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Relationship between Central Virginia Community College Respiratory Therapy Technology Program Students Entrance GPA and Their Graduation Success

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RELATIONSHIP BETWEEN CENTRAL VIRGINIA COMMUNITY COLLEGE
RESPIRATORY THERAPY TECHNOLOGY PROGRAM STUDENTS ENTRANCE
GPA AND THEIR GRADUATION SUCCESS

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

CHAPTER I

INTRODUCTION

The need for qualified healthcare professionals is a reality and academically strong students may satisfy that demand. It is imperative to search for students who have the greatest chance to successfully graduate from a medical program and pass the national boards. It is easy to assume that grade point average (GPA) is a reflection of academic success, but is it directly related? The relationship between GPA and successful graduation from a technology program as it relates to program admission deserves a thorough analysis. Standardized tests are also widely used as a measurement tool for college admission, but these will not be addressed in this study.

Oehrlein (2009) stated, "The results show that college GPA is a very significant determinant of income. GPA appears to be a fair measure of human capital after graduation" (p. 22). Research shows that GPA and income after college graduation are related; so one would anticipate that GPA and academic success are directly related. GPA continues to be a strong component of college admissions as well as standardized tests like SAT or ACT. "Standardized test scores—such as the SAT— and high school grade point average (HSGPA) are among the most widely used data for determining admission into college" (Warne, Nagaishi, Slade, Hermesmeyer, & Peck, 2014, p. 262).

Standardized tests and grades continue to be an important measuring tool to determine the success of college students. This assumption continues to drive college admission decisions because both have been accurate predictors of the preparedness and success of college students. Warne, Nagaishi, Slade, Hermesmeyer, and Peck (2014) wrote, "A recent survey showed that the only criteria that a majority of college

admissions officers deemed to be of "considerable importance" were grades in college preparation courses (84.3%), the strength of a student's curriculum (67.7%), standardized college admission tests scores (59.2%), and overall HSGPA (51.9%)" (p. 262).

Considering the current shortage of healthcare professionals and the prediction that it will continue to get worse, medical programs will benefit from quality students. Medical training programs will find it necessary to use standardized tests and GPA to admit students that are most likely to have long-term success. Radunzel and Noble (2012) suggested that if colleges wanted students with the highest likelihood of success, the ACT and HSGPA should be considered because both are related to college success in the first year and subsequent years (p. 48).

STATEMENT OF THE PROBLEM

The problem of this study was to determine the relationship between Central Virginia Community College (CVCC) Respiratory Therapy Technology Program students entrance GPA and their graduation success to determine if minimum entrance GPA should be increased from 2.0 to 2.5.

RESEARCH GOALS

To solve this problem the following hypothesis was established:

H_1: There is a direct correlation between students' GPA and respiratory therapy graduation success.

BACKGROUND AND SIGNIFICANCE

In 1943, Dr. Edwin Levine started the 71-year history of respiratory therapy by establishing an on-the-job training inhalation therapy program. This primitive program was started in a Chicago hospital. Dr. Levine and other physicians formed the Inhalation

Therapy Association (ITA) in 1946 and in 1954 it was renamed the American Association of Inhalation Therapists (AAIT). Inhalation therapists remained on-the-job educated and without credentials until 1957 when the first educational program opened and in 1960 the first national examinations were administered for formal registry credentials. Prior to 1960, inhalation therapists were considered "tank jockeys". The American Medical Association (AMA) approved and supported inhalation therapy schools. In 1969, a Technician Certification Program offered credentials to those who did not qualify to take the Registry exam. The next most significant occurrence was in 1982 when California passed the first modern licensure law governing the profession of respiratory care, and President Reagan proclaims the first National Respiratory Care Week (Weilacher, 2015). By 2004, every state except Alaska and Hawaii had state licensure.

Today, certification programs no longer exist and entry into the field requires passage of a national registry exam, which includes a written exam and clinical simulation exam. Eligibility to sit for the registry exam is successful completion of a Commission on the Accreditation for Respiratory Care (CoARC) approved educational program. Most major medical centers in the United States are either requiring a Bachelor of Science degree in Respiratory Therapy/Health Sciences or requiring completion within five years of employment. There are many specialized credentials respiratory therapists can earn through passage of a national exam, such as Neonatal Perinatal Specialist (NPS), Adult Critical Care Specialist (ACCS), and Registered Pulmonary Function Therapist (RPFT). The profession is currently starting a movement toward Advanced Specialist, which would be similar to Nurse Practitioner.

Little research exists that examines the relationship between GPA and academic success in a respiratory therapy program. The lack of research clearly presents significant reasoning behind this study. Until the correlation between GPA and academic success in a respiratory therapy program is assessed, the attrition rate will continue to be an issue. The admittance of quality students who are most likely to succeed is an important aspect in reducing the attrition rate and continuing to ensure success of the respiratory therapy profession.

LIMITATIONS

The limitations of the study were as follows:

1. The results of the study were confined to the Central Virginia Community College Respiratory Therapy Technology Program.

2. The admission grade point average of 49 CVCC Respiratory Therapy Technology Program students was used.

3. The grade point averages utilized in the data collection were from four cohorts starting in August 2010, 2011, 2012, and 2013.

ASSUMPTIONS

The researcher made the following assumptions:

1. Students admitted in the respiratory therapy technology program in years 2010 through 2013 had a GPA of at least 2.0.

2. Students had aspirations and the physical abilities to be in a healthcare profession.

3. Instructors teaching respiratory therapy classes have the education and experience to teach these classes.

4. Program content follows accreditation requirements.

5. Students successfully complete five semesters to graduate with an Associate of Applied Science in Respiratory Therapy Technology.

PROCEDURES

Respiratory Therapy Technology students at Central Virginia Community College were used to facilitate this study. The four cohorts started in August of their respective year with all respiratory therapy classes delivered consecutively each semester. Students attended classes two days per week, clinical experience two days per week, and laboratory one day per week. Students maintained a "C" average (2.0) to continue in the program. The study was quasi-experimental in nature. Students' GPA upon entrance to the program was used for the purpose of this study. Student information was obtained from respiratory therapy student files held by the CVCC Respiratory Therapy Technology program. Students' final grades for all respiratory therapy classes were reviewed to ensure adherence to GPA requirement. Any students who did not meet the GPA requirement during the semester or at the end of the semester were released from the program. At the end of the fifth semester, all remaining students graduate. The initial four cohorts with a total of 49 students were compared to students that graduated. The GPA of each student admitted to the program was compared to those who did not graduate and those who did graduate to determine if entrance GPA should be increase from 2.0 to 2.5. A comparison was made between entrance GPA and those students who graduated from the program and those who failed out of the program and did not graduate. This comparison was used to determine if entrance GPA was a determining

factor as to whether a student would successfully graduate from the program or not graduate.

DEFINITION OF TERMS

The following is a list of terms and definitions to assist the reader in comprehending this study.

1. Accreditation – a quality assurance process in which an external agency evaluates an educational program that grants a certificate stating applicable standards are met.

2. American Medical Association (AMA) - professional society for medical physicians.

3. Commission on the Accreditation for Respiratory Care (CoARC) – agency that accredits respiratory therapy educational programs.

4. GPA – grade point average.

5. Healthcare professional – a person who holds a college degree in a medical field and works in a facility that treats people with an illness.

6. Inhalation therapy – the original name of a medical field that took care of patients with respiratory disorders.

7. Respiratory Therapy Technology – healthcare profession that specializes in caring for patients with cardiopulmonary disease, formally known as inhalation therapy.

OVERVIEW OF CHAPTERS

Chapter I introduced the use of grade point average (GPA) as a determining factor for college admission and how it relates to success in a medical technology program.

Literature supports the use of standardized tests and GPA as a factor for determining college admission, but there is a lack of current research in identifying the correlation between entrance GPA and successfully graduating from a medical technology program. The problem of this study was to determine the relationship between Central Virginia Community College (CVCC) Respiratory Therapy Technology Program students entrance GPA and their graduation success to determine if minimum entrance GPA should be increased from 2.0 to 2.5. Student respiratory therapy academic files were used to compare entrance GPA to students who graduated from the program or failed out of the program. A list of definitions was provided to assist the reader in understanding study terminology.

Chapter II, Review of Literature, will reinforce the use of GPA as a forecaster of academic success as well as an appropriate method for this study's problem. The Review of Literature will also give credence to the need for further investigation into the relationship between GPA and academic success in a medical technology program. Chapter III, Methods and Procedures, gives a description of the methods and procedures utilized in collecting data for the study. Chapter IV, Findings, contains the data analysis and the results of the study. Chapter V, Summary, Conclusions, and Recommendations, gives a summary of the study results, ascertain conclusions established on the findings, and express recommendations determined from the conclusions.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this quasi-experiment was to show that entrance grade point average (GPA) is a significant determining factor as to whether a student will successfully complete the Respiratory Therapy Program. Literature will support the use of GPA as a determining factor of college entrance as well as college success in a degree program. Evidence is provided that supports the purpose of this quasi-experimental study and the need to examine the effect of GPA and academic success in a respiratory therapy program.

HISTORY AND GROWTH OF THE RESPIRATORY THERAPY PROFESSION

Respiratory Therapy is a relatively young profession that continues to grow and evolve. The evolution of a profession is an important factor as well as its professional society. Weilacher (2015) wrote, "The quintessential hallmark of any profession is its professional society. On July 13, 1946, a diverse group of "oxygen orderlies," physicians, nurses, and other interested people met at the university of Chicago to form the Inhalation Therapy Association" (p. 1). At this time, the birth of a new profession emerged. Today, respiratory therapy consists of highly skilled clinical specialists that manage the cardiopulmonary system of critically ill patients, work as patient educators, develop rehabilitation plans for cardiopulmonary patients, and advocate for patient care. Respiratory therapists work in the "trenches" with physicians and nurses.

The need for formal accredited education was introduced in 1950 and in 1954 the first educational establishment was formed. Initially, respiratory therapy was a certificate program that no longer exists. The minimum education is now an Associate in Applied

Science in Respiratory Therapy. Graduates are highly encouraged to continue their education by obtaining a Bachelor of Science degree and a Master of Science degree. Currently, California and Ohio have adopted a Bachelor of Science as entry into obtaining a job in respiratory therapy. There is little research that compares the relationship of GPA and academic success in respiratory therapy or any another allied health profession.

THE USE OF GRADE POINT AVERAGE IN EDUCATION

The use of GPA in education is a long tradition in conjunction with standardized test scores. Warne, Nagaishi, Slade, Hermesmeyer, and Peck (2014) wrote, "HSGPA carries more weight than any other factor in the college admissions process. GPA and class rank are two of the four most important criteria to consider when deciding whether a student will be admitted to college" (p. 262). The use of GPA is a simplistic way to equate applicants' academic abilities and potential. It is an overall measurement of academic success and a reliable assessment tool for future academic success.

GPA is also used in research and in athletics, but is it the best method for determining the academic success of students?

> A newspaper article about last year's PAC-10 conference football coach of the year reported that the amount of a bonus payment to the coach was directly tied to the team GPA for scholarship players. In the world of research, equal importance is placed on GPAs as a viable outcome measure (dependent variable). (Volwerk & Tindal, 2012, p. 17)

Final grades in a course are what determine the grade points appointed for that course. Traditionally, letter grades are awarded GPA points on a four-point or five-point

system. GPA points awarded to a letter grade on a four point system is as follows: A is 4.0 GPA points, B is 3.0 GPA points, C is 2.0 GPA points, D is 1.0 GPA points, and F is 0 GPA points. GPA points awarded to a letter grade on a five point system is as follows: A is 5.0 GPA points, B is 4.0 GPA points, C is 3.0 GPA points, D is 2.0 GPA points, and F is 0 GPA points. Cumulative GPA is what is assessed for college admission. Merritt (2014) wrote, "Cumulative GPA is also a statistically significant predictor of high school students' future performance, academic achievement, and success in postsecondary education" (p. 1).

Data mining software is an analytical tool used to analyze data. Tekin (2014) used educational data mining (EDM) theory to determine if hidden information was available in databases to help predict educational data. He used neural networks (NN), extreme learning machine (ELM), and support vector machines (SVM) to assist with predicting educational data. Tekin (2014) wrote, "If students are predicted to have low GPAs at graduation, then extra efforts can be made to improve their academic performance and, in turn, GPAs" (p. 207). His findings reported that the three model types, NN, ELM, and SVM, were able to predict student GPA at graduation. The SVM produced results that were the most accurate and ELM was the second in predicting the most accurate results. The use databases like NN, ELM, and SVM could be an option in predicting the success of students who are admitted to the respiratory therapy program.

THE USE OF GRADE POINT AVERAGE AS AN EVALUATION INSTRUMENT

The use of GPA in college admissions has been used as one predictor of college success as well as standardized tests. Four-year colleges and universities use Scholastic

Aptitude Test (SAT), American College Testing (ACT), and GPA as predictors of college success. Sawyer (2013) wrote,

> Obviously, some reasons relate to promoting academic success: enrolling students who are most likely to succeed, making course placement decisions, and making scholarship decisions. Another reason is objectivity: to include in decision making a component that can be interpreted the same way for all applicants (thus, serving as a balance to the lack of standardization in high school grades). (p. 90)

Community colleges have open-door policies, which means they accept any student who wants to take college courses. Therefore, the use of standardized tests is not feasible for select programs offered at community colleges. Select programs, like a respiratory therapy program, have to rely on other methods to determine academic success. Central Virginia Community College Respiratory Therapy Program relies on high school GPA and college GPA, a personal interview, and an essay to determine students most likely to successfully graduate from the program. Sawyer (2013) wrote, "Two common goals related to academic achievement are: (1) To maximize academic success among enrolled students and (2) To identify accurately those applicants who could benefit from attending the institution and to enroll as many of them as possible" (p. 90). The Central Virginia Community College Respiratory Therapy Program is limited to admitting 20 students per academic year, but the goal is to choose students that will academically succeed and personify the expectations of a healthcare professional. The use of GPA in the respiratory therapy program is one variable, but another variable is outcomes. The Commission on the Accreditation for Respiratory Care (CoARC) sets outcome standards for all respiratory therapy programs. The Attrition Rate is one such

outcome that relates to the acceptance of students into a respiratory therapy program. CoARC mandates a 3-year maximum average of 30%.

Grade point average is an important part of the college experience and it can define your success. Students do not get another chance to build their GPA, which starts in high school and continues through college. Zaharatos (2009) wrote,

> Your GPA reflects all the energy you expended while in school. A high GPA will display dedication to diligent study, class participation, completing assignments on time and doing well on tests. (p. 72)

A grade point average can follow one through life in the same manner as a credit score. They both take hard work and discipline, which can define your success in life. "A study found that those students who managed their personal lives well and practiced healthy lifestyle habits had a GPA of 3.31 or higher, compared to 2.99 or lower for those students who lacked an overall organized and healthy lifestyle" (Zaharatos, 2009, p. 74).

RESPIRATORY THERAPY ACADEMIC SUCCESS INVESTIGATION

The literature supported the use of grade point averages in assessing past academic success and future academic success in four-year educational institutions. Literature did not identify the use of GPA with future academic success in a community college and specifically allied health programs. Currently, traditional students account for the majority of college students, but the rise of non-traditional students continues to increase. Wladis, Hachey, and Conway (2015) define non-traditional students as "delayed enrollment, no high school diploma, part-time enrollment, financially independent, have dependents, single-parent status, and working full-time" (p. 2). The majority of students that apply for admission into the Central Virginia Community College Respiratory

Therapy Program are non-traditional students. These students are diverse and want to obtain an education in a limited time frame that will allow them to provide for their families.

The importance of selected students, who have the best chance of successfully graduating from the respiratory therapy program, is the reason student selection is an ominous task. For this reason, research needs to focus on these non-traditional students who have a desire to work in the medical profession. The lack of literature that delves into community college selective programs and admission criteria supports the need for this quasi-experiment.

SUMMARY

The Review of Literature has indicated the importance of using grade point average as an instrument to assess past academic success and predicting future academic success. The researcher identified the success of using grade point averages as an evaluation instrument to determine if a student is a candidate for Central Virginia Community College Respiratory Therapy Program. The purpose of the GPA evaluation is to minimize attrition and predict successful student graduation from the program. The researcher supported the need for this quasi-experiment with a lack of literature in assessing student success in respiratory therapy programs or other allied health programs.

Chapter III, Methods and Procedures, will describe the methods and procedures utilized in this study by the researcher. A description of the composed population is included in Chapter III. The tools utilized in the collection and gathering of data are presented in this chapter as well as the statistical instruments utilized to process and analyze the data.

CHAPTER III

METHODS AND PROCEDURES

Chapter III, Methods and Procedures, gives a description of the methods and procedures utilized in collecting data for the study. The focus of this study is to investigate the relationship between Central Virginia Community College Respiratory Therapy Technology program students' entrance grade point average (GPA) and their graduation success. This chapter will provide details on the population, research variables, instrument design, methods of data collection, and statistical analysis.

POPULATION

The population was composed of respiratory therapy students at Central Virginia Community College. There are four cohorts of students. The students that did not graduate because of personal reasons were eliminated from each group. The first group started with 13 students in August 2010 and 10 successfully graduated in May 2012. The second group started with 13 in August 2011 and 11 successfully graduated in May 2013. The third group started with 9 in August 2012 and 7 successfully graduated in May 2014. The fourth group started with 14 in August 2013 and 9 successfully graduated in May 2015.

RESEARCH VARIABLES

The independent variable in this study was the entrance grade point averages (GPAs) of Central Virginia Community College respiratory therapy students. The entrance GPA was collected prior to acceptance into the respiratory program and was cumulative based on all college courses taken prior to program admission. The GPA was collected on the students that started the respiratory therapy program in August of 2010,

2011, 2012, and 2013. The dependent variable is successful graduation from the respiratory therapy program. Students must maintain a 2.0 GPA to remain in the program.

INSTRUMENTS USED

The first instrument used in this study is the GPA report prior to admission into the Central Virginia Community College Respiratory Therapy Program. The second instrument used in this study is the list of graduates from the program.

METHODS OF DATA COLLECTION

Data collection entailed collecting admission cumulative GPA from the student file held by the Central Virginia Community College Respiratory Therapy Program Head. Data were collected on students admitted to the program in August 2010, 2011, 2012, and 2013. The researched compiled the information based on entrance year and then separated the students into three sub-groups: those who graduated, those who did not graduate because of personal reasons, and those who did not graduated because of academics. Students who did not graduate because of personal reasons were eliminated from the study.

STATISTICAL ANALYSIS

The researcher collected the admission cumulative GPA on all students admitted into the Central Virginia Community College Respiratory Therapy Program in August 2010, 2011, 2012, and 2013. The basis of the information collected was to compare admission cumulative GPA to those who graduated or did not graduate because of academia. Graduates of the respiratory therapy technology program will be separated into two categories: Graduates with an entrance GPA 2.0 – 2.49 and Graduates with an entrance GPA 2.50 and higher. Student names and other personal information will not be

used, instead, students will be referred to as a number. The chi-square test method of statistical analysis was used to determine the effect between admission cumulative GPA and those who graduate and those who did not graduate due to academic shortcomings.

SUMMARY

Chapter III offered detailed information about the study that includes population, instrument use, data collection, and statistical analysis. The population included details about the students as well as the independent and dependent variables of the study. The chi-square test method was used to test the hypothesis. In Chapter IV, the researcher will present the results of the findings.

CHAPTER IV

FINDINGS

The problem of this study was to determine the relationship between Central Virginia Community College (CVCC) Respiratory Therapy Technology Program students entrance GPA and their graduation success to determine if minimum entrance GPA should be increased from 2.0 to 2.5. This chapter contains data obtained from students who entered the program in August 2010, 2011, 2012, and 2013 and graduated in May 2012, 2013, 2014, and 2015. These data were used to determine if the study could support an increase in entrance GPA from 2.0 to 2.5 for the Respiratory Therapy Program.

RESULTS

The researcher analyzed individual Respiratory Therapy Program entrance grade point averages. The entrance GPA was placed into the appropriate group, GPA 2.0-2.49 or GPA 2.5 or greater. A Chi-square test was applied to the two groups of student's entering the Respiratory Therapy Program and those graduating two years later. It was used to ascertain whether there is an association between entrance GPA and successfully completing CVCC's Respiratory Therapy Technology Program. The GPA of forty-nine students, who entered CVCC's Respiratory Therapy Technology Program in August 2010, 2011, 2012, and 2013, was used and compared to those students who actually graduated in May 2012, 2013, 2014, and 2015. These data were used to discover if a significant association exists between the two variables.

DATA ANALYSIS

The average GPA of the 2.0-2.49 group was 2.218 and the average GPA of the 2.5 or greater group was 3.276. The 2.0-2.49 GPA group encompassed 14 students in which 8 students graduated from the program. The 2.5 or greater GPA group encompassed 35 students in which 30 students graduated. Data were analyzed using the Chi-Square test and the result is $X^2 = 4.689$ and the p value is 0.0303. This result is significant at the $p < 0.05$ level of significance. Therefore, the hypothesis is accepted and it can be said that there is a direct correlation between students' GPA and respiratory therapy graduation success. Table 1 contains the individual GPA for respiratory therapy students and their graduation status. Figure 1 contains the data analysis and Figure 2 contains the calculation of research data. Appendix A contains the chi-square distribution table.

TABLE 1

Respiratory Therapy Students

	GPA 2.0 – 2.49	GPA 2.5 or greater	Graduate		GPA 2.0 – 2.49	GPA 2.5 or greater	Graduate
Student				Student			
1	2.133		2012	27		2.87	2014
2	2.444		2012	28		3.222	2014
3		3.0	2012	29		3.9	No
4		3.129	2012	30		2.750	2014
5		3.5	2012	31	2.34		No
6	2.229		No	32		3.5	2014
7		4.0	2012	33		3.0	2014
8	2.077		No	34		2.853	2014
9	2.0		2012	35		4.0	2014
10		2.667	2012	36		2.875	2015
11	2.058		No	37		3.727	2015
12		3.806	2012	38		2.97	2015
13		3.462	2012	39	2.406		2015
14		3.391	2013	40		3.6	2015
15	2.32		2013	41		2.67	2015
16	2.44		2013	42		4.0	2015
17		4.0	2013	43		3.7	2015
18		3.143	2013	44		2.650	2015
19		2.76	2013	45		3.61	No
20		2.5	2013	46		2.722	No
21		3.462	2013	47		3.351	No
22	2.365		2013	48	2.03		No
23		4.0	2013	49		2.741	No
24		3.118	2013	Total	31.0523	114.649	
25	2.0		No	Average	2.218	3.276	
26	2.21		2013				

FIGURE 1

Chi-Square Data Analysis

Chi-square formula:

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

X^2 is the value for chi-square.

Σ is the sum.

O is the observed frequency.

E is the expected frequency.

FIGURE 2

Calculation of Research Data – Chi-Square

Data was collected from four graduated classes of Respiratory Therapy Technology students at Central Virginia Community College. The data collection produced these results:

	GPA 2.0-2.49	GPA 2.5 or greater
Graduated	8 B	30 A
Did not graduate	6 D	5 C

$p < .05 = 0.030339$ – software calculation

Chi-square Distribution Table: Critical value is to the right of $p < 0.05$.

SUMMARY

Chapter IV contains data analysis using a chi-square test to determine if there was a direct correlation between students' GPA and graduation from CVCC's Respiratory Therapy Technology Program. The results of the data analysis using the chi-square test found there was a correlation between entrance GPA and successful graduation. Chapter V summarizes the content for the research conducted in this study. It will contain the conclusions and recommendations for this research.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The problem of this research study was to determine the relationship between Central Virginia Community College (CVCC) Respiratory Therapy Technology Program students entrance GPA and their graduation success to determine if minimum entrance GPA should be increased from 2.0 to 2.5. Chapter V provides a summary of the research study, draws inferences founded on the data analysis, and renders recommendations based upon the conclusions.

SUMMARY

College admissions have long used GPA and standardized test scores to assess academic success. According to Warne, Nagaishi, Slade, Hermesmeyer, and Peck (2014), "HSGPA carries more weight than any other factor in the college admissions process. GPA and class rank are two of the four most important criteria to consider when deciding whether a student will be admitted to college" (p. 262). It begs to question whether GPA is an accurate method to determine an applicant's abilities and potential. The long standing usage of GPA as an important criteria to gain admission to a university seems to imply that it can be tied to academic success as well as being a reliable assessment tool.

The use of grade point averages has been linked to assessing past academic success and future academic success in four-year educational institutions. However, literature that supports the use of GPA with future academic success in a community college and specifically allied health programs is practically non-existent. Traditional college students still account for the majority of college students, but community colleges have a large number of non-traditional students that continues to increase. Wladis,

Hachey, and Conway (2015) define non-traditional students as "delayed enrollment, no high school diploma, part-time enrollment, financially independent, have dependents, single-parent status, and working full-time" (p. 2). The majority of students that apply for admission into CVCC's Respiratory Therapy Program are non-traditional students. The student population is diverse with goals of obtaining an education in a limited time frame that will allow them to provide for their families.

Selecting students for CVCC's Respiratory Therapy Technology Program is an ominous task. The success of students in the program is tied to the accreditation status of CVCC's Respiratory Therapy Technology Program. For this reason, it is imperative to utilize tools that may help in student selection. Future research needs to focus on these non-traditional students who have a desire to work in the medical profession. The lack of literature that delves into community college selective programs and admission criteria supports the need for this quasi-experiment.

The problem of this study was to determine the relationship between Central Virginia Community College (CVCC) Respiratory Therapy Technology Program student's entrance GPA and their graduation success to determine if minimum entrance GPA should be increased from 2.0 to 2.5. To solve this problem the following hypothesis was established:

H_1: There is a direct correlation between students' GPA and respiratory therapy graduation success.

Research that examines the relationship between GPA and academic success in an associate or bachelor degree respiratory therapy program is lacking. The lack of research clearly presents significant reasoning behind this study.

The limitations of the study were as follows:

1. The results of the study were confined to the Central Virginia Community College Respiratory Therapy Technology Program.

2. The admission grade point average of 49 CVCC Respiratory Therapy Technology Program students was used.

3. The grade point averages utilized in the data collection were from four cohorts starting in August 2010, 2011, 2012, and 2013.

The population consisted of students admitted into CVCC's Respiratory Therapy Technology Program. The students were separated into four cohorts. The first group started with 13 students in August 2010 and 10 successfully graduated in May 2012. The second group started with 13 students in August 2011 and 11 successfully graduated in May 2013. The third group started with 9 students in August 2012 and 7 students successfully graduated in May 2014. The fourth group started with 14 students in August 2013 and 9 students successfully graduated in May 2015. Students who withdrew from the program for personal reasons were eliminated from this study.

The first data set used in this study was entrance GPA's of all students accepted into CVCC's Respiratory Therapy Technology Program in August 2010, 2011, 2012, and 2013. The second data set was a list of all students that graduated in 2012, 2013, 2014, and 2015. Data were collected from the student files held by CVCC's Respiratory Therapy Technology Program Head. The researcher compiled the information based on entrance year and then separated the students into three sub-groups: those who graduated, those who did not graduate because of personal reasons, and those who did not graduated

because of academics. Students who did not graduate because of personal reasons were eliminated from the study.

After all data were collected, the researcher compared admission cumulative GPA to those who graduated or did not graduate because of poor academic performance. Graduates of the Respiratory Therapy Technology Program were separated into two categories: Graduates with an entrance GPA 2.0 – 2.49 and graduates with an entrance GPA 2.50 and higher. Student names and other personal information was not used, instead students were referred to as a number. The chi-square test was used to analyze collected data. A comparison was used to determine if entrance GPA was a determining factor as to whether a student would successfully graduate from the program.

CONCLUSIONS

The purpose of this study was to determine the relationship between Central Virginia Community College (CVCC) Respiratory Therapy Technology Program student's entrance GPA and their graduation success to determine if minimum entrance GPA should be increased from 2.0 to 2.5. A hypothesis was formed after reviewing literature and reviewing data obtained from student records. The following hypothesis was formed:

H_1: There is a direct correlation between students' GPA and respiratory therapy graduation success.

The data analysis concluded that there is a significant difference between CVCC's Respiratory Therapy Technology Program students' entrance GPA and graduation success. The chi-square test result was $X^2 = 4.689$ and the $p < 0.05$ value is 0.0303. The $df = (2-1)(2-1) = 1$, $p < .05 = 0.030339$ obtained was from software calculation and the

Chi-square Distribution Table reported at the right of $p < 0.05$. The results of the chi-square test support the hypothesis; therefore, the hypothesis was accepted. There were fourteen students in the 2.0-2.49 GPA group and thirty-five students in the 2.5 or greater GPA group. The average GPA for the 2.0-2.49 group was 2.218 and the average GPA for 2.5 or greater group was 3.276. The four cohorts used entered the respiratory therapy program in 2010, 2011, 2012, and 2013 and graduated in 2012, 2013, 2014, and 2015. The significance of the data analysis results support the premise that CVCC's Respiratory Therapy Technology Program's entrance GPA should be increased from 2.0 to 2.5. Increasing the entrance GPA would upsurge the over-all success of incoming students.

RECOMMENDATIONS

The researcher found that many applicants did not know the program existed or anything about the respiratory therapy profession. The limited application pool of viable candidates was a direct result of poor marketing. The researcher found this was a hindrance to raising the GPA requirements to 2.5 without supportive data. Data results will be presented to CVCC's Respiratory Therapy Technology Program Advisory Board and college administration to request approval to increase the entrance GPA from 2.0 to 2.5. The results of the research should support the request to increase CVCC's Respiratory Therapy Technology Program entrance GPA. The change of entrance GPA will assist in obtaining quality candidates with an improved possibility of graduation success.

A marketing strategy should be formed to increase awareness of CVCC's Respiratory Therapy Technology Program and respiratory therapy as a profession. The marketing campaign could include an open house for high school guidance counselors as

well as students, CVCC's faculty and counseling department. Media is another form of marketing that could be worthwhile, such as a television commercial or local program appearance. The use of social media, such as Facebook and Twitter, could also provide a format to educate the public of the respiratory therapy professions. These marketing strategies could be used to promote the program and profession to improve the application pool with higher caliber students.

The counseling department at CVCC should receive training about the Respiratory Therapy Technology Program and the profession. A standardized procedure should be developed for counselors to follow when new and current CVCC students seek advice on a career. Potential students should be informed of admission requirements as well as career opportunities as a respiratory therapist. CVCC's Respiratory Therapy Technology Program earns graduates the ability to sit for national boards and obtain a state license to practice. Graduates are also afforded the opportunity to seek a higher education at the University of Virginia (UVA), which has an agreement with CVCC's Respiratory Therapy Technology Program. The agreement guarantees admission into UVA's leadership program as long as the student meets academic requirements. Educating the counseling department will reduce the time counselors spend writing a referral to CVCC's Respiratory Therapy Technology Program Head for students who do not meet admission requirements.

The researcher should continue to collect data with future cohorts to determine if increasing the entrance GPA of 2.5 or greater is related to graduation success. The importance of evaluating entrance GPA to graduation success can be tied directly to accreditation requirements for the respiratory therapy program. The accreditation agency

limits attrition to 40%, which makes obtaining quality candidates for admission a high priority. The researcher may also want to collect data that compares entrance GPA to exit GPA of all graduates. This information would solidify the importance of GPA and college success. This study could be used and replicated by any allied health program offered at higher education institutions to correlate entrance GPA and successful graduation.

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APPENDIX

APPENDIX A – CHI-SQUARE DISTRIBUTION TABLE

TABLE IV							
Chi-Square (χ^2) Distribution							
Area to the Right of Critical Value							
Degrees of Freedom	0.99	0.975	0.95	0.90	0.10	0.05	0.025	0.01
1	—	0.001	0.004	0.016	2.706	3.841	5.024	6.635
2	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210
3	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345
4	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277
5	0.554	0.831	1.145	1.610	9.236	11.071	12.833	15.086
6	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812
7	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475
8	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090
9	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666
10	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209
11	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725
12	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217
13	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688
14	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141
15	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578
16	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000
17	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409
18	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805
19	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191
20	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566
21	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932
22	9.542	10.982	12.338	14.042	30.813	33.924	36.781	40.289
23	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638
24	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980
25	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314
26	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642
27	12.879	14.573	16.151	18.114	36.741	40.113	43.194	46.963
28	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278
29	14.257	16.047	17.708	19.768	39.087	42.557	45.722	49.588
30	14.954	16.791	18.493	20.599	40.256	43.773	46.979	50.892