionally noted dwindling resources and crumbling infrastructure as stressors.

Participants in the qualitative studies revealed the appraisal of uncertainty and urgency surrounding Hurricane Katrina as a serious threat to them. They also related that the lack of communication led to a crisis situation. The participants in the CRNA qualitative study disclosed that the lack of coordinated rescue efforts of patients, health care workers and citizens also led to a crisis situation.

Several coping measures were shared by participants in both the CRNA and the SRNA studies. These measures included anxiety, a temporary increased alcohol consumption, and downward social comparison. An example of downward social comparison was when a participant expressed that his losses were not so terrible when compared with some of his colleagues. . The CRNAs in the first study coped by leaving the enclosed buildings and climbing to the rooftops to view the city and sky as well as breathe fresh air. They were proactive in rescuing patients and themselves. These participants coped by placing more emphasis on personal relationships and placing less emphasis on the value of material things. The participants in the SRNA study coped by seeking jobs as registered nurses in case they were unable to resume their education. Once they were able to resume their education, they stayed focused on completing their education. They also participated in cognitive reframing as a coping measure. An

example of cognitive reframing was when a participant noted that the events surrounding Hurricane Katrina were like a “cleansing.” The third paper examined SEE score pre- and post-Katrina, and revealed that students who were exposed to the stress of Hurricane Katrina may have had adequate coping measures. There were no significant differences in the outcomes of the SEE between students who took the test prior to Hurricane Katrina and those who took the test after the storm.

Based on the results of this dissertation study, I would recommend implementation of policies in the hospitals that would encourage activation team CRNAs to bring enough provisions for five days to the hospital. Provisions should include food, water, toiletries, extra clothing, bedding, battery powered radios, flashlights, and extra batteries. The CRNAs should also be educated as to their expected roles within the hospital during a disaster and how long they are expected to remain on duty. Disaster counseling should be available to the CRNAs after they experience disaster duty.

Recommendations regarding the education of SRNAs as well as other advanced nurse practitioner students include developing plans, policies, and procedures for the relocation and resumption of nursing education after a disaster; developing policies for assuring ongoing communication between faculty and students in the immediate aftermath of a disaster; and developing policies regarding clinical assignments during disasters, educating the clinical preceptors of the policies, and communicating with the clinical sites that the educational program is open and students’ liability insurance is in effect. Based on the findings of this study and other studies regarding college students and disasters, students’ psychosocial needs during, and in the immediate aftermath of the

event, should be supported. Effective communication between the program faculty and students is essential to support the students' psychosocial needs. Psychosocial support can be in the form of counseling referrals prior to the students returning to class and formalized crisis debriefing when the students return to class. Other forms of psychosocial support include individual assessments for anxiety, individual counseling, and group counseling.

Disasters encompass more than hurricanes, earthquakes, tornadoes and wildfires. Recently, volcanic eruptions in Iceland disrupted air travel in Europe and thereby impacted the ability to ship and receive goods. Devils Lake in North Dakota has been expanding for 20 years and has permanently flooded homes and other buildings. The lake is expected to expand and flood the town's only school within the next few years. No area of the world is immune to disaster; therefore, all healthcare facilities and all educational facilities should have policies in place to address the potential impact that disasters may have on them. CRNAs are usually considered essential personnel and will be required to report for duty during a disaster. SRNAs are not considered essential personnel but may be attending clinical in areas that are affected by disasters. Continuing the education of SRNAs as early as possible in the wake of disasters is pertinent. Policies regarding health care worker disaster duty and nursing education should be developed or revised based on disaster studies.

The results of this investigation may be useful for future disaster planning and future investigative inquiry into the impact of disasters on individuals. Suggested areas of future investigation include: evaluation of the reactions and responses of SRNAs and

CRNAs in the global wake of natural disasters, such as tornadoes, earthquakes, volcanic eruptions, and flooding; the impact of disasters on all levels of SRNA's and CRNA's physical and emotional responses and recovery; exploration of the impact of natural disasters on the NCE; examination of whether SEE scores predict the outcome of the NCE; and further exploration of the impact a natural disaster has on SEE scores.

List of References

List of References

- American Association of Nurse Anesthetists. (2008). *Self Evaluation Examination*.
Retrieved January 25, 2008, from American Association of Nurse Anesthetists
Web site:
http://www.aana.com/Credentialing.aspx?ucNavMenu_TSMMenuTargetID=115&ucNavMenu_TSMMenuTargetType=4&ucNavMenu_TSMMenuID=6&id=571
- Berggren, R. E., & Curiel, T. J. (2006). After the storm- health care infrastructure in post-Katrina New Orleans. *New England Journal of Medicine*, 354, 1549-1552.
- Chang, C. M., Lee, L. C., Connor, K. M., Davidson, J. R., Jefries, K., & Lai, T. J. (2003). Posttraumatic distress and coping strategies among rescue workers after an earthquake. *Journal of Nervous and Mental Disease*, 191, 391-397.
- Environmental Defense. (n.d.). Retrieved June 4, 2007, from
<http://www.environmentaldefense.org/article.cfm?contentid=5365&campaign=48>
- [6](#)
- International Hurricane Research Center. (2006). Retrieved November 20, 2007, from
http://www.ihrc.fiu.edu/media/docs/10_Most_Hurricane_Vulnerable_Areas.pdf
- Kessler, R. C., Galea, S., Jones, R. T., & Parker, H. A. (2006). Mental illness and suicidality after Hurricane Katrina. *Bulletin of the World Health Organization*, 84(12),930-938.

- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer Publishing Company.
- Matthieu, M. M., & Ivanoff, A. (2006). Using Stress, Appraisal, and Coping Theories in Clinical Practice: Assessments of Coping Strategies After Disasters. *Brief Treatment and Crisis Intervention*, 6(4), 337- 348.
- Secor-Turner, M., & O'Boyle, C. (2006). Nurses and emergency disasters: What is known. *American Journal of Infection Control*, 34, 414-440.
- Smith, R. (2005, September 30). *Hurricane Katrina Recovery- Update #1*. Retrieved December 5, 2007, from http://www.lsuhsu.edu/biweekly/update_20050930.aspx
- Taylor, A. J. (1989). *Disaster and disaster stress (stress in modern society No. 10)*. NY: AMS.

Vita

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