ORIGINAL RESEARCH

Nurse anesthesia student's personality characteristics and academic performance: A big five personality model perspective

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ABSTRACT

Purpose: The purpose of this correlational research was to assess the association between the Five Factor Model (FFM) of personality traits and the grade point average (GPA) of students enrolled in a nurse anesthesia program (NAP). This research was conducted to identify a more objective way to evaluate a prospective students' personality that correlates with academic success in a NAP.

Methods: The Program Directors of students enrolled in NAPs throughout the United States were randomly contacted to assist with the data collection. The FFM of personality traits inventory and question requesting the student to self-report their GPA were then forwarded to the student.

Results: Upon completion, the data was analyzed using SPSS 22.0. The results demonstrated a significant correlation, indicating that the dimensions of personality were significantly related to GPA. The dimensions of personality accounted for 12% of the variance in GPA. An examination of individual regression coefficients revealed that the personality trait, conscientiousness, was significantly and positively related to GPA.

Conclusions: Nurse anesthesia admission committees can use this personality inventory to better guide them in selecting candidates for their program. Used in conjunction with the more traditional admissions criteria; NAPs can be better positioned to select students more objectively that will be successful in their program, hence leading to lower attrition rates.

Key Words: Five factor model of personality, Conscientiousness, Nurse anesthesia program, Grade point average

1. INTRODUCTION

The charge of the nurse anesthesia program (NAP) admissions committee is to admit qualified applicants who will successfully complete the program.[1] Faculty within NAPs make every effort to minimize attrition and admit students who will be successful.[1] The accrediting body for NAPs sets the minimum admission requirements into a NAP as: a baccalaureate degree, preferably a Bachelor of Science in Nursing and a licensed registered nurse (RN) with at least one year working in an acute care setting.[2] However, most programs go above and beyond the minimum admission requirements, to include: a science grade point average (SGPA) > 3.0, a total grade point average (GPA) > 3.0, the Graduate Record Examination (GRE), prerequisite coursework that may include biochemistry and organic chemistry, and individual interviews.[3] These traditional variables used among

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NAPs are an attempt to admit students that will be successful. However, despite the stringent nature of these traditional selection criteria, non-cognitive variables, which may not be apparent upon enrollment, limit program success for some students and may be useful to consider when assessing a nurse anesthesia candidate.[4]

Nurse anesthetists manage more than half of the anesthetics given to patients each year in the United States. Furthermore, they are the sole anesthesia providers in the majority of rural hospitals in the United States.[5,6] Nurse anesthetists are required to possess excellent critical thinking skills and precise technical skills necessary to administer anesthesia and anesthesia-related services to patients in a wide array of health care settings.[5,6]

A significant objective of a NAP is to select capable applicants who have the potential to complete the program successfully and to carry on the legacy of the practice.[7] The accreditation program for NAPs began in 1952 by the American Association of Nurse Anesthetist (ANNA). The Council on Accreditation (COA) took over the task of accreditation in 1975 and is the present credentialing body for nurse anesthesia programs.[8] The COA gives recognition to the communities that represent interest within the nurse anesthesia profession.[8]

Historically, personality traits, oral communication skills, maturity, integrity, compassion, and leadership were noted as essential traits for academic success and professional practice.[5] The current literature indicates that personality variables are a significant component in academic performance.[6,7] Only some of the many causes of attrition are related to intellectual ability.[8] To accurately assess a candidate's potential to be successful in a graduate program, the literature supports the need to assess additional variables, such as personality.[8] Moreover, personality traits can be as significant as the traditional cognitive traits when predicting success.[8]

The purpose of the interview process is to assess the candidates' personality, however, identifying personalities that will be successful cannot effectively be determined by faculty interviewers.[1] Kreiter Yin, Solow, and Brennan[9] established that the interview lacks the accuracy desired to validate its significance in the admissions decision process. Additionally, the use of interviews as a consistent or effective variable in the health care professions admission process is not supported in the literature.[10,11] Individuals assessing admission criteria essentially just do not have the reliability or the validity when attempting to predict academic performance.[1] Therefore, the selection of candidates with the best traits or characteristics cannot be accurately undertaken solely by an interview with the admissions committee.[10]

In extremely selective programs, such as a NAP, where the cognitive aptitude is more homogeneous, and students are preselected based on intellect; personality traits can be a better predictor of academic success.[12] The literature has demonstrated a correlation between personality and academic success, which supports the consideration of personality traits to better direct students' academic performance.[13–16] Unfortunately, the primary method of assessing the personality of candidates is through face-to-face interviews, which is a poor practice at best.[1] Therefore, the purpose of this correlational research was to assess the association between the Five Factor Model (FFM) of personality traits and the GPA of students enrolled in a NAP. This research was conducted with the hope of identifying a more objective way to evaluate a prospective students' personality that correlates with academic success in a NAP.

The personality dynamics that are assessed in the FFM include conscientiousness, extroversion, neuroticism, agreeableness, and openness to experience.[17] Neuroticism is the amount of negative feeling/emotion that an individual may feel; extroversion is the degree to which a person is candid and appreciates intermingling with the peripheral world; agreeableness is the measure of accord within a community and collaboration that an individual pursues; conscientiousness comprises achievement and dependability and openness to experience is the degree to which an individual is tolerant, nonconformist, and creative.[17–19] Each of the five factors has six sub-features, totaling 30 personality features.[16] This study was able to discern a correlation between the Five Factor Model of personality and GPA.

Significant correlations between personality and students' academic success have been reported in the literature.[20,21] Personality traits may be able to explain up to 25% of the variance relative to academic success.[1] A student's personality is now seen as a predictor of academic success, even more so than intelligence alone. Furthermore, personality traits are becoming more significant at the graduate level at predicting success. A review of the literature on what personality traits correlated with learning and academic success was conducted by Jensen.[22] Two conclusions were established from this review of the literature: Ability to learn new material and general intellect is positively correlated with openness to experience, while conscientiousness is positively correlated with educational success. Tok and Morali[23] found similar results when they studied the predictive capability of the FFM of personality characteristics of faculty applicants' academic achievement. In that study, 295 faculty applicants' completed

the FFM of personality. Tok and Morali[23] established that GPA correlated positively with conscientiousness and openness to experience, however GPA correlated negatively with neuroticism. Furthermore, the FFM of personality predicted significant variance in GPA.[23] Fagan and Squitiera 26 set out to determine if a correlation could be made to specific personality characteristics and academic achievement in law school. They found similar findings, in that personality characteristics were significantly correlated with GPA in their law students.[24]

Personality traits add a significant predictive effect with understanding students' specific differences related to academic success. While intelligence tests can assess where the student is at that moment in time, personality test may be able to predict how successful that student will be.[25] Aguilar[26] researched if the FFM of personality inventory could predict GPA more accurately than a cognitive based inventory. The study confirmed with what other studies have established: GPA is positively correlated with the personality trait of conscientiousness.[26] The study showed that a cognitive based inventory did not predict GPA over academic terms. Ferguson, Sanders, O'Hehir, and James,[27] evaluated personality, personal statements, and prior academic performance as they correlated with future academic success in medical school. Regardless of the information or the amount of information in an applicant's personal statement, Ferguson et al.[27] found it not to be predictive of future academic success performance. Conversely, both prior academic performance and conscientiousness were correlated to academic success in medical school. Conscientiousness demonstrated greater validity over prior academic performance academic performance.[27]

The purpose of choosing the FFM model of personality to assess student's personality traits comes from an exhaustive review of the literature. The Five Factor Model of personality is based on the language that people use to communicate and understand each other.[28] When studying personality traits, the FFM model is the most prevalent among psychologists.[17] The FFM is widely accepted among researchers and recognized as an explanation of the structure of personality.[19,29] The model has been well received amongst researchers because it not only determines the number of significant factors in an individual's personality, but also aligns with what other researchers had established to describe a person's individual differences.[29] The FFM addressed the concerns of behavioral psychologists by uniting a multitude of theories that were fundamental to the body of knowledge. The FFM afforded the ability of personality researchers to get answers to many common questions, while establishing the consistency of self-reports.[29]

2. METHOD

2.1 Design, sample and ethical considerations

The purpose of this correlational research was to assess the association between the FFM of personality traits and the GPA of students enrolled in a NAP. This determined the following research question: What is the relationship between select dimensions of personality and grade point average in nurse anesthesia students? The sample for this study was composed of a convenience sample of students enrolled in NAPs throughout the United States. The research inclusion criterion were all classes of students who were enrolled in a NAP. The exclusion criterion was the student's refusal to participate in the study. A letter containing the informed consent and a description of the research was provided to participants following IRB approval. No distinctive identifiers were assigned to guarantee the anonymity of each participant.

A G*Power analysis was conducted to establish the minimum sample size that would achieve a statistically valid result. The power analysis assumed a medium effect size (.15), an alpha value of .05, and a power of .80 with five predictors. The results of the power analysis showed that a minimum sample size of 92 participants were required for this study. A total of 95 students responded to the study survey.

2.2 Instrumentation

The NEO FFI-3 is a 60-item instrument that represents the personality inventory for the current study. Conscientiousness, extraversion, neuroticism, agreeableness, and openness to experience are the five basic traits of personality that has been classified by researchers. According to McCrae,[29] the FFM is the underpinning of a person's behavior; it is a psychological personality inventory that embodies a wide array of adult populations. It is the most extensively researched personality framework for predicting academic performance.[30] It is particularly beneficial in understanding a person's basic emotional, interpersonal, experiential, attitudinal, and motivational styles. With the inventory taking approximately 15 minutes, the NEO FFI-3 affords a fast, dependable, and precise measure of the FFM of personality traits. Moreover, the calculation of the raw score could be done in less than two minutes.[31]

In addition to the 60 items of the NEO-FFI-3, the online survey also requested participants to self-report their GPA. Participants' responses to the question functioned as the dependent variable in this research. Haritos, Shumway, Austin, and Ellis[32] conducted the earliest research examining the qualifications of students accepted into NAPs and the requirements and factors that influence the selection process.

Haritos et al.[32] determined that an overall GPA of 3.3 was an acceptable admissions variable. Overall, Haritos et al.[32] found that GPA was a significant variable used by admission committees for consideration of candidates' acceptance into a NAP.

The NEO FFI-3 entails five 12-item scales that measure each domain.[31] Eight-factor analysis that examined samples of varying age groups, various cultures and language were used to identify items for inclusion.[31] Several short-term test-retest reliability studies were able to demonstrate correlations ranging from 0.85 to 0.90. The internal consistency has median score of .82 with a range from .72-.88.[31]

The facet scores in the neuroticism domain include anxiety, angry hostility, depression, self-consciousness, impulsiveness, and vulnerability. The openness to experience domain consists of fantasy, aesthetics, feelings, actions, values, and ideas. The extroversion domain includes friendliness, sociability, decisiveness, pleasure seeking, and positive emotions. The six facet scores for agreeableness are trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness. The facets for the conscientiousness domain are competence, order, dutifulness, achievement striving, self-discipline, and deliberation.[31] An inter-item reliability analysis using Cronbach's alpha to assess the reliability of the NEO FFI-3 subscales was conducted. The reliability coefficients for each subscale are presented in Table 2. All reliability coefficients were at least .7, indicating that all of the subscales had acceptable reliability.

The FFM of personality inventory is suitable for assessing personality in adults. Numerous research studies demonstrated the tool's reliability and validity.[33,34] Internal consistency for the five domains consistently range from 0.75-0.97 for domains and 0.91-0.96 for facets.[31,35] Validity data has shown the instrument to be generalizable across gender, culture, and age.[21] Internal reliability for domain scores consistently ranges from 0.86-0.95, and reliability for facet scales ranges from 0.56-0.90.[33–35]

2.3 Data collection

The program directors were contacted to obtain their consent and to assist with the data collection. After obtaining consent from the program directors, the informed consent letter and the link to the online survey containing the NEO FFI-3 personality inventory and question requesting the student to self-report their current GPA, were then forwarded to the students.

2.4 Data analysis

A multiple linear regression analyses was performed to assess relationship between select dimensions of personality and grade point average. Prior to the analysis, data for the missing responses and the presence of outliers were checked. Two respondents did not complete the NEO FFI-3 and were excluded from the analysis, leaving a final total of 93 participants. Presence of outliers were checked by computing standardized scores for each of the independent and dependent variables. One outlier for agreeableness was identified (1 value more than 3.29 standard deviations below the mean). The score was removed from the data prior to analyst.

The data was analyzed using the SPSS 22.0. Descriptive statistics were calculated and reported for the variables of interest (i.e., current GPAs, and the scores from the NEO FFI-3 personality inventory). Frequencies and percentages were computed for categorical variables and means, and standard deviations were computed for continuous variables. Additionally, inter-item reliability of the NEO FFI-3 subscales using Cronbach's alpha were assessed. All inferential analyses were conducted using an alpha level of .05. Composite scores for each of the NEO FFI-3 subscales according to the instructions in the NEO FFI-3 scoring manual were created. Composite scores were computed for each subscale according to the instructions of the NEO-FFI-3 scoring manual. This involved summing the responses of the items pertaining to each subscale after reverse-scoring appropriate items.

3. Results

3.1 Descriptive statistics

A total of 95 students responded to the study survey. Prior to the analysis, data for the missing responses and the presence of outliers were checked. Two respondents did not complete the NEO FFI-3 and were excluded from the analysis, leaving a final total of 93 participants. Presence of outliers were checked by computing standardized scores for each of the independent and dependent variables. One outlier for agreeableness was identified (1 value more than 3.29 standard deviations below the mean). The score was removed from the data prior to analysis.

The number of men (n = 46, 49.5%) and women (n = 47, 50.5%) in the final sample was almost equal, and the average age of the participants was 30.28 years (SD = 4.66). The duration of the nursing program for most participants was 24-30 months (n = 72, 77.4%), and the largest proportion of participants had been in their program for 6–12 months (n = 34, 36.6%). Participants' average GPA was 3.67 (SD = 0.29). See Tables 1 and 2 for the descriptive statistics for the categorical and continuous demographic variables respectively.

Table 1. Descriptive statistics for categorical variables

Variable	Frequency	Percent (%)
Gender		
Female	47	50.5
Male	46	49.5
Duration of nursing program		
24 months	21	22.6
24-30 months	72	77.4
Time in nursing program		
0-6 months	13	14.0
6-12 months	34	36.6
12-18 months	16	17.2
18-24 months	29	31.2
24-30 months	1	1.1

Note. Not all percentages may sum to 100.0% due to rounding error.

Table 2. Descriptive statistics for continuous variables

Variable	Mean	Std. Deviation
Age upon entering nurse anesthesia school	30.28	4.66
GPA	3.67	0.29

3.2 Reliability analysis

An inter-item reliability analysis using Cronbach's alpha to assess the reliability of the NEO FFI-3 subscales was conducted. Cronbach's alpha coefficients were evaluated using George and Mallery's (2010) suggestion that values of .7 or greater indicate acceptable reliability. The reliability coefficients for each subscale are presented in Table 3.

All reliability coefficients were at least .7, indicating that all of the subscales had acceptable reliability. Therefore, composite scores were computed for each subscale according to the instructions of the NEO-FFI-3 scoring manual. This involved summing the responses of the items pertaining to each subscale after reverse-scoring appropriate items. Descriptive statistics for the composite scores are presented in Table 4.

Table 3. Reliability coefficients for NEO-FFI-3 subscales

Variable	Number of Items	Cronbach's Alpha
Conscientiousness	12	.80
Openness to experience	12	.76
Extraversion	12	.82
Agreeableness	12	.70
Neuroticism	12	.84

Table 4. Descriptive statistics for NEO-FFI-3 subscales

Variable	Mean	Std. Deviation
Conscientiousness	37.33	5.14
Openness to experience	31.88	6.07
Extraversion	29.80	6.56
Agreeableness	34.96	5.00
Neuroticism	17.92	7.02

3.3 The research question

Research Question: What is the relationship between select dimensions of personality and GPA in nurse anesthesia students? A multiple linear regression was performed to address this research question. The independent variables in this analysis included conscientiousness, extroversion, neuroticism, agreeableness, and openness to experience. The dependent variable in this analysis was GPA. The standard method of variable entry was used for this analysis, meaning all of the independent variables were entered into the regression model at the same step.

The absence of multicollinearity and the assumptions of homoscedasticity and normality were evaluated preceding the analysis. The assumption of normality was assessed by examination of a Q-Q scatterplot (see Figure 1).

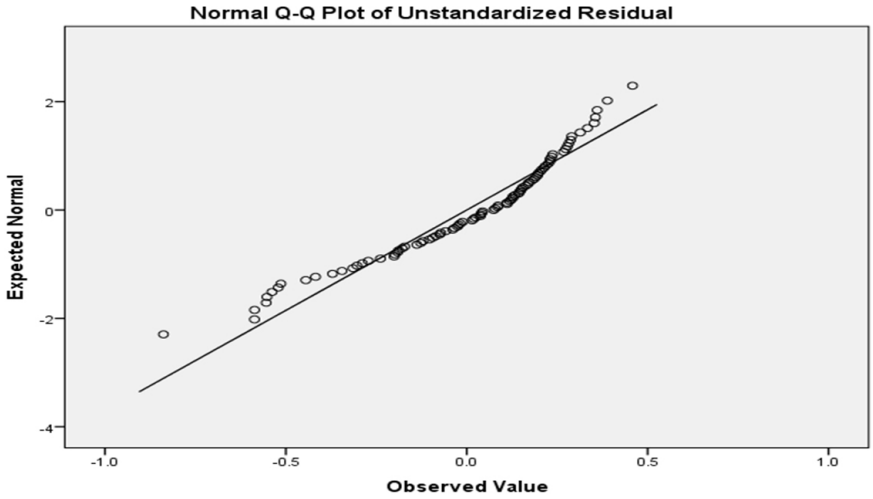

Figure 1. Q-Q scatterplot for the research question

The data did not strongly deviate from the normal line, so this assumption was met. Homoscedasticity was assessed by examination of a scatterplot of residuals versus predicted values (see Figure 2). The data were approximately equally spread out around zero, indicating that the assumption was met.

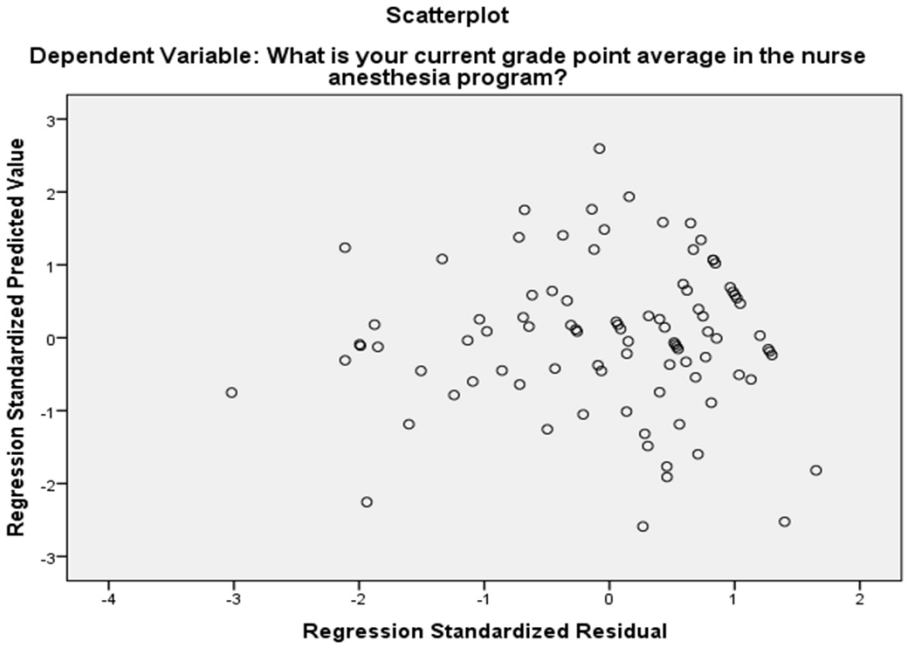

Figure 2. Residuals vs. predicted values for the research question

The assumption of absence of multicollinearity was assessed using VIFs. All VIF scores were below 10 (see Table 5), suggesting that multicollinearity was not a problem. The results of the overall regression model were marginally significant ($F(5, 85) = 2.33$, $p = .050$, $R^2 = .12$), indicating that the dimensions of personality were significantly related to current GPA. The R^2 value indicates that the dimensions of personality accounted for 12% of the variance in current GPA. An examination of individual regression coefficients (see Table 5) revealed that conscientiousness was significantly positively related to current GPA ($B = 0.02$, $p = .006$). Implicating that students who scored higher in conscientiousness tended to have higher current GPAs. However, none of the other regression coefficients were significant.

Table 5. Multiple linear regression predicting current GPA

Independent Variable	*B*	Std. Error	Beta	*t*	Sig.	VIF
Conscientious	0.02	0.01	0.33	2.82	.006	1.33
Openness	-0.01	0.01	-0.16	-1.50	.138	1.15
Extraversion	0.00	0.01	-0.05	-0.45	.652	1.17
Agreeableness	0.01	0.01	0.08	0.74	.459	1.13
Neuroticism	0.01	0.01	0.16	1.31	.194	1.46

Note. $F(5, 85) = 2.33$, $p = .050$, $R^2 = .12$.

4. Discussion

The purpose of this correlational research was to assess the association between the Five Factor Model (FFM) of personality traits and the grade point average (GPA) of students enrolled in a NAP. This research was conducted to identify a more objective way to evaluate a prospective students' personality that correlates with success in a NAP. However, possessing certain personality traits may be correlated to academic success, it is not possible to conclude whether a student succeeds academically or fails academically based on those personality traits.

The sample for the current research was collected from accredited NAPs, where participants' average age was 30.28 years (SD = 4.66). For most participants, the duration of the

NAP was 24-30 months (n = 72, 77.4%); the largest proportion of participants had been in their program for 6-12 months (n = 34, 36.6%). In the final sample, the number of men (n = 46, 49.5%) and women (n = 47, 50.5%) was almost equal. The demographics of the current research are consistent with the percentages of students taking Self-Evaluation Examination and the National Certification Examination reported by the National Board of Certification and Recertification for Nurse Anesthetists in 2016. To assess if a relationship exists amongst the FFM of personality and GPA for students in NAPs, the following research question was posed:

4.1 The research question

What is the relationship between select dimensions of personality and grade point average in nurse anesthesia students?

The independent variables in this analysis included conscientiousness, extroversion, neuroticism, agreeableness, and openness to experience. The dependent variable in this analysis was GPA. The results were marginally significant, indicating that the dimensions of personality were significantly related to current GPA. The dimensions of personality accounted for 12% of the variance in current GPA. An examination of individual regression coefficients revealed that conscientiousness was significantly positively related to current GPA. This means that students who scored higher in conscientiousness tended to have higher current GPAs. However, none of the other regression coefficients were significant.

The study presented a positive correlation between the traits of conscientiousness on GPA in students enrolled in a NAP. The study was able to demonstrate that nurse anesthesia students that scored high in conscientiousness also reported a higher GPA. Conscientious individuals tend to take the time to reflect carefully before acting, are dependable, and goal orientated.[31] Furthermore, they are hard-working, persistent, and always have a sense of where they are heading. Their self-discipline enables them to get things done even when the task at hand is mundane. Individuals that score high in conscientious feel well prepared to attack life's challenges with a plan. They are also high achievers as they tend to have high aspiration levels.[31]

Students who score high in conscientiousness on a personality inventory are more likely to have very specific academic goals that they achieve by a disciplined duteous work ethic. Academic success and the grit to complete a task are other attributes of students that score high in conscientiousness.[36] Academic grit is positively correlated with conscientiousness, which has been evidenced by students taking on more challenging course work.[37] Therefore, it may be advantageous for a NAP to consider this non-traditional variable when admitting students into the program. Subsequently, individuals who score low in conscientiousness on a personality inventory concede to low self-esteem and lack confidence in their abilities. They tend to be disorganized, unreliable, satisfied with low levels of achievement, and are procrastinators.[36] Consequently, those would be undesirable traits that may lead to academic failure in a NAP. Hence, it may be strategic for a NAP program to be more cautious of admitting students that score low in this personality trait. As these individuals who lack conscientiousness have a tendency to act before thinking and are not likely to stay on task and complete their goals.[37] Conscientiousness has reliably been able to have predictability for academic success from preschool to adults in higher education.[38,39] Remarkably, conscientiousness identified in a child has been able to predict academic accomplishment of that child at ages 20 and 30.[40–46] Furthermore, after controlling for SAT scores, level of conscientiousness predicts college grades. A high level of conscientiousness is associated with the personal characteristics that are essential for learning and academic success.[41]

It is of worth to note that with an average GPA of over 3.6, the students in this study can be considered successful in their respected NAP and while neuroticism did not significantly correlate with current GPA, it was the lowest score of all the five factors of personality traits. According to McCrae and Costa[31] neurotic individuals experience a fearful disposition with apprehension, worry, anger, and nervousness. These individuals tend to become embarrassed and self-conscious, and they tend to feel uncomfortable around others.[31] High scorers are temperamental and are prone to feelings of loneliness, hopelessness, and guilt, which may lead to anxiety, depression, hostility, and feelings of inferiority.[31] The susceptibility makes them prone to stress and unable to cope, and they panic in times of emergency.[31] Once more, those would be undesirable traits that can lead to academic failure in a NAP. NAP admissions committees should be cautious of admitting candidates that score high in neuroticism on an FFM of personality inventory. Low scorers are slow to anger and less disturbed by awkward social situations, finding it easier to control temptations and handle themselves in difficult situation,[36] which again was the lowest scored personality trait on this sample of successful students. Even for the most experienced interviewer, it would be extremely difficult to determine a prospective candidates' level of conscientiousness and/or neuroticism in a twenty-minute face to face interview.

4.2 Limitations

The research had several limitations. The students may not have completed the survey truthfully, which may lead to

questionable results. It was determined that a correlation existed, consequently a multiple regression analysis may have detected the presence of an association between variables where no association existed. Furthermore, this research does not determine causation.

5. Conclusion

A positive correlation between conscientiousness and GPA was established. Furthermore, the study demonstrated that students scored highest in conscientiousness and lowest in neuroticism. Along with being successful in their NAP, as evidenced by a mean current GPA of greater than 3.6. The evidence may change the way candidates are assessed for admissions. NAP directors are well positioned to support and implement this type of change. The outcome of this correlational study may be beneficial in shaping admission criteria for a NAP. Changing traditionally established admission criteria based on the best evidence is aimed at aligning admission criteria with academic success in a NAP.[46] The development of precise personality traits that predict academic success may lead to lower attrition rates in a NAP. The research, as well as the literature, align and supports the need to change the admissions process and evaluate additional variables, such as personality, to evaluate a student's potential for successful completion of a program.[47] The results of a change initiative may support successful student progression and greater academic success in a NAP.

Conflicts of Interest Disclosure

The author declares that there is no conflict of interest.

References

[1] Ortega KH, Burns SM, Hussey LC, et al. Predicting success in nurse anesthesia programs: an evidence-based review of admission criteria. AANA J. 2013; 81: 183. PMid:23923668

[2] Standards for accreditation of nurse anesthesia programs. Park Ridge, IL: Council on Accreditation of Nurse Anesthesia Educational Programs. 2015.

[3] American Association of Nurse Anesthetists. What potential students need to know about the nurse anesthesia educational program interview process. Available from: http://www.aana.com/ceandeducation/becomeacrna/Pages/What-Potential-students-need-to-Know-about-the-Nurse-Anesthesia-Educational-Program-Interview-Process.aspx

[4] Wilson JT, Gibbons S, Wofford K. Process improvement: Addressing attrition from the uniformed services university of the health sciences nurse anesthesia program. AANA J. 2015; 83(5): 351-356. PMid:26638457

[5] Banker M. Watchful care: A history of America's nurse anesthetists. New York, NY: Continuum. 1993.

[6] Gunn I. The history of nurse anesthesia education: Highlights and influences. Report of the National Commission on Nurse Anesthesia Education. AANA J. 1991; 59(1): 53-61. PMid:2000711

[7] Burns S. Predicting academic progression for student registered nurse anesthetists. AANA J. 2011; 79(3): 193-201. PMid:21751688

[8] Council on Accreditation of Nurse Anesthesia Educational Programs. Accreditation policies and procedures. Park Ridge, IL: COA. 2016.

[9] Kreiter CD, Yin P, Solow C, et al. Investigating the reliability of the medical school admissions interview. Adv Health Sci Educ Theory Pract. 2004; 9(2): 147-59. PMid:15141132 https://doi.org/10.1023/B:AHSE.0000027464.22411.0f

[10] Megginson L. Exploration of nursing doctoral admissions and performance outcomes. J Nurs Educ. 2011; 50: 502-512. PMid:21598860 https://doi.org/10.3928/01484834-20110517-04

[11] Hulse JA, Chenowith T, Lebedovych L, et al. Predictors of student success in the US Army Graduate Program in Anesthesia Nursing. AANA J. 2007; 75: 339. PMid:17966677

[12] Furnham A, Monsen J, Ahmetoglu G. Typical intellectual engagement, big five personality traits, approaches to learning and cognitive ability predictors of academic performance. Br J Educ Psychol. 2009; 79: 769-782. PMid:19245744 https://doi.org/10.1348/978185409X412147

[13] Griffin B, Wilson I. Associations between the big five personality factors and multiple mini-interviews. Adv Health Sci Educ Theory Pract. 2012; 17: 377-388. PMid:21751103 https://doi.org/10.1007/s10459-011-9316-1

[14] Molinuevo B, Torrubia R. Does personality predict medical students' attitudes to learning communication skills? Int J Med Educ. 2013; 4: 155. https://doi.org/10.5116/ijme.51f4.f2de

[15] Sedlacek WE. Alternative admissions and scholarship selection measures in higher education. Meas Eval Couns Dev. 2003; 35: 263.

[16] Thoresen CJ, Bradley JC, Bliese PD, et al. The big five personality traits and individual job performance growth trajectories in maintenance and transitional job stages. J Appl Psychol. 2004; 89: 835-853. PMid:15506864 https://doi.org/10.1037/0021-9010.89.5.835

[17] Soto CJ, Kronauer A, Liang JK. Five-factor model of personality. John Wiley and Sons, Inc; 2013.

[18] Detrick P, Chibnall JT, Luebbert MC. The revised neo personality inventory as predictor of police academy performance. Crim Justice Behav. 2004; 31: 676-694. https://doi.org/10.1177/0093854804268751

[19] Goldberg LR. The development of markers for the big-five factor structure. Psychol Assess. 1992; 4: 26-42. https://doi.org/10.1037/1040-3590.4.1.26

[20] Goldberg LR. An alternative Conard MA. Aptitude is not enough: How personality and behavior predict academic performance. J Res Pers. 2006; 40: 339. https://doi.org/10.1016/j.jrp.2004.10.003

[21] Hojat M, Erdmann JB, Gonnella JS. Personality assessments and outcomes in medical education and the practice of medicine: AMEE Guide No. 79. Med Teach. 2013; 35: e1267-e1301. PMid:23614402 https://doi.org/10.3109/0142159X.2013.785654

[22] Jensen M. Personality traits, learning and academic achievements. J Educ Learn. 2015; 4(4): 91-118. https://doi.org/10.5539/jel.v4n4p91

[23] Tok S, Morali S L. Trait emotional intelligence, the big five personality dimensions and academic success in physical education

teacher candidates. Soc Behav Pers. 2009; 37(7): 921-931 https://doi.org/10.2224/sbp.2009.37.7.921

[24] Fagan R, Squitiera P. The relationship between personality characteristics and academic success in law school. Eval Res Educ. 2002; 16(2): 95. https://doi.org/10.1080/09500790208667010

[25] Kyllonen P, Walters AM, Kaufman JC. Noncognitive constructs and their assessment in graduate education: A review. Educ Assess. 2005; 10: 153-184. https://doi.org/10.1207/s15326977ea1003_2

[26] Aguilar AJ. The big five personality factors as predictors of graduate school performance (Order No. AAI3554794). Available from PsycINFO. (1494002051; 2013-99241-155). Available from: http://search.proquest.com/docview/1494002051?accountid=166133

[27] Ferguson E, Sanders A, O'Hehir F, et al. Predictive validity of personal statements and the role of the five-factor model of personality in relation to medical training. J Occup Organ Psychol. 2000; 73(3): 321-344. https://doi.org/10.1348/096317900167056

[28] Gibby RE, Zickar MJ. A history of the early days of personality testing in American industry: An obsession with adjustment. Hist Psychol. 2008; 11: 164-184. PMid:19048975 https://doi.org/10.1037/a0013041

[29] McCrae RR. Personality theories for the 21st century. Teaching Psychol. 2011; 38:209-214.

[30] O'Connor MC, Paunonen SV. Big Five personality predictors of post-secondary academic performance. Pers Indiv Differ. 2007; 43: 971-990. https://doi.org/10.1016/j.paid.2007.03.017

[31] McCrae RR, Costa PT. NEO inventories for the neo personality inventory-3, neo five-factor inventory-3, and neo personality inventory-revised: Professional manual. Lutz, FL: PAR; 2010.

[32] Haritos G, Shumway SH, Austin PN, et al. Nurse anesthesia admission qualifications. AANA J. 244-248.

[33] P.T C. Work and personality: Use of the neo-pi-r in industrial/organizational psychology. Appl Psychol. 1996; 45: 225-242. https://doi.org/10.1111/j.1464-0597.1996.tb00766.x

[34] Garcia D, Nima AA, Rappe C, et al. The relationship between the jobmatchtalent test and the neo pi-r: construct validation of an instrument designed for recruitment of personnel. PloS one. 2014; 9: e90309.

[35] Costa PT, McCrae RR, Kay GG. Persons, places, and personality: Career assessment using the revised neo personality inventory. J Career Assess. 1995; 3: 123-139.

[36] Baldacchino DR, Galea P. Student nurses' personality traits and the nursing profession: part 1. Br J Nurs. 2012; 21: 419-425. PMid:22585020 https://doi.org/10.12968/bjon.2012.21.7.419

[37] Spengler M, Lüdtke O, Martin R, et al. Personality is related to educational outcomes in late adolescence: Evidence from two large-scale achievement studies. J Research Pers. 2013; 47: 613-625. https://doi.org/10.1016/j.jrp.2013.05.008

[38] Ackerman PL, Heggestad ED. Intelligence, personality, and interests: Evidence for overlapping traits. Psychol Bull. 1997; 121: 219-245. https://doi.org/10.1037/0033-2909.121.2.219

[39] O'Connor MC, Paunonen SV. Big five personality predictors of post-secondary academic performance. Pers Individ Dif. 2007; 43: 971-990.

[40] de Fruyt F, Mervielde I. Personality and interests as predictors of educational streaming and achievement. Eur J Pers. 1996; 10: 405-425. https://doi.org/10.1002/(SICI)1099-0984(199612)10:5<405::AID-PER255>3.0.CO;2-M

[41] Noftle EE, Robins R. Personality predictors of academic outcomes: Big five correlates of GPA and SAT scores. J Pers Soc Psychol. 2007; 93: 116-130. PMid:17605593 https://doi.org/10.1037/0022-3514.93.1.116

[42] Shiner RL, Masten AS. Transactional links between personality and adaptation from childhood through adulthood. J Res Pers. 2002; 36: 580-588. https://doi.org/10.1016/S0092-6566(02)00508-1

[43] Shiner RL, Masten AS, Roberts JM. Childhood personality foreshadows adult personality and life outcomes two decades later. J Pers. 2003; 71: 1145-1170. PMid:14633061 https://doi.org/10.1111/1467-6494.7106010

[44] Wagerman S, Funder D. Acquaintance reports of personality and academic achievement: A case of conscientiousness. J Res Pers. 2007; 41: 221-229. https://doi.org/10.1016/j.jrp.2006.03.001

[45] Vianello M, Robusto E, Anselmi P. Implicit conscientiousness predicts academic performance. Pers Individ Dif. 2010; 48: 452-457. https://doi.org/10.1016/j.paid.2009.11.019

[46] Pellegrini JE. Using evidence-based practice in nurse anesthesia programs. AANA J. 2006; 74: 269. PMid:16918118

[47] Kyllonen P, Walters AM, Kaufman JC. Noncognitive constructs and their assessment in graduate education: A review. Educ Assess. 2005; 10: 153-184. https://doi.org/10.1207/s15326977ea1003_2