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Nurse Anesthesia Program Directors: Applicant Selection, Attitudes, and Admission Criteria

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NURSE ANESTHESIA PROGRAM DIRECTORS:
APPLICANT SELECTION, ATTITUDES,
AND ADMISSION CRITERIA

A Major Paper Presented

by

Griffin Stewart

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NURSE ANESTHESIA PROGRAM DIRECTORS:
APPLICANT SELECTION, ATTITUDES,
AND ADMISSION CRITERIA

by

Griffin Stewart

A Major Paper Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

in

The School of Nursing

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Abstract

The field of nurse anesthesia is an evolving and demanding one, requiring challenging schooling and training. The application and selection process of nurse anesthesia students remains imperfect. The purpose of this study was to examine nurse anesthesia program directors' attitudes about the perceived importance of admission criteria and attributes in relation to success in the program. A retrospective non-experimental/descriptive survey, with mixed method qualitative and quantitative data, was used. A convenience sample of 17 program and assistant program directors completed the researcher developed survey. Data were evaluated using descriptive statistics. Nurse anesthesia program directors' attitudes about perceived importance of admission criteria and attributes in relation to success in the program showed high value placed on science GPA, emotional intelligence, personal interview, GPA, applicant essay, and critical care nursing experience. Science GPA and critical care experience showed the smallest standard deviation ranges and variance. The highest mean score was for science GPA, while the lowest mean scores were applicant age and GRE score. Free text responses highlighted attributes and admission criteria not evaluated in the survey including time/understanding of the program being applied to, time shadowing anesthesia providers, earned CCRN and critical care scenario test performance. The goal of improving the selection process should be to reduce attrition and increase first time national certification exam pass rates. Recommendations for research include expanded evaluation of nurse anesthesia students' admission requirements and their predictive value in regard to success in nurse anesthesia programs.

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NURSE ANESTHESIA PROGRAM DIRECTORS: APPLICANT SELECTION,
ATTITUDES, AND ADMISSION CRITERIA

Background/Statement of the Problem

Nurse anesthesia has a storied history, and since 1933, the nurse anesthesia profession has worked to establish the curriculum and minimum standards for schools of nurse anesthesia, led by Gertrude Fife, former AANA president (Foster & Callahan, 2011). The field of nurse anesthesia is an evolving and demanding one, requiring challenging schooling and training. The application and selection process of nurse anesthesia students still remains an imperfect science. Admittance into nurse anesthesia educational programs has stringent protocols, guidelines and selection criteria. Specifically, The Council on Accreditation of Nurse Anesthesia Educational Programs (COA) is the responsible body for establishing the standards and policies for national accreditation.

Annually, the COA publishes the standards for accreditation of nurse anesthesia educational programs. The COA requires that programs enroll only baccalaureate prepared students who meet admission criteria, which includes registration as a professional nurse in the United States and at least one year of experience as a Registered Nurse (RN) in a critical care setting (2015). The COA defines critical care experience as an area in which an RN routinely manages, interprets and implements critical decision making when using invasive hemodynamic monitors, cardiac assist devices, mechanical ventilation and vasoactive infusions (2015). The specifics of appropriate clinical experiences, in addition to the COA's requirements, are at the discretion of the program itself (Foster & Callahan, 2011). Additionally, it is up to individual programs to maintain

their own philosophy, curricula, admission requirements and other items, which are typically readily available via their program website (Foster & Callahan). Applicants must also meet the academic criteria of the institution, which may include Graduate Record Examination (GRE) scores and grade point average (GPA).

Current literature regarding nurse anesthesia programs' selection process aims to correlate admission requirements and their predictive value for success in programs. However, often non-nurse anesthesia graduates are included because sample sizes are not large enough. A knowledge gap pertaining specifically to nurse anesthesia student exists. Advanced practice nursing education does share commonalities during core Masters of Science in Nursing (MSN)/Doctorate of Nursing Practice (DNP) courses, including the three P's (advanced pathophysiology, advanced pharmacology and advanced physical assessment). However nurse anesthesia students must complete additional coursework in physiology, chemistry, biochemistry and physics, which are fundamental for anesthesia providers and indicative of the level of education required for the role (Foster & Callahan, 2011). Nurse anesthesia students are required to complete a minimum 550 anesthesia cases, accounting for 2,400 hours of actual anesthetic time, compared to the minimum of 500 clinical hours required for nurse practitioner counterparts (Foster & Callahan). With the stark difference of didactic foci, with advanced sciences and loftier clinical requirements, it may prove inappropriate to draw upon statistical analysis collected from populations that include non-anesthesia applicants to make selections for nurse anesthesia graduate admission.

Nurse anesthesia schools seek to minimize student attrition and promote academic success. Schools are judged on the basis of attrition and National Certification

Examination (NCE) for Nurse Anesthetist's first time pass rates. Both attrition and first time pass rate for the NCE are published for each program and are public knowledge, as it is required that all accredited programs submit them each year to the COA. Program directors of nurse anesthesia schools seek to select the graduate candidates with the best chance for success in their program. A questions remains: What are nurse anesthesia program directors' attitudes regarding the value of admission requirements and attributes of applicants toward success in the program? Studies evaluating nurse anesthesia program director attitudes regarding these admission criteria and their perceived ability to predict success are rare. Studies have been undertaken that examine other advanced medical professions and their program director attitudes to a larger extent than has been done specific to nurse anesthesia. The purpose of this study was to examine nurse anesthesia program directors' attitudes about the perceived importance of admission criteria and attributes in relation to success in the program.

Next, the review of the literature will be presented.

Literature Review

A literature review was performed using the CINAHL and PubMed databases. Keywords searched included nurse anesthesia, education, admission criteria, program directors and faculty attitudes, graduate nursing, nursing economics, student selection, academic achievement, and academic performance. The time period searched was from 2000-2015. In total twelve peer-reviewed articles were obtained relevant to nurse anesthesia program directors' attitudes and the perceived importance of admission criteria and attributes in relation to success in the program. Topics include attrition in nurse anesthesia programs, the selection process, the GRE, GPA, faculty perceptions, cognitive and non-cognitive criteria and emotional intelligence (EI).

Attrition in Nurse Anesthesia Programs

Waugaman & Aron (2003) evaluated attrition in nurse anesthesia students but focused on the student and socialization into the profession as a leading factor for attrition, based on prior studies. The purpose of the study was to identify socialization patterns in graduate level nurse anesthesia students. The specific aim was to identify vulnerable periods for which the risk of attrition is increased during the socialization process. A prospective cross-correlation research study was used to study the population of current enrolled nurse anesthesia students, totaling 2,008 students. Of the 2,008 students, 55% or 1,119 students responded to the modified Student Nurse Anesthetist Experience Questionnaire. Results showed the greatest statistically significant time for increased of attrition was within the initial 12-18 month period ($P = 0.001$). This time frame falls during the transition period from didactic to clinical education. This shift from the classroom to the OR requires students to quickly adapt in their new role. Functioning

as a practitioner, it becomes important for students to have the character traits and critical care nursing experience to build upon to socialize into the profession and practice of anesthesia. The array of attributes required to be successful at this period shows the impact and importance of multiple attributes and measurable qualities, which program directors must evaluate, extrapolate, and use to make the best applicant selections during the admission process. With the increased need for qualified nurse anesthetists, it is imperative that educational programs do everything to promote an environment conducive to learning and select candidates with the best chances of success in the program.

A literature review was performed by Dosch, Jarvis, and Schlosser (2008) to evaluate the current level of attrition in nurse anesthesia programs. The purpose of this study was to determine the attrition rate of each nurse anesthesia program in the United States for the cohort graduating in 2005. The study had a secondary goal to investigate program directors' beliefs about the reasons for student attrition and to explore potential relationships between attrition rates and other program factors such the size and length of the program and the program directors' longevity. A survey tool was distributed to all 101 nurse anesthesia programs, eight of which were excluded because they had no cohort for the 2005 year. Of the remaining 93 schools, 62 school directors responded, a 67% response rate. There were a total of 1,499 students. Of those, 135 or 9% did not graduate. Withdrawal occurred among 48 students (3.2%) and was the most significant reason for attrition. Withdrawal was followed by academic dismissal, which occurred in 41 students (2.7%); clinical dismissal occurred in 21 students (1.4%). The authors concluded that the attrition rate for programs was not related to the size of the program or to the length of

experience of the program director, but attrition rates were higher in programs of longer duration. Promoting retention of students starts with the selection process.

The Selection Process

The selection process for applicants for nurse anesthesia programs was examined by Creech and Aplin-Kalisz (2011). The purpose of the article was to review the existing research on graduate student selection and describe one university's newly developed selection process. The authors used a literature review to introduce the topic and segued into a descriptive review of one nurse anesthesia school's selection process. The literature review highlighted the perceived importance of the selection process and the impact it had on student individual class success, retention and graduation rates. The author described the need for more research pertaining to the graduate student applicant selection in order to assist faculty in the process (Creech & Aplin-Kalisz).

The authors reviewed a single school's evaluation tool used for graduate student applicant selection. The tool used a numeric scoring system with scaled scoring rubrics for admission criteria and student attributes. The criterion were entered into the formula producing a numerical rank, with the higher number equating to a more desirable applicant. The formula examined GPA, goal statements, and professional recommendations. The final selection of candidates was carried out by the faculty selection committee. The article highlights the complexity and objectivity in the selection process. The weighting of criteria used in the formula and the formula itself was unproven; it merely offered insight into the attitudes about admission criteria and

attributes. The decision process remains a topic for future research (Creech & Aplin-Kalisz).

The Graduate Record Examination (GRE)

The GRE is a standardized test commonly required for admission into graduate school programs. The use of GRE scores to guide admission decisions was supported by some researchers. Katz, Chow, Motzer and Woods (2009) recruited a sample of 217 students from one university, none of whom were student registered nurse anesthetists (SRNAs) over 10 years. The authors found GRE scores accounted for only 5% to 8% of the variance in graduate GPA, but recent investigation has produced mixed results. Suhayda, Hicks and Fogg (2008) performed a large scale study that examined master's level nursing students, including SRNAs. This particular study concluded that GRE scores added little predictive value in applicants that had a GPA of 3.0 or higher and an UGPA of 3.25 or higher (2008).

Kuncel, Wee, Serafin, and Hezlett (2010) published a meta-analysis with the purpose of investigating whether or not the GRE predicts academic performance of master's and doctoral students. The meta-analysis evaluated approximately 100 published studies and totaled 10,000 students. Statistical analysis showed that GRE scores were positive predictors of first year GPA, graduate GPA, and faculty rating. The analysis showed statistical significance (.03) for the use of GRE scores in the selection process, evidenced by the small variability between the averaged operational validity of GRE: between master's (.30) and doctoral (.27) programs (Kuncel et al.). An important

limitation of the study was the inclusion of non-anesthesia advanced practice nursing roles in addition to anesthesia students into the sample population.

Grade Point Average (GPA)

Burns (2011) conducted a quantitative correlational study with the purpose of examining if a statically significant relationship existed between admission criteria (GPA, science GPA, GRE and critical care experience) and academic progression (current academic status and GPA). One hundred and eight program directors were contacted and 28 (25.9%) provided student record data required for the study. Results showed that a statistically relevant relationships existed between the admission selection criteria and academic progression (Burns). There was a statistically significant relationship between admission GPA and GPA in the program ($r [914] = 0.31, P < .01$). These results suggested that as admission GPA increases, program GPA will also increase. Similarly, when SGPA was examined, a significant statistical relationship was detected with program GPA ($r [516] = 0.28, P < .001$). Data once again suggested that as the admission SGPA increases, program GPA will also increase. The highest predictive value of academic progression was evident with both GPA and SGPA (Burns). Graduate Record Exam showed a less significant result, when compared to SGPA and GPA, but there was still a positive relationship between total GRE and program GPA ($r [653] = 0.15, P < .001$). Number of years of critical care experience was found to have a surprising inverse relationship to program GPA ($r [914] = -0.14, P < .001$), suggesting that as the number of years of critical care experience increases, current GPA will decrease.

Ortega et al. (2013) conducted an evidence based literature review to evaluate applicants in nurse anesthesia educational programs and the ability to predict success in the program on the NCE for nurse anesthetists. A detailed search strategy was used and included articles from 1980 to 2011. The literature review, totaling 19 evidence based studies, could not find consensus regarding the admission factors and success in nurse anesthesia programs. The level of evidence for the majority of relevant articles was level IV non-experimental research, descriptive studies. However, the review did find multiple isolated admission criteria that showed positive statistical correlation for success. The best evidence supported undergraduate GPA (UGPA): undergraduate science or nursing GPA were significantly ($P < .001$) positively correlated with academic status, with UGPA having the strongest correlation ($R = 0.313, 0.279, 0.153$, respectively). The findings of this study indicated that undergraduate science GPA accounted for 24% of the variance ($P < .01$) in the overall NCE score. A limitation for this evidence based review was that it was forced to add combined graduate level nursing programs with nurse anesthesia students and programs with non-anesthesia graduate nursing students with anesthesia specific programs. The review supported the use of GPA and science/nursing GPA as a predictor of success and indicated a need for further research for GRE because of the inconsistent results (Ortega et al.).

Faculty Perceptions

Clayton, Lypek and Connelly (2000) published an exploratory study with the purpose of describing and investigating military clinical faculties' perception of characteristics that nurse anesthesia students need for success in the clinical portion of their graduate education. The participants consisted of 29 clinical faculty, a mix of Army,

Air Force and Navy and had a 100% response rate. A mixed quantitative/qualitative survey was used. The first portion was strictly quantitative consisting of 35 characteristics divided into four categories: academic knowledge; nursing knowledge; clinical skills; and personal characteristics. Characteristics were ranked based on level of importance for success: 3 or essential, required for clinical success; 2 or important, contributes to clinical success; 1 or low importance, minimal effect on clinical success; 0 or unimportant, does not contribute to clinical success. The second portion of the survey consisted of yes/no questions and qualitative questions to ensure completeness of the findings. Results showed that 28 of the 35 characteristics were ranked as essential or important by the faculty. Integrity, ability to learn from mistakes, judgment, clinical awareness, hardiness, and commitment were rated essential.

The transition from didactic to clinical education places a large role in program success in clinical on personal characteristics and clinical awareness. Interestingly, the personal characteristics were considered essential to success, but noted that there is no reliable way of evaluating or measure these nonacademic variables. This study's implications may be limited because of its publication date, 2000. The population was limited to military nurse anesthesia providers. It is possible that military personal may place value in different characteristics based upon their training and the culture of their branch of the military (Clayton et al.).

Cognitive and Non-Cognitive Factors

Over time, the literature on this topic expanded in focus to include cognitive and non-cognitive factors, which previous articles had implied as a factor requiring future

research. In 2011, Wong and Li examined, in a pilot study, 63 intrapersonal and 15 interpersonal personality characteristics that Certified Registered Nurse Anesthetist (CRNA) clinical faculty believed to influence practice, both safe and unsafe, for student nurse anesthetist. The pilot group, group A, consisted of 10 expert CRNA clinical faculty members participants and had a return rate of 100%. The authors requested that group A determine whether the individually listed personality characteristic designated safe or unsafe nurse anesthesia practice. Group A members were also asked to distinguish if the individual personality characteristics were appropriate or not for the purpose of the study. After the completion of the pilot study, Group B, which consisted of nursing anesthesia educational program faculty (NAEPs), was established by random selection of 14 out of 82 possible NAEPs (17%). Group B was much larger, with 47 participants, and had 25 completed surveys returned, a return rate of 53%. The combined return rate for group A and group B was 61% and totaled 35 participants.

The authors found that of the 49 of the intrapersonal characteristics, 17 intrapersonal characteristics were determined to indicate safe nurse anesthesia practice and 20 were determined to indicate unsafe nurse anesthesia practice. The most statistically significant safe intrapersonal characteristics, with 95-100% agreement, included being vigilant, observant, shows good judgment and able to work well under stress. The most significant unsafe intrapersonal characteristics, with 100% agreement, included poor critical thinking skills, does not recognize limitations, shows poor judgement, unable to learn from mistakes, unable to work while stressed and unable to comprehend instructions. This study could offer additional cognitive and non-cognitive characteristics admission factors that would improve the success of student nurse

anesthetists. Interestingly, there was a greater abundance of characteristics that faculty deemed to be unsafe with 100% agreement. Evaluation of characteristics would, however, prove difficult to discern and might differ from evaluator to evaluator. The authors described the obtainable improvement of the admission process and clinical evaluations/remediation with the evaluation and application of identified cognitive and non-cognitive factors (Wong & Li).

Emotional Intelligence (EI)

The topic of EI in the competitive admission process is becoming increasingly more routine. Humphrey-Murto, Leddy, Wood, Puddester, and Moineau (2014) sought to examine whether EI abilities test scores at admissions predicted future academic performance in medical school, with the goal of evaluating the efficacy of using EI to make admission decisions. The methods began at the initial medical school applicant interview, at the University of Ottawa in 2006 and 2007, where all interviewees were invited to respectively complete the Mayer–Salovey–Caruso EI Test and then again at matriculation. The Mayer–Salovey–Caruso EI Test scores were correlated with the participants’ written exam and objective structured clinical examinations (OSCEs) administered during the four-year program. Data analysis using descriptive statistics and Pearson correlations was performed and found no significant correlations between Mayer–Salovey–Caruso EI Test scores and written examination scores or number of failures. Results obtained are interesting given the multitude of studies describing the need for further research to evaluate the topic, along with the growing interest and perceived value placed on EI. A limitation of the study was that students were not nurse anesthesia students.

Similarly, Collins (2014) explored the relationship between EI scores, preadmission demographics, clinical scores and NCE scores. The major difference is the population in the Collins study was student registered nurse anesthetists. “Emotional intelligence is the ability to recognize emotions in self and others and the capacity to use those emotions to enhance emotional and intellectual growth and decision-making” (p. 466). The cross-sectional correlational study evaluated student nurse anesthetist at matriculation, at one year of study, in the last semester of study, and the relationship of these to clinical scores and NCE scores. Emotional intelligence was measured using the online Mayer- Salovey Caruso Emotional Intelligence Test instrument and provided 15 individual EI scores for each subject. In the study of 216 SRNA participants, 69 (31.9%) were male students and 147 (68.1%) were female. Several of the EI variables were predictive of success on the NCE ($n = 65$). The regression containing all EI variables had predictive items, including Facilitation Task ($P < .002$), Sensations Task ($P < .005$), EI Facilitation Branch ($P < .009$), and EI Reasoning Area ($P < .050$), but the model was not significant ($P = .161$). Collins highlighted the difficulty of relating emotional intelligence scoring tools and the variables in the study over the entire length of the study.

In summary, the literature covered a multitude of foci, ultimately showing the high cost of education and the need for improved selection process for programs with evidence of attrition. Studies also showed a variable positive relationship of personal characteristics and academia criteria toward academic success but inferred the need for additional research. This author also found a limitation in the number of current articles that focused on nurse anesthesia programs specifically. Limited data from program directors and faculty attitudes regarding student registered nurse anesthetist criteria for

selection is consistent with the force driving the need for this study. It is evident that student success in nurse anesthesia educational programs is a true concern for faculty members. The purpose of this study was to examine nurse anesthesia program director attitudes about the perceived importance of admission criteria and attributes in relation to success in the program.

Next, Patricia Benner's Novice to Expert model will be presented and its application as the foundation for this research study's theoretical framework will be identified.

Theoretical Framework

The Merriam-Webster Online Dictionary (n.d.) defines an expert as one who has or shows a special skill or knowledge because of what they have been taught or what they have experienced. Patricia Benner (1982) saw that nursing was becoming increasingly more complex, putting more responsibilities on the nurse and creating a need for career development along the entire profession's spectra. The advancement and development of the nursing role is no more evident than as illustrated by Advanced Practice Registered Nurses (APRNs). The CRNA role in particular has grown from simple ether drop techniques to the complex, outcome focused, evidence based practice required for the modern day surgery and patient management. Burger et al. (2010) added that research shows that skill development and cognitive processing develops with experience over time and varies with competency level. The selection process of nurse anesthesia graduate applicants is driven by the ability of the applicant to critically think.

What are the differences between an expert nurse and the novice nurse? To examine this, Benner applied the Dreyfus model of skill acquisition to nursing (Burger et al., 2010). Benner's systematic study described five levels of proficiency (novice to expert) that nurses go through to achieve expertise in clinical decision making and skilled nursing interventions (Burger et al.). The theoretical framework established by Benner takes into account experiences and education as the nurse transitions, in order, from novice, advanced beginner, competent, proficient to expert.

In the novice stage, the nurse has no experience with the situations in which they are expected to perform tasks (Benner, 1982). Specifically the nurse primarily focusing on rules, performing described task as objective parameters, but lacks discretionary

judgment to guide relevancy and decision making (Benner). Tasks can be explained as the individual performance of rules that have objective parameters, for example obtaining and documenting total urine output for the hour. Novice nurses are task-oriented and focus on the completion of tasks, but lack the scope of importance regarding the objective parameters obtained.

For Benner, the advanced beginner nurse is characterized as a nurse that can demonstrate marginally acceptable performance (Benner, 1982). The advanced beginner makes the leap from novice because of the experience of real situations in which there are meaningful learned aspects. The Dreyfus model defines aspects as overall or global characteristics that require prior experience in real situations for recognition (Benner). Similar to the novice nurse, the advanced beginner nurse focuses on rules and can take little in regarding the situation at hand. Much of the time during the advanced beginner stage, for the learner and their mentors, is spent on aspect recognition, implications and determining clinical importance (Benner).

A competent nurse has typically been on the job for two to three years and establishes actions in terms long-term goals or plans (Benner, 1982). The plans take into account conscious, abstract and analytic evaluation of current problems. At this stage, the competent nurse may have feelings of mastery and may have the ability to cope with change, but ultimately lacks the speed and flexibility in practice of the proficient nurse (Benner).

The Dreyfus model describes the qualitative leap from the competent to proficient level of performance. Proficient nurses are no longer using rules and formulas but rather

past concrete experiences to guide practice (Benner, 1982). The level of proficiency is reached with continued practice, as the nurse looks at maxims and evaluates situations as a whole rather than the individual aspect (Benner). Experienced based knowledge guides the nurse's practice regarding what to expect in normal situations and is able to decipher if the situation is atypical (Benner). Similarly to the competent nurse, this is performed through aspect evaluation, but conversely the proficient nurse is more able to prioritize importance.

The expert level is the final, most advanced, stage of the Dreyfus model. The expert nurse has an enormous background of experience providing an intuitive grasp of the situation, ability to zero in the region of the problem and eliminate the large range of unfruitful possible problem situations (Benner, 1982). It is commonly difficult to grasp verbal descriptions of expert practice because experts operate holistically with a deep understanding of the situation, rather than procedural or incremental steps (Benner). Benner (1984) stated "It is important to note that as nurses move from a known area of practice, where they have gained expertise, to a new one, they become novices again (as cited in Cangelosi, Crocker & Crocker, 2009, p. 368).

Patricia Benner's Novice to Expert theory establishes a framework for nursing experience as a nurse transitions, in order, from novice, advanced beginner, competent, proficient to expert. The Novice to Expert framework offers a pivotal evaluation of expertise in clinical decision making and skilled nursing interventions, taking into account experiences and education. This framework shows the evolution of the RN and would provide insight into the graduate nurse anesthesia applicant, as clinical decision making and nursing interventions take into account experiences and education. The

quantification of these factors are evident in the use of GPA, GRE and years of critical care experience as admission criteria that are weighed in the selection process. Using Patricia Benner's Novice to Expert theory places importance on flexibility and the ability to grasp the whole situation. Additionally, Benner's theory states that when role transition occurs, similar to a RN entering the SRNA role, the individual becomes a novice again and must progress up the ladder of experience. Nurse anesthesia education is complex, combining advanced academic theory and research-based clinical practice (Foster & Callahan, 2011). The selection of graduate nurse anesthesia applicants is a fluid process. Applicants must have the proper past experiences and the ability to build on past experiences to excel and move forward.

Next, the study methods will be presented.

Method

Purpose

The purpose of this study was to examine nurse anesthesia program directors' attitudes about the perceived importance of admission criteria and attributes in relation to success in the program

Design

A retrospective non-experimental/descriptive survey, with mixed method qualitative and quantitative data, was used.

Sample and Site

A convenience sample comprised of nurse anesthesia program directors within the New England Assembly of School Faculty (NEASF) during the summer 2016 NEASF meeting was used. The New England Assembly of School Faculty summer meeting was held on June 9th, 2016 at the Hot Tomatoes restaurant, in Hartford, CT. The New England Assembly of School Faculty is comprised of 13 schools, each with a designated program director. Inclusion criteria identified program directors and assistant program directors in attendance of the NEASF summer 2016 meeting. Exclusion criteria included any attendees that are not either program directors or assistant program directors and those program directors not in attendance and program directors from outside of the NEASF.

Procedures

Rhode Island College IRB reviewed the protocol and determined it to be exempt. The NEASF Chairman was contacted via email in order to request that time be allocated

for research survey completion during the summer 2016 NEASF meeting. Contact with the NEASF Chairman was feasible with the help of Anne E. Tierney, CRNA, MSN, MA, CRNA Program Administrator at the St. Joseph Hospital School of Nurse Anesthesia and NEASF member.

With the support of the NEASF chairman, and at the aforementioned meeting, program directors were provided with an IRB approved informational letter for the proposed survey research. The letter described the purpose, procedures, risks and benefits and reiterated that participation in the study was designed strictly voluntary and anonymous. The informational letter and survey were contained within individual manila folders. Individual manila folders were handed directly to each potential participant by the researcher and collected by the researcher upon completion. Potential participants were instructed to read the letter and if they agreed to complete the survey. Upon completion participants were instructed to place survey back into the manila folder provided and return to researcher.

Measurement

Participants were asked to rate current admission criteria and attributes of graduate nurse anesthesia applicants on a paper survey developed by this researcher entitled “Nurse Anesthesia Program Directors: Applicant Selection, Attitudes, and Admission Criteria Survey”. No survey was identified in the literature that met the purposes of this research, thus key variables were identified from the literature. These included GPA, SGPA, GRE scores, years of critical care experience, and acuity, personal interview, reference letters, applicant essay, applicant age and emotional intelligence.

Items were evaluated using a seven point interval scaled from not important (1) to most important (7) (Appendix A). Additionally, the survey provided a qualitative section for program directors to add any additional comments regarding the survey. The survey was piloted by requesting that the program director and assistant program director from the St. Joseph Hospital School of Nurse Anesthesia review for clarity and readability. Feedback was positive and no additional revisions were required.

Data Analysis

Data analysis took place at Rhode Island College library and was completed by the researcher. Data analysis was conducted in Excel using descriptive statistics, including means, ranges, and variances. Data was stored in a locked file cabinet at researcher's residence prior to data analysis and upon summation of data.

Next, results will be presented.

Results

A total of 21 program and assistant program directors attended the meeting and met the identified criteria. Of the 21, 17 completed the survey, a response rate of 81%.

Table 1 illustrates the Likert scale survey responses for each participant. The survey responses ranged from 1 to 7, with 1 = not important and 7 = most important.

Table 1

Mean scores on 'Nurse Anesthesia Program Directors: Applicant Selection, Attitudes, and Admission Criteria Survey'

Participant #	GPA	SGPA	GRE	YCCE	CCEA	PI	RL	AE	AA	EI
1	6	7	N/A	6	6	7	5	1	4	5
2	7	7	5	6	6	7	5	5	1	7
3	7	6	5	7	6	7	5	6	5	6
4	6	6	4	6	6	7	5	6	4	7
5	6	6	3	7	7	6	3	N/A	2	7
6	6	7	4	6	7	6	6	5	1	6
7	7	7	3	5	6	5	5	3	3	6
8	6	7	1	5	6	7	6	4	5	6
9	7	7	5	7	7	7	6	6	4	6
10	5	6	2	6	6	6	2	3	1	7
11	6	7	N/A	5	6	6	4	5	1	7
12	6	6	1	5	6	5	1	5	4	7
13	6	7	5	7	7	7	6	4	1	6
14	6	6	1	7	7	6	2	3	3	7
15	6	6	6	6	7	7	5	4	N/A	6
16	6	7	5	6	6	7	7	5	4	7
17	7	7	7	6	7	7	5	5	4	7
Mean	6.235294	6.588235	3.8	6.058824	6.411765	6.470588	4.588235	6.0625	2.9375	6.470588
Standard Deviation	0.562296	0.5073	1.897367	0.747545	0.5073	0.71743	1.660528	1.360147	1.526161	0.624264
Range	2	1	6	2	1	2	6	5	4	2
Variance	0.297578	0.242215	3.36	0.525952	0.242215	0.484429	2.595156	1.734375	2.183594	0.366782

Key: GPA= Grade point average; SGPA= Science GPA; GRE= Graduate Record Examinations; YCCE= Years of critical care experience; CCEA= Critical care experience acuity; PI= Personal Interview; RL= Reference Letters; AE= Applicant Essay; AA= Applicant Age and EI=Emotional Intelligence.

Mean scores showed high level of importance placed on SGPA, emotional intelligence, personal interview, critical care experience acuity, GPA, applicant essay,

and years of critical care experience, with mean scores all above 6 on the 1 through 7 Likert scale (6.58, 6.47, 6.47, 6.41, 6.23, 6.06 and 6.05 respectively). The value of 6 or greater correlates with very important attributes and admission criteria. The SGPA and critical care experience had the smallest standard deviation (0.51, 0.51), ranges (1, 1) and variances (0.24, 0.24). The lowest mean scores were those for applicant age and GRE, with means of 2.9 and 3.8 respectively. The GRE had the largest standard deviation (1.89), range (6) and variance (3.36).

The survey asked participants to share any additional comments. Table 2 illustrates free text responses.

Table 2

Free text responses

Participant #	Free Text Response
2	<ul style="list-style-type: none"> • Time/understanding of the program they are applying to • Time shadowing anesthesia providers
5	<ul style="list-style-type: none"> • GRE: tending to focus on writing score and find articulate candidates • Age: Need maturity, do not like new graduates with only 1 year of experience • Emotional intelligence: Very important but difficult to assess • Personal interview: important but not always indicative of results
10	<ul style="list-style-type: none"> • CCRN • Critical care scenario test performance
16	<ul style="list-style-type: none"> • Interview is most critical

In total, four participants took advantage and used the provided space for additional comments. Responses by two participants supported the importance of the personal interview, but also added that it is not always indicative of results. The importance of the personal interview was also supported in the survey with a mean score

of 6.47. The difficulty of assessing emotional intelligence was added by one participant and shows the need for further research. One participant grouped age, maturity and critical care experiences, and how they do not typically accept novice nurses with only one year of critical care. Free text responses highlighted attributes and admission criteria not evaluated in the survey including time/understanding of the program they are applying to, time shadowing anesthesia providers, CCRN, and critical care scenario test performance.

Next, summation of findings will be presented and discussed.

Summary and Conclusions

Nurse anesthesia schools and their program directors seek to minimize student attrition and promote academic success. Attrition rates and National Certification Examination (NCE) for nurse anesthetist's first time pass rates are the benchmarks that each accredited program must monitor and submit to the COA for every graduating class and must meet national standards. These benchmarks are published accessible to the public. Benchmarks must meet national standards set forth by the COA. It proves prudent that program directors of nurse anesthesia schools select the graduate candidates with the best chance for success in their program not just for the student success but also to maintain the national accreditation for their nurse anesthesia program.

Current literature has shown that attrition is a reality in nurse anesthesia programs. Dosch et al. (2008) studied attrition and found a 9% attrition rate. Creech & Aplin-Kalisz (2011) described the selection process and its' impact on student classroom success, retention and graduation rates. The authors described the need for more research pertaining to the graduate student applicant selection in order to assist faculty in the process. A knowledge gap was found during the examination of literature in that few have sought to correlate admission requirements and their predictive value for success in programs that examined nurse anesthesia students exclusively.

The purpose of this study was to examine nurse anesthesia program directors' attitudes about the perceived importance of admission criteria and attributes in relation to success in the program. Seventeen program and assistant program directors who attended the New England Assembly of School Faculty (NEASF) during the summer 2016 NEASF meeting completed a researcher-developed survey. The Nurse Anesthesia

Program Directors: Applicant Selection, Attitudes, and Admission Criteria Survey used a Likert Scale, with numerical value from 1 (Not at all important) to 7 (Extremely important) to represent personal perceived level importance of selected variables to the applicants' success in nurse anesthesia programs. Science GPA revealed the highest mean response (6.59) and a small range of responses (1) with a standard deviation of 0.51 and variance of 0.24. The highest mean score belonging to SGPA is supported by Ortega, Burns, Hussey, Schmidt and Austin (2013) as discussed above. Emotional intelligence and the personal interview received the second highest mean response (6.47). Grade point average, critical care experience and acuity along with application essay all had mean scores greater than 6, showing a high level of importance

In contrast, applicant age had the lowest level of importance, with a mean score of 2.94, a large range (4), a high standard deviation (1.53) and variance (2.18). The second lowest mean was found for the GRE. The GRE responses had a mean of 3.8, but had a wide range of scores (6) with a statistically significant standard deviation of 1.90 and variance of 3.36. The third lowest mean was found for the reference letter with a mean of 4.59; there was a large range (6) and high standard deviation (1.66) and variance of 2.59.

Table 2 provided the free text responses for additional comments regarding the survey. In total four participants took advantage and used the provided space for additional comments. Two separate participants supported the importance of the interview, with one of the two adding interview success is not always indicative of the students success in the program. The participant also discussed the GRE stating they tended to place a higher importance on the writing portion versus the mathematical portion of the exam. The same participant added separate comments regarding the

difficulty of assessing EI. Free text responses also provided variables not examined in this study including shadow time, CCRN certification, critical care simulations, and understanding of the program.

Limitations included the fact that this researcher developed this measure for this research due to a lack of measurement instruments found in the literature. The survey was piloted with two program directors and feedback was positive. Though the survey was not psychometrically tested, study participants appeared to be able to successfully complete it. The small difference in mean scores of the variables that were scored the highest in the survey made interpretation difficult. The small sample size and convenience sampling were additional limitation of the study. In particular, free text responses were limited, yet they were illuminating. In conclusion, the results from this study identified many admission criteria and attributes of applicants that program directors placed high importance on. High value was placed on SGPA, emotional intelligence, personal interview, critical care experience acuity, GPA, applicant essay, and years of critical care experience. The GRE and applicant age held the lowest value in the selection process as a whole but had wide variation and range in scoring. Based on this research, it is difficult to delineate a single most important factor identified by the respondents. This is consistent with the literature and highlights the difficulty of the selection process. Directors must evaluate the whole candidate and make the best supported choice. It is evident that program directors of nurse anesthesia schools seek to select the graduate candidates with the best chance for success in their program.

Next, recommendations and implications for practice will be discussed.

Recommendations and Implications for Advanced Nursing Practice

Nurse anesthesia as a profession has a rich history and in recent years CRNAs have fought to practice to the full scope of their education. Nurse anesthesia programs must be able to produce competent practitioners and prepare them to delivery safe and cost effective anesthesia care. Program directors are at the forefront of nurse anesthesia advancement. Admittance into nurse anesthesia educational programs is typically based on stringent protocols, guidelines and selection criteria. Current literature regarding nurse anesthesia programs' selection process aims to correlate admission requirements and their predictive value for success in programs. A knowledge gap pertaining specifically to predictors of success of nurse anesthesia student exists.

Current recommendations for research include an expanded evaluation of nurse anesthesia program admission requirements and their predictive value to student success in the programs. There is a need for further studies regarding nurse anesthesia programs' selection process, admission requirements and their predictive value for success in programs with nurse anesthesia student. Building on this study, additional free text attributes and admission criteria not evaluated in this study but included in the free text responses could be evaluated. These include time/understanding of the program they are applying to, time shadowing anesthesia providers, CCRN and critical care scenario test performance. As well, expanded research and understanding regarding emotional intelligence and the nurse anesthesia student could be pivotal to the improvement of the selection process, allowing directors to evaluate the applicant better.

Moving forward from this study and beyond the selection process and its success, which has been simply measured by graduation and first time NCE pass rate, further research on the relationship between the students' level of success in program and their success as licensed practitioner, post-graduation, should be undertaken. This would bring full circle the applicant, selection process, the student and practitioner.

The advancement in the requirements for nurse anesthesia education moving from a master's degree to a doctorate degree should trigger further research aimed exclusively at admission criteria for doctorate nursing anesthesia applicants is needed. This policy development mandated for the future of nurse anesthesia practice is a major transition. Though the practice and policy of nurse anesthesia may not change, professional respect and equity may increase. The transition to the doctorate prepared nurse anesthetist not only increases the duration of the program but may change the selection process and reinforce the importance of applicant admission criteria and attributes. A longer duration of study and expanded curriculum requirements, including application of evidence-based best practices, creates a different dynamic and emphasis as compared to the masters programs. Current research regarding the selection process could be replicated looking specifically at nurse anesthesia doctorate programs. We must use evidence based practices in the selection process and continue to produce highly competent practitioners.

The importance of the best selection process goes beyond attrition and first time NCE pass rates. The delivery of safe anesthesia care is the standard for every patient that is cared for by a CRNA. The CRNA must be able to provide the most appropriate anesthesia care that each patient requires. The implications for practice are not complex. The practice of nurse anesthesia should aim to be safe and cost efficient. Training the best

nurse anesthetists should be the goal of every nurse anesthesia educational program. Program directors take an active role in the application, selection and education of the next generation of CRNAs. Undoubtable nurse anesthesia program directors must make difficult decisions when selecting which applicants should be offered admissions into programs. Directors must follow stringent protocols, guidelines, judge a large pool of applicants and only then offer admission to those qualified applicants with best chance for success. It is true that the application and selection process of nurse anesthesia students is an imperfect science, as evident by the current attrition rates. Nurse anesthesia program directors' attitudes about perceived importance of admission criteria and attributes in relation to success in the program is an important aspect of the selection process. The continued evaluation and evolution of this process will ensure the production of qualified nurse anesthetists in the future.

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Appendix A

NURSE ANESTHESIA PROGRAM DIRECTORS: APPLICANT SELECTION, ATTITUDES, AND ADMISSION CRITERIA SURVEY

Participant number; #

The purpose of this study is to examine nurse anesthesia program director attitudes about the perceived importance of admission criteria and attributes of applicants in relation to success in the program.

Survey items represent admission criteria that may be evaluated during the application/admission process.

Please assign a numerical value from 1 (Not at all important) to 7 (Extremely important) to represent your personal perceived level importance of applicants for success in nurse anesthesia programs.

Survey Item	Level of Importance							
	Not at all important	Low importance	Slightly important	Neutral	Moderately important	Very important	Extremely important	Not applicable
GPA	1	2	3	4	5	6	7	N/A
Science GPA	1	2	3	4	5	6	7	N/A
GRE	1	2	3	4	5	6	7	N/A
Years of critical care experience	1	2	3	4	5	6	7	N/A
Critical care experience acuity	1	2	3	4	5	6	7	N/A
Personal Interview	1	2	3	4	5	6	7	N/A
Reference Letters	1	2	3	4	5	6	7	N/A
Applicant Essay	1	2	3	4	5	6	7	N/A
Applicant Age	1	2	3	4	5	6	7	N/A
Emotional Intelligence	1	2	3	4	5	6	7	N/A

Please feel free to share any additional comments below.

