PRIOR TO MATRICULATION, STUDENT REGISTERED NURSE ANESTHETIST STRESS MITIGATION BY PARTICIPATION IN AN ON BOARDING STUDENT-LED SESSION

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Dedication and Acknowledgements

This project is dedicated to all those that made this dream possible. First, to my husband, Chris, thank you for your endless love, support, and encouragement during this crazy, stressful journey. I could not have chased this dream without you by my side. To my family and friends, thank you all for your support and understanding while I have completed this 36-month program. To the nurse anesthesia faculty, thank you for your support and encouragement throughout this program. I am forever grateful.

Abstract

Background: Each year thousands of students across the country apply to nurse anesthesia programs. Due to the rigorous nature of the nurse anesthesia concentration, only a select few are accepted to each program. Nurse anesthesia school is highly stressful, and it is important to identify and decrease these stressors to ensure successful completion of the program. **Purpose:** The aim of this project was to evaluate whether providing an onboarding simulation day to first-year registered nurse anesthetist students prior to matriculation would decrease their stress levels. **Methods:** A quantitative design was used for this study. Participants for the intervention group were incoming first-year registered nurse anesthetist students. The control group consisted of current first-year registered nurse anesthetist students. Both groups attend the nurse anesthesia concentration at the local univeristy. Students participated in the same pre- and post-intervention survey that evaluated school-related, personal-related, and other stressors on a 5-point Likert scale. **Results:** A single ANOVA, f-tests, and t-tests were conducted, and 13 questions were analyzed. The overall stress score did not show a significance between the pre-intervention (M=3.00, SD=0.78) and post-intervention groups (M=2.86, SD=0.87); however, there was a statically significant improvement between the control (M=3.56, SD=0.75) and post-intervention groups (M=2.86, SD=0.87). **Conclusion:** My study suggests that providing first-year registered nurse anesthesia students an onboarding experience could be an effective way to decrease overall student stress scores.

Key Words: Stress, Student Nurse Anesthetist, Simulation

Background and Significance

Each year, thousands of critical care-trained registered nurses apply to nurse anesthesia programs across the country. Due to the rigor of each program, only a handful of applicants are accepted each year. Nurse anesthesia education programs are highly stressful, and student registered nurse anesthetists (SRNAs) face many stressors during their first year of school. Nurses that were once experts on their critical care units are now novice anesthesia providers. Chipas et al. (2012) reported that SRNAs ranked their overall stress levels a 7.2 out of a 10-point Likert scale, with females and minorities ranking their stress the highest. Chipas & Mckenna (2011) revealed that student stress is ranked a 7.2 out of a 10-point scale compared to practitioner's stress level of 4.7. In addition, Chipas et al, concluded that advanced practitioners have less stress than SRNAs. There are numerous reasons for these stress scores. Each nurse anesthesia program format is different; some programs are front-loaded, while some choose to incorporate an integrated format. Chipas et al. (2012) discovered that SRNAs attending an integrated program rated their stress higher than those attending a front-loaded program. Starcher (2008) revealed that stress from school stems from fear of unsuccessful completion of the board exam, fear of clinical error, and financial issues. In addition, Starcher states that interpersonal relationships during school may attenuate stress.

Purpose

The purpose of this project is to determine whether providing first-year SRNAs with an onboarding simulation experience prior to matriculation decreases the student's stress level. The potential benefits of the onboarding simulation day include providing familiarity with new medications and equipment used in the clinical setting and end-of-semester checkoffs. In

addition, simulation participants benefit from having a mentor who has experienced the stress and anxiety of anesthesia school firsthand.

Review of Current Evidence

A literature review was conducted to identify articles addressing stress mitigation in the SRNA by participating in a simulation provided by upper-class student mentors. PubMed and Proquest were chosen as primary sources. Search words included "stress in the student registered nurse anesthetist ", "student nurse anesthetist stress", "simulation and stress in the student nurse", and "nursing students and simulation". Inclusion criteria were peer-reviewed articles published in English. Due to a lack of recent studies, search criteria were expanded to studies conducted since 1985.

Student Registered Nurse Anesthetists' Stress

The terms stress and anxiety are frequently used interchangeably (McKay et al., 2010). Anxiety may be due to a lack of knowledge and skill regarding a particular topic and is associated with making mistakes (Chipas et al., 2012;Shearer, 2016). Stress is defined as a change resulting from any emotional, physical, social, economic, or other factor (Cantrell et al., 2017). It is essential for nurse anesthesia students to identify the cause of anxiety and stressors to apply mitigation strategies. It is crucial to understand that stress and the perception of stressors are unique to each student, their experience, and their ability to manage stress.

Compared to other healthcare-related specialties, nursing students have greater stress levels (Jimenez et al., 2010). Stress may be positive or negative; some stress is required to motivate the learner (Tunajek, 2006; Wildgust, 1986), but when stress exceeds an optimal level, it can lead to failure, unhappiness, and loss of economic stability (Wildgust,1986). Uncontrolled stress may lead to emotional or physical disease (Conner, 2016).

Stress in anesthesia school stems from high academic standards and the clinical setting. Anesthesia students are overloaded with lectures, skills practicums, and transitioning from expert to novice (Conner, 2016). In a study of eight junior and ten senior students enrolled in a two-year program, Wildgust (1986) identified several significant sources of stress, including academic, clinical, and social/personal categories. The study results revealed both student groups ranked academic overload as their highest stressor. The senior students' stress resulted mostly from the fear of failing the national certification exam, while junior students' stress stemmed from test anxiety and fear of failure. Perez and Perez (1999) concluded students in nurse anesthesia programs are either in mild, moderate, or major life crises, with most experiencing major life crises. According to their survey, 76% of students experienced a change in financial status and social engagement, which were primary sources of stress. Most academic stresses stemmed from needing to challenge the national certification exam, fear of clinical error, mental and physical exhaustion, and lack of leisure or social activities (Perez & Perez, 1999). Chipas et al., (2011) and Chipas and Mckenna (2012) conducted an additional study focused on students' stress and its effects, evaluating the current stress level and physical manifestations among CRNAs and SRNAs. Stress in school begins during the first semesters, levels off by semester five, and increases again in the final semester, originating from board examination preparation and job-seeking (Chipas et al., 2012).

To limit stress SRNAs must adopt positive coping strategies while avoiding maladaptive coping behaviors. Exercise is known to decrease stress levels and the physical manifestations of stress. SRNAs who exercise regularly have a substantial decrease in stress levels while in school (Chipas & McKenna, 2011; Chipas et al., 2012). Unfortunately, SRNAs often turn to harmful coping activities, such as substance and alcohol abuse, to help them cope with stress during their

programs (Chipas & Mckenna, 2011; Chipas et al., 2012). While students may use alcohol to cope with the physical manifestations of stress, negative coping behaviors make stressful situations worse.

Simulation

To prepare students to move from the didactic portion of their education to their clinical portion, many anesthesia schools have incorporated human-based simulation use into their programs (McKay et al., 2010). Student nurse anesthetists must transition from registered nurses working under a physician's direction to advanced practitioners who work autonomously, while making life and death decisions (Phillips, 2010). The use of simulation enables learners to practice in controlled settings with low stakes. Simulation allows students to receive feedback before entering the clinical area and encountering critical preceptors. Hollenbach (2016) and Yuan et al., (2011) concluded that students felt more prepared for the clinical experience due to having had a simulated clinical experience.

Students feel anxiety during their first clinical rotations (Chipas et al., 2012; Wunder, 2016). Simulation decreases anxiety while increasing students' confidence and skills when entering clinical practicums (Hollenbach, 2016; Yuan et al., 2011). Yuan et al., (2011) concluded clinical simulation increases students' confidence and clinical skills. Seymour (2016) completed a similar study and concluded that students who had received the simulation had reduced stress levels. Comparably, Head (2015) concluded that providing a mentor would help decrease stress.

While nursing students' stress is widely studied, there is little evidence specific to student nurse anesthetists' stressors. It is unknown whether an onboarding simulation would decrease the stress experienced by first-year SRNAs. The lack of evidence supports the need for our study.

Theoretical Framework

Betty Neuman's "Neuman Systems Model" views the client as an open system that responds to stressors of the environment (Reed Gerhrling, 1993). There are three significant elements of the Neuman Systems Model. These include the human being, the environment, and health. The human being in the open system responds to internal and external stressors. The environment can be internal, external, or created. The internal environment exists within the system, whereas the external system exists outside the system. The created environment is developed and implemented to support coping (Reed Gerhrling, 1993). In Neuman's theory, health is defined as the system's condition and ranges from being well to being ill. When needs are met, wellness exists. In contrast, when the system's needs are unmet, illness occurs.

The student nurse anesthetist will encounter many stressors in school. These stresses could be internal, external, or environmental. In addition to internal stressors the student experiences, students will encounter external and environmental stressors, including academic examinations, preparation for airway practicums, and countless skill check-offs. The goal is for human beings to have their needs met and to minimize stressors. This project aims to decrease stress in first year SRNAs and help maintain student wellness.

Methods

Design

This project used a quantitative design in the form of a pre and post-test survey to assess stress in the first-year SRNA before and after participating in a simulation onboarding experience. The study took place at the local university. The experimental group consisted of incoming first-year SRNAs scheduled to graduate in 2024. The control group was the current first-year cohort scheduled to graduate in 2023. The groups were not randomized, and there will

be no policy, procedure, or practice guidelines developed because of this project. Two senior SRNAs led the simulation experience which included airway set up, medication set up, and a basic introduction to the world of anesthesia. The simulation experience also included a perioperative simulation and hands-on familiarization experience with the anesthesia gas machine. In addition, the group leaders provided mentorship and a question-and-answer session.

Translational Framework

A modified version of the Iowa Model of Evidence-Based Practice to promote quality care was used for this project. The Iowa Model was developed in the 1990s at the University of Iowa Hospitals and Clinics (Brown, 2014). It serves as a guide to allow nurses to utilize research findings to improve patient care. There are eight steps to this model, each is summarized in Table 1.

Table 1

Iowa Model of Evidence-Based Practice

Step 1	Identify where an evidence-based practice change is needed	My project partner and I identified that stress in SRNAs is significant and considered how we could reduce it
Step 2	Determine if the presenting problem is a priority for the organization	Student mental health and decreasing stress is a priority for UNC-G.

Step 3	Form a team to develop, evaluate, and implement the evidence-based practice change	My project partner and I developed and implemented the onboarding. We evaluated SRNA stress and anxiety pre and post intervention
Step 4	Gather and analyze the research surrounding the wanted change in practice	I gathered research on SRNA stress and how simulation helps mitigate it
Step 5	Critique and combine the discovered research	I conducted a literature review on SRNA stress and simulation
Step 6	Decide if there is enough research to implement the change	There is enough research to support that simulation helps decrease nursing student stress
Step 7	If yes to step 6, implement a change into a pilot program	My partner and I developed the onboarding simulation for incoming first-year students
Step 8	Evaluate the results, and if the change is feasible, introduce the change to the organization	While the results were not statistically significant, feedback was positive

There is controversy in the literature regarding simulation effects on the student registered nurse anesthetists' stress levels prior to beginning classes. Therefore, the steps of the Iowa model were followed to assess if implementing an onboarding simulation day prior to matriculation decreases stress levels in first year SRNAs.

Permissions

The program director at the local university at the time of project implementation granted permission to utilize the classroom and simulation lab as the project site. The faculty of the nurse anesthesia department granted access to all required equipment, including but not limited to gas machines, mannequins, and intubation equipment.

Setting

The setting was a mid-major university in central North Carolina. The participant sample was expected to be approximately 60 SRNAs, including the control group of the class of 2023 and the experimental group of the class of 2024. This setting allowed for access to all equipment and simulation spaces needed to complete this project.

Sample

Students were recruited to participate in the study via email. The study sample was limited based on admission to the anesthesia program. Many studies have been completed for stress and anxiety in the student registered nurse anesthetists. However, the effects of an onboarding simulation to reduce stress prior to matriculation has not been studied. Inclusion criteria for the study included those accepted and matriculating into the CRNA program, as well as students in their first year of the program. Exclusion criteria included students in their second and/or third years of the program.

Intervention

The project was granted an exemption by the university IRB. Pre-simulation stress surveys were administered to the control group (class of 2023) via Qualtrics. Information sheets about the project were provided, and adequate time was given for answers. Due to COVID restrictions of no eating and drinking in the classroom, a $10 gift card was provided to the control group for completing the surveys. We could not be in person due to COVID restrictions, so a Zoom meeting was conducted to present our project to both groups. A recruitment email and information sheet were provided to the control group. The experimental group received the same information sheet via email. In addition, the experimental group was incentivized with a $10 gift card if the pre-simulation survey, simulation day, and post-simulation surveys were completed in their entirety before October 8, 2021. The experimental group participated in an onboarding simulation day led by two senior SRNAs, which included a peer-led simulation and didactic hybrid experience consisting of gas machine demonstration, airway equipment set-up, medication set-up, and an observation of perioperative care from the anesthesia perspective. Adequate time was given for a question-and-answer session following the simulation experience.

Data Collection

Data were collected via an online survey using Qualtrics. Data was kept on a password-protected computer in a locked room when not in the co-investigator's possession. Data was collected from the control group in the Spring of 2021. Data was collected from the experimental group in late Summer and early Fall of 2021. The intervention took place on August 10, 2021. Post-intervention surveys were sent out on September 25, 2021, to the experimental group, and responses were required by October 8, 2021. Information sheets were provided to both groups, and participation in this project was voluntary.

Instruments

All participants completed a pre- and post-intervention stress survey. The stress survey utilized was a modified version used with permission from the author (Starcher, 2008). The control group completed only the pre-intervention survey. The survey consisted of items to measure the stress they have experienced or anticipate experiencing in the categories of school-related stressors, personal-related stressors, and other specific stressors. The questions were measured on a Likert scale of 1-5, with 1 being no stress, 2 mild stress, 3 moderate stress, 4 highly stressful, and 5 extremely stressful. In addition, 15 questions obtained from the control pre-and post-intervention stress survey were measured and analyzed using descriptive statistics.

Data Analysis

Data were analyzed using Microsoft Excel. A single ANOVA test (alpha .05) was performed to assess for significance between the three groups (control, pre-intervention, and post-intervention). The data revealed there was significance between at least two groups on 13 out of 15 analyzed questions. Further analysis of the 13 remaining questions using an F-test (alpha.05) two sample for variances were ran to determine if the T-test (alpha 0.0167) needed to assume equal or unequal variances. Significance for each of the 13 questions were demonstrated. A Bonferroni adjustment was made to the alpha level of .05/3, resulting in an alpha of $P < 0.0167$ due to 3 pairs of tests. In addition, averages of each question were collected from the control and experimental group and compared to the post surveys of those that received the intervention and those that did not. Finally, a standard deviation was calculated by Qualtrics to assess for group agreement.

Budget, Time, Resources

Financial resources for rewarding the gift card for participation in the entirety of pre-survey, intervention, and post-survey and participation in the control survey were provided by the investigator and the co-investigator. In addition, the investigator and co-investigator split costs for the intervention group. The nurse anesthesia department provided clinical resources to implement this project. The project began in the spring of 2021 and was completed by the fall of 2021.

Results

Out of a potential 28 control subjects, three subjects did not complete the pre-intervention survey. There were twenty-five (N=25) students in the final control group that completed the pre-intervention survey. Demographic data are contained in Table 2 below. Demographic results included age and marital status. One participant did not answer the age or marriage demographic question. For the pre-intervention survey, a total of 26 participants answered the pre-intervention survey concerning most questions.

Demographic Data	Control group	Intervention group
Age 18-24	0	1
Age 25-34	24	22
Age 35-44	1	3
Married	7	16
Never Married	18	7
Divorced	0	2

Table 2 Demographic data

Twenty-two subjects participated in the post-intervention survey. A single ANOVA test was conducted. The results included 13 questions for significant data analysis ($P<0.05$). Further analysis with the use of an F-test two-sample for variances was done on the control, pre-intervention, and post-intervention data to determine which type of T-test to perform. If the one-tail P value multiplied by 2 was greater than 0.05, An equal variance T-test was performed. An

unequal variance T-test was performed if the one-tail P value multiplied by 2 was less than .05. For this project, averages and the standard deviations are listed in table 2 (school-related factors), table 3 (personal-related stress factors), and table 4 (specific stress factors) for each statistically significant question for the control, pre-intervention, and post-intervention data. Further data analysis, including the F-tests and T-tests for each question are provided in the appendices.

Stressor (school-related)	Control group Mean±SD	Pre-intervention group Mean±SD	Post-intervention group Mean±SD
Fear of Academic Failure	3.48±0.98	2.96±0.85	2.50±0.89
Fear of clinical error	4.40±0.63	3.50±1.08	2.91±0.85
Mental exhaustion	4.16±0.88	3.44±1.02	3.05±0.88
Successful on NCE	4.00±1.02	2.65±1.14	2.32±0.92
Preparedness as a competent practitioner	3.28±1.04	2.38±1.00	2.00±0.74

Table 3 School-related stressors

Stressor (personal-related)	Control group Mean±SD	Pre-intervention group Mean±SD	Post-intervention group Mean±SD
Knowledge to handle clinical situations 1st year	3.60±0.98	3.19±0.96	2.50±0.89

Table 4 Personal-related stressors

Stressor (specific)	Control group Mean±SD	Pre-intervention group Mean±SD	Post-intervention group Mean±SD
Exams of the course	3.80±0.94	3.54±0.69	2.73±1.05
Workload of the course	3.40±0.98	3.58±0.79	2.68±0.82
Financial constraints of the course	3.36±1.16	2.88±1.19	2.41±1.03

Travel requirements	3.72±0.87	3.27±1.13	2.55±0.78
Relationship with hospital staff	3.36±1.13	2.58±0.63	2.09±0.73
Relationship with preceptors	3.56±1.13	2.81±0.79	2.27±0.81

Table 5 Specific stressors

An overall stress score was calculated for the control, pre-intervention, and post-intervention group. For the control group, the mean stress score was 3.56±0.75. For the pre-intervention group, the mean stress score was 3.00±0.78, and for the post-intervention group, the mean stress score was 2.86±0.87.

Discussion

The purpose of this study was to assess whether an onboarding simulation experience would decrease the stress of incoming first year SRNAs. There were three different types of stressors assessed in the control, pre-intervention, and post-intervention groups. These included school-related stressors, personal-related stressors, and specific stressors. The same surveys were administered to each group. The hypothesis was that providing the incoming first year SRNAs an onboarding simulation would decrease their stress level. The quantitative data obtained from the control, pre-intervention, and post-intervention groups demonstrated a statistical improvement in overall stress score between the control and pre-intervention group as well as the control and post-intervention group. The pre-intervention and post-intervention groups did not show a statistically significant change. As found in Wildgust's (1986) study, our study concluded that first year students' stress was higher concerning successful completion of the national certification exam than first-year students. A reason for this could be that the first-year students feel the stress of the upcoming exam, whereas the exam is not a current concern for the incoming

first-year students. Unlike Wildgust's study, academic failure did not seem to be a significant concern for either group. Perez and Perez (1996) concluded that financial stress was a source of stress for the students in their study. Our study built upon that conclusion, with financial stress identified as a stressor for current first and incoming first-year nurse anesthesia students. The current first year students ranked their stress regarding financial constraints at 3.36, whereas the incoming first-year nurse anesthesia students rated their stress a mean score of 2.41. This discrepancy could be explained by the requirement of current first-year students to travel to out-of-town clinical sites, while the incoming first-year students do not. Another concern that showed statistical significance was fear of clinical error. Seymour (2016) concluded that simulation decreased students' stress levels related to clinical error. Our study drew similar results. The control group's average stress score for fear of clinical error was 4.40. The pre-intervention stress score was 3.50, and the post-intervention stress score for fear of clinical error was 2.91. These results further support our initial hypothesis. Mental exhaustion was also a stressor for both groups. The current first-year students rated this stressor 4.16, whereas the average score of the pre-intervention group was 3.44 and the post-intervention average score of 3.05. Current first-year students have been through an entire year of classes, whereas the incoming first-year students had started their first semester when the post-intervention scores were obtained. Preparedness was also a source of stress for the control group, with an average stress score of 3.28. The post-intervention average stress score was 2.00. Current first-year students are beginning to feel the importance of being perceived as competent practitioners having gained experience in the clinical setting, the intervention group has yet to experience this setting. The stressor of relationships with significant others did not show significance for either group. The ability to manage clinical situations during the first year was not significant between

the control and pre-intervention but was significant between the pre-and post-intervention groups. The first-year students had completed their first-year clinical rotations, but the incoming first-year students had not begun clinical rotations at the time of the project's implementation. The average score of the pre-intervention group was 3.19. The average score of the post-intervention group was 2.50. This finding of decreased stress scores supports the conclusion of Hollenbach (2016) and Yuan (2011). Course examinations were a stressor for both the control and intervention groups. The control group rated examination stress at an average of 3.80, whereas the pre-intervention group rated them an average of 3.54. The post-intervention score was 2.73. Course workload was also rated similarly. The control group rated stress of course workload an average of 3.80. The pre-intervention group scored course workload stress a 3.54, and the post-intervention group rated this stressor a 2.73. These results are like the findings of Wildgust's study (1986). The decrease in stress scores may stem from the question-and-answer session provided by the upper-class mentors. This finding supports the study performed by Head (2015) that concludes providing a mentor would help decrease stress.

Although the data did not support a significant change between the pre-and post-intervention groups, there was a significant improvement comparing the control and post-intervention group. In addition, 90% of the respondents emailed the primary and co-investigators, stating they felt the simulation onboarding day was beneficial in reducing their stress and anxiety. They also felt the onboarding class should continue for future classes.

Limitations

This study had several limitations. First, the sample was a convenience sample at a mid-major university. The sample size was small and included only nurse anesthesia students. The study was voluntary, so the research findings relied on the completed surveys. Some participants

did not answer all questions on the survey, which could have influenced the results. In the intervention group, only 22 participants completed the post-intervention survey. If the additional participants in the simulation completed the post-intervention stress survey, results might have been altered. In addition, the control group was asked to answer questions retrospectively in relation to their stressors. The retroactive approach may have skewed data. The subjects in the study were of varying ages and maturity levels and may have different coping strategies. The study had to be completed in a specific time frame, so these constraints did not allow stress assessment once the intervention group began their clinical rotations, a high-stress time for nursing students (Chipas et al., 2012; Wunder, 2016). Another barrier to implementing this project were the effects of COVID-19.

Recommendations for Future Study

Our data suggest that the onboarding simulation day did not cause a significant decrease in stress between the pre-intervention and post-intervention groups. However, it did show a significant decrease in stress in the control group versus the pre-intervention and the post-intervention groups. A future study could be implemented earlier, and a post-assessment could occur later in the semester, perhaps after clinical check-offs or after the first week in the clinical setting. This study would allow for a parallel consideration of the skills learned in the simulation and skills evaluation by program faculty. In addition, further studies could be undertaken to assess the student's specific stressors and coping strategies across the different cohorts. As each individual manages stress differently, it is essential to understand how each participant views stress and evaluate their coping mechanisms.

Relevance and Recommendations for Clinical Practice

This project demonstrated that the use of a didactic, hybrid onboarding experience consisting of gas machine familiarization, medication set-up, perioperative anesthesia experience, and a question-and-answer session provided by upper-class mentors decreased stress between the control group and pre-intervention post-intervention groups. Although there was no significant change in the pre-intervention and post-intervention groups, the results show that providing this simulation experience does decrease stress and should be implemented in future cohorts.

Conclusion

As student registered nurse anesthetists progress through their programs, the stressors they experience change. They become more comfortable with their educational and clinical experiences. This study sought to assess if providing an onboarding simulation would decrease stress in first-year registered nurse anesthesia students. Published literature supports simulation as an avenue to increase students' confidence with their clinical skills (Yuan et. al, 2011). Seymour (2016) determined simulation decreases student stress. Our study revealed similar findings. Stress was decreased between the control and post-intervention group. This study was unique in that it encompassed elements of a project as well as research. The research findings demonstrated a difference in stress scores based on various factors and the stress experienced is unique to each student cohort. It was our goal to decrease stress in first year SRNAs. Based on the projects reception and the feedback we received it is our recommendation that the university implement an onboarding simulation experience led by upperclassmen for first year student registered nurse anesthetists to decrease their stress levels.

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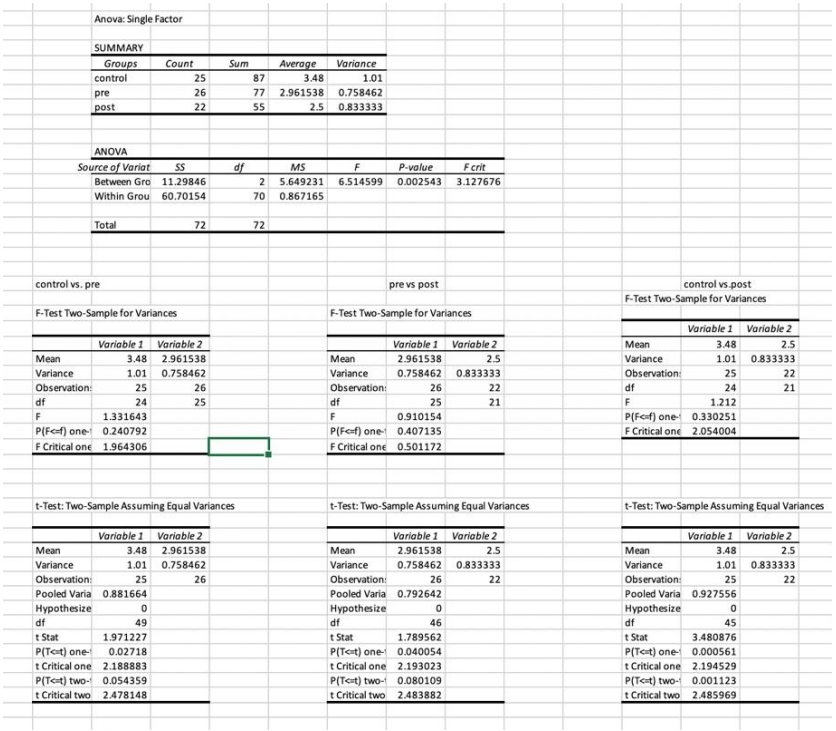
Appendix A

Results of single factor ANOVA, F-test, and T-test for analyzed data

Fear of academic failure



Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	87	3.48	1.01
pre	26	77	2.961538	0.758462
post	22	55	2.5	0.833333

ANOVA

Source of Variat	SS	df	MS	F	P-value	F crit
Between Gro	11.29846	2	5.649231	6.514599	0.002543	3.127676
Within Grou	60.70154	70	0.867165			
Total	72	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.48	2.961538
Variance	1.01	0.758462
Observation:	25	26
df	24	25
F	1.331643	
P(F<=f) one-	0.240792	
F Critical one	1.964306	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.48	2.961538
Variance	1.01	0.758462
Observation:	25	26
Pooled Varia	0.881664	
Hypothesize	0	
df	49	
t Stat	1.971227	
P(T<=t) one-	0.02718	
t Critical one	2.188883	
P(T<=t) two-	0.054359	
t Critical two	2.478148	

pre vs post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	2.961538	2.5
Variance	0.758462	0.833333
Observation:	26	22
df	25	21
F	0.910154	
P(F<=f) one-	0.407135	
F Critical one	0.501172	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	2.961538	2.5
Variance	0.758462	0.833333
Observation:	26	22
Pooled Varia	0.792642	
Hypothesize	0	
df	46	
t Stat	1.789562	
P(T<=t) one-	0.040054	
t Critical one	2.193023	
P(T<=t) two-	0.080109	
t Critical two	2.483882	

control vs.post

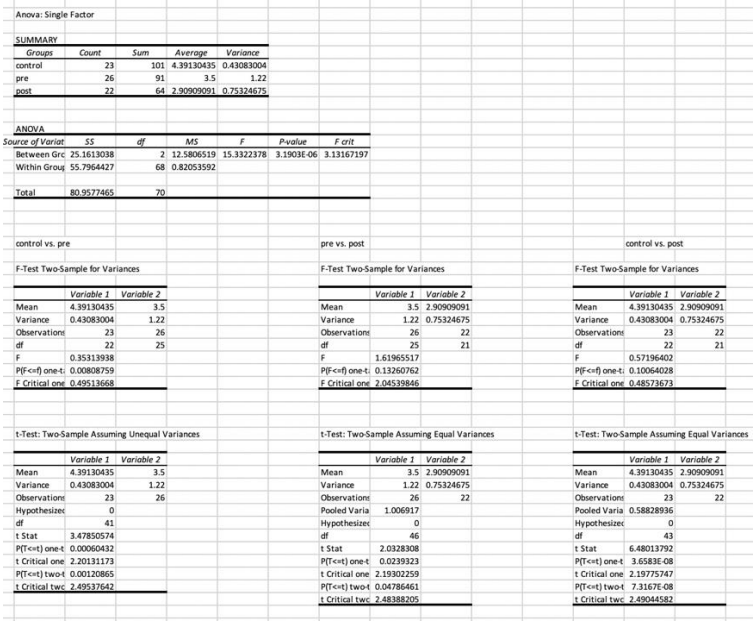
F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.48	2.5
Variance	1.01	0.833333
Observation:	25	22
df	24	21
F	1.212	
P(F<=f) one-	0.330251	
F Critical one	2.054004	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.48	2.5
Variance	1.01	0.833333
Observation:	25	22
Pooled Varia	0.927556	
Hypothesize	0	
df	45	
t Stat	3.480876	
P(T<=t) one-	0.000561	
t Critical one	2.194529	
P(T<=t) two-	0.001123	
t Critical two	2.485969	

Fear of clinical error



Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	23	101	4.39130435	0.43083004
pre	26	91	3.5	1.22
post	22	64	2.90909091	0.75324675

ANOVA

Source of Variat	SS	df	MS	F	P-value	F crit
Between Gro	25.1613038	2	12.5806519	15.3322378	3.1903E-06	3.13167197
Within Grou	55.7964427	68	0.82053592			
Total	80.9577465	70				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4.39130435	3.5
Variance	0.43083004	1.22
Observations	23	26
df	22	25
F	0.35313938	
P(F<=f) one-t	0.00808759	
F Critical one	0.49513668	

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	Variable 2
Mean	4.39130435	3.5
Variance	0.43083004	1.22
Observations	23	26
Hypothesized	0	
df	41	
t Stat	3.47850574	
P(T<=t) one-t	0.00060432	
t Critical one	2.20131173	
P(T<=t) two-t	0.00120865	
t Critical two	2.49537642	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.5	2.90909091
Variance	1.22	0.75324675
Observations	26	22
df	25	21
F	1.61965517	
P(F<=f) one-t	0.13260762	
F Critical one	2.04539846	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.5	2.90909091
Variance	1.22	0.75324675
Observations	26	22
Pooled Varia	1.006917	
Hypothesized	0	
df	46	
t Stat	2.0328308	
P(T<=t) one-t	0.0239323	
t Critical one	2.19302259	
P(T<=t) two-t	0.04786461	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4.39130435	2.90909091
Variance	0.43083004	0.75324675
Observations	23	22
df	22	21
F	0.57196402	
P(F<=f) one-t	0.10064028	
F Critical one	0.48573673	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	4.39130435	2.90909091
Variance	0.43083004	0.75324675
Observations	23	22
Pooled Varia	0.58828936	
Hypothesized	0	
df	43	
t Stat	6.48013792	
P(T<=t) one-t	3.6583E-08	
t Critical one	2.19775747	
P(T<=t) two-t	7.3167E-08	
t Critical two	2.49044582	

Mental Exhaustion

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	104	4.16	0.8066667
pre	25	86	3.44	1.09
post	22	67	3.0454545	0.8073593

ANOVA

Source of Variat	SS	df	MS	F	P-value	F crit
Between Gr	15.178232	2	7.5891162	8.3817979	0.0005512	3.129644
Within Grou	62.474545	69	0.9054282			
Total	77.652778	71				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4.16	3.44
Variance	0.8066667	1.09
Observation	25	25
df	24	24
F	0.7400612	
P(F<=f) one-t	0.2331976	
F Critical on	0.5040933	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	4.16	3.44
Variance	0.8066667	1.09
Observation	25	25
Pooled Varia	0.9483333	
Hypothesize	0	
df	48	
t Stat	2.6140085	
P(T<=t) one-	0.0059592	
t Critical one	2.1902041	
P(T<=t) two-	0.0119185	
t Critical tw	2.4799774	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.44	3.0454545
Variance	1.09	0.8073593
Observation	25	22
df	24	21
F	1.3500804	
P(F<=f) one-t	0.2452832	
F Critical on	2.0540043	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.44	3.0454545
Variance	1.09	0.8073593
Observation	25	22
Pooled Varia	0.958101	
Hypothesize	0	
df	45	
t Stat	1.3788716	
P(T<=t) one-	0.0873751	
t Critical one	2.1945286	
P(T<=t) two-	0.1747502	
t Critical tw	2.4859692	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4.16	3.0454545
Variance	0.8066667	0.8073593
Observation	25	22
df	24	21
F	0.9991421	
P(F<=f) one-t	0.4954288	
F Critical on	0.4963803	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	4.16	3.0454545
Variance	0.8066667	0.8073593
Observation	25	22
Pooled Varia	0.8069899	
Hypothesize	0	
df	45	
t Stat	4.244203	
P(T<=t) one-	5.41E-05	
t Critical one	2.1945286	
P(T<=t) two-	0.0001082	
t Critical tw	2.4859692	

Successful completion of the national certification exam

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	100	4	1.0833333
pre	26	69	2.6538462	1.3553846
post	22	51	2.3181818	0.8939394

ANOVA

Source of Variat	SS	df	MS	F	P-value	F crit
Between Gr	38.328959	2	19.164479	17.05516	9.25E-07	3.1276756
Within Grou	78.657343	70	1.1236763			
Total	116.9863	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4	2.6538462
Variance	1.0833333	1.3553846
Observation	25	26
df	24	25
F	0.7992811	
P(F<=f) one-t	0.2928807	
F Critical on	0.5063395	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	4	2.6538462
Variance	1.0833333	1.3553846
Observation	25	26
Pooled Varia	1.222135	
Hypothesize	0	
df	49	
t Stat	4.3471707	
P(T<=t) one-	3.474E-05	
t Critical one	2.1888835	
P(T<=t) two-	6.947E-05	
t Critical tw	2.4781485	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	2.68	2.3181818
Variance	1.3933333	0.8939394
Observation	25	22
df	24	21
F	1.5586441	
P(F<=f) one-t	0.153854	
F Critical on	2.0540043	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	2.6538462	2.3181818
Variance	1.3553846	0.8939394
Observation	26	22
Pooled Varia	1.1447248	
Hypothesize	0	
df	46	
t Stat	1.0830089	
P(T<=t) one-	0.1422244	
t Critical one	2.1930226	
P(T<=t) two-	0.2844488	
t Critical tw	2.483882	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	4	2.3181818
Variance	1.0833333	0.8939394
Observation	25	22
df	24	21
F	1.2118644	
P(F<=f) one-t	0.330345	
F Critical on	2.0540043	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	4	2.3181818
Variance	1.0833333	0.8939394
Observation	25	22
Pooled Varia	0.9949495	
Hypothesize	0	
df	45	
t Stat	5.7678099	
P(T<=t) one-	3.448E-07	
t Critical one	2.1945286	
P(T<=t) two-	6.897E-07	
t Critical tw	2.4859692	

Preparedness as a competent practitioner

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	82	3.28	1.12666667
pre	26	62	2.38461538	1.04615385
post	22	44	2	0.57142857

ANOVA

Source of Variat	SS	df	MS	F	P-value	F crit
Between Grc	20.6417703	2	10.3208851	11.0817508	6.5897E-05	3.1276756
Within Grou	65.1938462	70	0.93134066			
Total	85.8356164	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.28	2.38461538
Variance	1.12666667	1.04615385
Observations	25	26
df	24	25
F	1.07696078	
P(F<=f) one-t	0.426856	
F Critical one	1.96430563	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.28	2.38461538
Variance	1.12666667	1.04615385
Observations	25	26
Pooled Varia	1.0855887	
Hypothesized	0	
df	49	
t Stat	3.06795201	
P(T<=t) one-t	0.00175294	
t Critical one	2.18888346	
P(T<=t) two-t	0.00350587	
t Critical two	2.47814848	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	2.38461538	2
Variance	1.04615385	0.57142857
Observations	26	22
df	25	21
F	1.83076923	
P(F<=f) one-t	0.08162063	
F Critical one	2.04539846	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	2.38461538	2
Variance	1.04615385	0.57142857
Observations	26	22
Pooled Varia	0.82943144	
Hypothesized	0	
df	46	
t Stat	1.45785322	
P(T<=t) one-t	0.07583746	
t Critical one	2.19302259	
P(T<=t) two-t	0.15167491	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.28	2
Variance	1.12666667	0.57142857
Observations	25	22
df	24	21
F	1.97166667	
P(F<=f) one-t	0.06018477	
F Critical one	2.05400431	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.28	2
Variance	1.12666667	0.57142857
Observations	25	22
Pooled Varia	0.86755556	
Hypothesized	0	
df	45	
t Stat	4.70103774	
P(T<=t) one-t	1.2358E-05	
t Critical one	2.19452863	
P(T<=t) two-t	2.4716E-05	
t Critical two	2.48596923	

Knowledge to handle clinical situations first year

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	82	3.28	1.12666667
pre	26	62	2.38461538	1.04615385
post	22	44	2	0.57142857

ANOVA

Source of Variat	SS	df	MS	F	P-value	F crit
Between Grc	20.6417703	2	10.3208851	11.0817508	6.5897E-05	3.1276756
Within Grou	65.1938462	70	0.93134066			
Total	85.8356164	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.28	2.38461538
Variance	1.12666667	1.04615385
Observations	25	26
df	24	25
F	1.07696078	
P(F<=f) one-t	0.426856	
F Critical one	1.96430563	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.28	2.38461538
Variance	1.12666667	1.04615385
Observations	25	26
Pooled Varia	1.0855887	
Hypothesized	0	
df	49	
t Stat	3.06795201	
P(T<=t) one-t	0.00175294	
t Critical one	2.18888346	
P(T<=t) two-t	0.00350587	
t Critical two	2.47814848	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	2.38461538	2
Variance	1.04615385	0.57142857
Observations	26	22
df	25	21
F	1.83076923	
P(F<=f) one-t	0.08162063	
F Critical one	2.04539846	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	2.38461538	2
Variance	1.04615385	0.57142857
Observations	26	22
Pooled Varia	0.82943144	
Hypothesized	0	
df	46	
t Stat	1.45785322	
P(T<=t) one-t	0.07583746	
t Critical one	2.19302259	
P(T<=t) two-t	0.15167491	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.28	2
Variance	1.12666667	0.57142857
Observations	25	22
df	24	21
F	1.97166667	
P(F<=f) one-t	0.06018477	
F Critical one	2.05400431	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.28	2
Variance	1.12666667	0.57142857
Observations	25	22
Pooled Varia	0.86755556	
Hypothesized	0	
df	45	
t Stat	4.70103774	
P(T<=t) one-t	1.2358E-05	
t Critical one	2.19452863	
P(T<=t) two-t	2.4716E-05	
t Critical two	2.48596923	

Course Examinations

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	85	3.4	1
pre	26	93	3.57692308	0.65384615
post	22	59	2.68181818	0.7034632

ANOVA

Source of Variati	SS	df	MS	F	P-value	F crit
Between Gro	10.4427627	2	5.22138136	6.63106158	0.00230552	3.1276756
Within Group	55.1188811	70	0.78741259			
Total	65.5616438	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.4	3.57692308
Variance	1	0.65384615
Observations	25	26
df	24	25
F	1.52941176	
P(F<=f) one-ta	0.14892567	
F Critical one	1.96430563	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.4	3.57692308
Variance	1	0.65384615
Observations	25	26
Pooled Variai	0.82339089	
Hypothesizec	0	
df	49	
t Stat	-0.6960702	
P(T<=t) one-t	0.24483675	
t Critical one	2.18888346	
P(T<=t) two-t	0.48967351	
t Critical two	2.47814848	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.57692308	2.68181818
Variance	0.65384615	0.7034632
Observations	26	22
df	25	21
F	0.92946746	
P(F<=f) one-ta	0.42653394	
F Critical one	0.50117222	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.57692308	2.68181818
Variance	0.65384615	0.7034632
Observations	26	22
Pooled Variai	0.67649742	
Hypothesizec	0	
df	46	
t Stat	3.75680157	
P(T<=t) one-t	0.00024162	
t Critical one	2.19302259	
P(T<=t) two-t	0.00048324	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.4	2.68181818
Variance	1	0.7034632
Observations	25	22
df	24	21
F	1.42153846	
P(F<=f) one-ta	0.20940892	
F Critical one	2.05400431	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.4	2.68181818
Variance	1	0.7034632
Observations	25	22
Pooled Variai	0.86161616	
Hypothesizec	0	
df	45	
t Stat	2.64673161	
P(T<=t) one-t	0.00558024	
t Critical one	2.19452863	
P(T<=t) two-t	0.01116049	
t Critical two	2.48596923	

Course Workload

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	85	3.4	1
pre	26	93	3.57692308	0.65384615
post	22	59	2.68181818	0.7034632

ANOVA

Source of Variati	SS	df	MS	F	P-value	F crit
Between Gro	10.4427627	2	5.22138136	6.63106158	0.00230552	3.1276756
Within Group	55.1188811	70	0.78741259			
Total	65.5616438	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.4	3.57692308
Variance	1	0.65384615
Observations	25	26
df	24	25
F	1.52941176	
P(F<=f) one-ta	0.14892567	
F Critical one	1.96430563	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.4	3.57692308
Variance	1	0.65384615
Observations	25	26
Pooled Variai	0.82339089	
Hypothesizec	0	
df	49	
t Stat	-0.6960702	
P(T<=t) one-t	0.24483675	
t Critical one	2.18888346	
P(T<=t) two-t	0.48967351	
t Critical two	2.47814848	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.57692308	2.68181818
Variance	0.65384615	0.7034632
Observations	26	22
df	25	21
F	0.92946746	
P(F<=f) one-ta	0.42653394	
F Critical one	0.50117222	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.57692308	2.68181818
Variance	0.65384615	0.7034632
Observations	26	22
Pooled Variai	0.67649742	
Hypothesizec	0	
df	46	
t Stat	3.75680157	
P(T<=t) one-t	0.00024162	
t Critical one	2.19302259	
P(T<=t) two-t	0.00048324	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.4	2.68181818
Variance	1	0.7034632
Observations	25	22
df	24	21
F	1.42153846	
P(F<=f) one-ta	0.20940892	
F Critical one	2.05400431	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.4	2.68181818
Variance	1	0.7034632
Observations	25	22
Pooled Variai	0.86161616	
Hypothesizec	0	
df	45	
t Stat	2.64673161	
P(T<=t) one-t	0.00558024	
t Critical one	2.19452863	
P(T<=t) two-t	0.01116049	
t Critical two	2.48596923	

Financial constraints of the course

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	84	3.36	1.406667
pre	26	75	2.884615	1.466154
post	22	53	2.409091	1.11039

ANOVA

Source of Variat	SS	df	MS	F	P-value	F crit
Between Gro	10.59674	2	5.29837	3.956874	0.023547	3.127676
Within Grou	93.73203	70	1.339029			
Total	104.3288	72				

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.36	2.884615
Variance	1.406667	1.466154
Observation	25	26
df	24	25
F	0.959426	
P(F<=f) one-	0.460703	
F Critical one	0.50634	

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	2.884615	2.409091
Variance	1.466154	1.11039
Observation	26	22
df	25	21
F	1.320396	
P(F<=f) one-	0.260799	
F Critical one	2.045398	

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.36	2.409091
Variance	1.406667	1.11039
Observation	25	22
df	24	21
F	1.266823	
P(F<=f) one-	0.293918	
F Critical one	2.054004	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.36	2.884615
Variance	1.406667	1.466154
Observation	25	26
Pooled Varia	1.437017	
Hypothesize	0	
df	49	
t Stat	1.415747	
P(T<=t) one-	0.081587	
t Critical one	2.188883	
P(T<=t) two-	0.163175	
t Critical two	2.478148	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	2.884615	2.409091
Variance	1.466154	1.11039
Observation	26	22
Pooled Varia	1.30374	
Hypothesize	0	
df	46	
t Stat	1.437655	
P(T<=t) one-	0.07865	
t Critical one	2.193023	
P(T<=t) two-	0.1573	
t Critical two	2.483882	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.36	2.409091
Variance	1.406667	1.11039
Observation	25	22
Pooled Varia	1.268404	
Hypothesize	0	
df	45	
t Stat	2.888302	
P(T<=t) one-	0.002968	
t Critical one	2.194529	
P(T<=t) two-	0.005936	
t Critical two	2.485969	

Travel requirements of the course

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	93	3.72	0.79333333
pre	26	85	3.26923077	1.32461538
post	22	56	2.54545455	0.64069264

ANOVA

urce of Variat	SS	df	MS	F	P-value	F crit
Between Gr	16.3078781	2	8.15393907	8.69953275	0.00042237	3.1276756
Within Grou	65.6099301	70	0.93728472			
Total	81.9178082	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.72	3.26923077
Variance	0.79333333	1.32461538
Observation	25	26
df	24	25
F	0.59891599	
P(F<=f) one-t	0.10675611	
F Critical one	0.50633952	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.72	3.26923077
Variance	0.79333333	1.32461538
Observation	25	26
Pooled Varia	1.0643956	
Hypothesize	0	
df	49	
t Stat	1.5598194	
P(T<=t) one-t	0.06261932	
t Critical one	2.18888346	
P(T<=t) two-	0.12523864	
t Critical two	2.47814848	

pre. Vs post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.26923077	2.54545455
Variance	1.32461538	0.64069264
Observation	26	22
df	25	21
F	2.06747401	
P(F<=f) one-t	0.04756189	
F Critical one	2.04539846	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.26923077	2.54545455
Variance	1.32461538	0.64069264
Observation	26	22
Pooled Varia	1.01238978	
Hypothesize	0	
df	46	
t Stat	2.48317788	
P(T<=t) one-t	0.00836452	
t Critical one	2.19302259	
P(T<=t) two-	0.01672905	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.72	2.54545455
Variance	0.79333333	0.64069264
Observation	25	22
df	24	21
F	1.23824324	
P(F<=f) one-t	0.31241968	
F Critical one	2.05400431	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.72	2.54545455
Variance	0.79333333	0.64069264
Observation	25	22
Pooled Varia	0.72210101	
Hypothesize	0	
df	45	
t Stat	4.72828088	
P(T<=t) one-t	1.1301E-05	
t Critical one	2.19452863	
P(T<=t) two-	2.2601E-05	
t Critical two	2.48596923	

Relationship with hospital staff

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	84	3.36	1.32333333
pre	26	67	2.57692308	0.41384615
post	22	46	2.09090909	0.56277056

ANOVA

ource of Variat	SS	df	MS	F	P-value	F crit
Between Gro	19.4455273	2	9.72276367	12.6212674	2.0862E-05	3.1276756
Within Group	53.9243357	70	0.77034765			
Total	73.369863	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.36	2.57692308
Variance	1.32333333	0.41384615
Observations	25	26
df	24	25
F	3.1976456	
P(F<=f) one-ta	0.00266644	
F Critical one	1.96430563	

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	Variable 2
Mean	3.36	2.57692308
Variance	1.32333333	0.41384615
Observations	25	26
Hypothesized	0	
df	37	
t Stat	2.98435785	
P(T<=t) one-ta	0.00250582	
t Critical one-	2.20961526	
P(T<=t) two-t	0.00501165	
t Critical two	2.506907	

pre vs post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	2.57692308	2.09090909
Variance	0.41384615	0.56277056
Observations	26	22
df	25	21
F	0.73537278	
P(F<=f) one-ta	0.2295479	
F Critical one	0.50117222	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	2.57692308	2.09090909
Variance	0.41384615	0.56277056
Observations	26	22
Pooled Varia	0.48183338	
Hypothesized	0	
df	46	
t Stat	2.41700595	
P(T<=t) one-ta	0.00983585	
t Critical one	2.19302259	
P(T<=t) two-t	0.01967169	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.36	2.09090909
Variance	1.32333333	0.56277056
Observations	25	22
df	24	21
F	2.35146154	
P(F<=f) one-ta	0.02588905	
F Critical one	2.05400431	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.36	2.09090909
Variance	1.32333333	0.56277056
Observations	25	22
Pooled Varia	0.96840404	
Hypothesized	0	
df	45	
t Stat	4.41160736	
P(T<=t) one-ta	3.1663E-05	
t Critical one	2.19452863	
P(T<=t) two-t	6.3327E-05	
t Critical two	2.48596923	

Relationship with preceptor

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
control	25	89	3.56	1.34
pre	26	73	2.80769231	0.64153846
post	22	50	2.27272727	0.68398268

ANOVA

urce of Variat	SS	df	MS	F	P-value	F crit
Between Gro	19.7666692	2	9.88333461	11.0583476	6.7079E-05	3.1276756
Within Group	62.5620979	70	0.89374426			
Total	82.3287671	72				

control vs. pre

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.56	2.80769231
Variance	1.34	0.64153846
Observations	25	26
df	24	25
F	2.08872902	
P(F<=f) one-t	0.03660515	
F Critical one	1.96430563	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.56	2.80769231
Variance	1.34	0.64153846
Observations	25	26
Pooled Varia	0.98364207	
Hypothesize	0	
df	49	
t Stat	2.70799928	
P(T<=t) one-t	0.00464759	
t Critical one	2.18888346	
P(T<=t) two-	0.00929518	
t Critical two	2.47814848	

pre vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	2.80769231	2.27272727
Variance	0.64153846	0.68398268
Observations	26	22
df	25	21
F	0.93794547	
P(F<=f) one-t	0.43497826	
F Critical one	0.50117222	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	2.80769231	2.27272727
Variance	0.64153846	0.68398268
Observations	26	22
Pooled Varia	0.66091517	
Hypothesize	0	
df	46	
t Stat	2.27158992	
P(T<=t) one-t	0.01391737	
t Critical one	2.19302259	
P(T<=t) two-	0.02783473	
t Critical two	2.48388205	

control vs. post

F-Test Two-Sample for Variances

	Variable 1	Variable 2
Mean	3.56	2.27272727
Variance	1.34	0.68398268
Observations	25	22
df	24	21
F	1.95911392	
P(F<=f) one-t	0.06191604	
F Critical one	2.05400431	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	Variable 2
Mean	3.56	2.27272727
Variance	1.34	0.68398268
Observations	25	22
Pooled Varia	1.03385859	
Hypothesize	0	
df	45	
t Stat	4.33084275	
P(T<=t) one-t	4.1035E-05	
t Critical one	2.19452863	
P(T<=t) two-	8.207E-05	
t Critical two	2.48596923	

Overall stress score

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
control	25	89	3.56	0.59
pre	26	78	3	0.64
post	22	63	2.86363636	0.79004329

ANOVA

Source of Variat	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Grc	6.59155666	2	3.29577833	4.9347593	0.00988767	3.1276756
Within Grou	46.7509091	70	0.66787013			
Total	53.3424658	72				

control vs pre

F-Test Two-Sample for Variances

	Variable 1	*Variable 2*
Mean	3.56	3
Variance	0.59	0.64
Observations	25	26
df	24	25
F	0.921875	
P(F<=f) one-t	0.42215333	
F Critical one	0.50633952	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	*Variable 2*
Mean	3.56	3
Variance	0.59	0.64
Observations	25	26
Pooled Varia	0.6155102	
Hypothesizec	0	
df	49	
t Stat	2.54824974	
P(T<=t) one-t	0.00700595	
t Critical one	2.18888346	
P(T<=t) two-t	0.01401189	
t Critical two	2.47814848	

pre vs post

F-Test Two-Sample for Variances

	Variable 1	*Variable 2*
Mean	3	2.86363636
Variance	0.64	0.79004329
Observations	26	22
df	25	21
F	0.81008219	
P(F<=f) one-t	0.30469319	
F Critical one	0.50117222	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	*Variable 2*
Mean	3	2.86363636
Variance	0.64	0.79004329
Observations	26	22
Pooled Varia	0.70849802	
Hypothesizec	0	
df	46	
t Stat	0.55925084	
P(T<=t) one-t	0.2893517	
t Critical one	2.19302259	
P(T<=t) two-t	0.5787034	
t Critical two	2.48388205	

control vsl post

F-Test Two-Sample for Variances

	Variable 1	*Variable 2*
Mean	3.56	2.86363636
Variance	0.59	0.79004329
Observations	25	22
df	24	21
F	0.74679452	
P(F<=f) one-t	0.24392614	
F Critical one	0.49638026	

t-Test: Two-Sample Assuming Equal Variances

	Variable 1	*Variable 2*
Mean	3.56	2.86363636
Variance	0.59	0.79004329
Observations	25	22
Pooled Varia	0.68335354	
Hypothesizec	0	
df	45	
t Stat	2.88168017	
P(T<=t) one-t	0.00302095	
t Critical one	2.19452863	
P(T<=t) two-t	0.0060419	
t Critical two	2.48596923	

Appendix B

Stress and the Anesthesia Student Questionnaire

1. **Age _____**
2. **Marital Status. S___ M___ D___W___**

I.

II.

Please rate source of stress (school stress factors) on a scale of 1-5, with 1 being no stress, 2 being mild stress, 3 being moderate stress, 4 being highly stressful, and 5 being extremely stressful

1. **Fear of Dismissal _____**
2. **Fear of Academic failure _____**
3. **Fear of instructors' perception of being incompetent _____**
4. **Fear of clinical error _____**
5. **Written clinical evaluations of performance _____**
6. **Ongoing personal conflict with a specific instructor _____**
7. **Ongoing personal peer conflict _____**
8. **Mental exhaustion _____**
9. **Physical exhaustion _____**
10. **Ineffective time management _____**
11. **Adjusting to different styles of instruction _____**
12. **Lack of autonomy and control over schedule and assignments _____**
13. **Fear of reprimand for utilizing open-door policy _____**
14. **Successful completion of the national certification exam _____**
15. **Preparedness for graduation as a competent practitioner _____**
16. **Expected Vigilance despite increased fatigue and workload _____**
17. **Other (please specify)_____**

_____

Please rate source of stress (personal stress factors) on a scale of 1-5, with 1 being no stress, 2 being mild stress, 3 being moderate stress, 4 being highly stressful, and 5 being extremely stressful

1. **Relationship with your children while in anesthesia school _____**
2. **Relationship with your significant other while in anesthesia school _____**
3. **Relationship with your classmates while in anesthesia school _____**
4. **Body image while in anesthesia school _____**
5. **Financial issues while in anesthesia school _____**
6. **Lack of personal time while in anesthesia school _____**
7. **Problems with eating while in anesthesia school _____**
8. **Problems with sleeping while in anesthesia school _____**
9. **Adequate time for exercise while in anesthesia school _____**

10. **New problems with blood pressure or other vital signs since beginning anesthesia school _____**
11. **Availability of resources for educational purposes _____**
12. **Adequate knowledge to handle clinical situations first year _____**
13. **Adequate knowledge to handle clinical situations second year _____**
14. **Adequate knowledge to handle clinical situations third year _____**

Please rate source of stress (specific stress factors) on a scale of 1-5, with 1 being no stress, 2 being mild stress, 3 being moderate stress, 4 being highly stressful, and 5 being extremely stressful

1. **Theoretical content of course _____**
2. **Examinations of the course _____**
3. **Assignments of the course _____**
4. **Workload of the course _____**
5. **Classroom hours of the course ____**
6. **Financial constraints of the course _____**
7. **Travel requirements of the course _____**
8. **Clinical placements _____**
9. **Death of a patient _____**
10. **Relationships with hospital staff _____**
11. **Relationships with preceptors _____**
12. **Relationships with anesthesiologists. _____**
13. **Relationship with clinical coordinators _____**
14. **Other (please specify)**
    _____

Have any of the above identified stressors caused you to consider dropping out of the anesthesia program? Yes_____ No_____

Did any of your classmates drop out of the anesthesia program because of stress related factors? Yes _____ No_____

Please rate your overall stress score on a scale of 1-5, with 1 being no stress, 2 being mild stress, 3 being moderate stress, 4 being highly stressful, and 5 being extremely stressful. _____

Thank you for your time and cooperation in completing this survey

Questionnaire adapted with permission from Laura Starcher Moon (2008)