

EFFECTS OF ADMISSION STANDARDS ON BAKERSFIELD COLLEGE PARAMEDIC
SCHOOL ATTRITION RATES

By

Charles Elkin Brown

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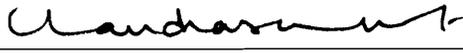
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Chandrasekhar Commuri, Ph.D.

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Date


R. Steven Daniels, Ph.D.

6-1-2009
Date

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Abstract

This study presents both a descriptive and statistical analysis of the relationship between paramedic school admission standards and student attrition rates. The results of this study will be used by the Bakersfield College paramedic school to implement changes to their current admission requirements in an attempt to reduce student attrition. Data was collected from 18 of the 28 accredited paramedic schools in the state of California. A descriptive analysis of the data revealed that paramedic programs with strict admission standards had significantly lower student attrition rates than programs with more relaxed admission standards. Based on the findings of this study, it is recommended that Bakersfield College increase the paramedic school admission standards to include an oral interview, work experience, and successful completion of the HOBET exam.

CHAPTER ONE

INTRODUCTION

Overview

Prior to the 1960s, pre-hospital emergency care in the United States consisted of little more than poorly trained technicians employed to transport sick or injured patients to local hospitals. In 1966, the National Academy of Sciences released a report entitled *Accidental Death and Disability: The Neglected Disease of Modern Society*. This report revealed for the first time that, “One of the serious problems today for both the lay and the professional areas of responsibility for emergency care is the broad gap between {emergency medical} knowledge and its application. Expert consultants returning from both Korea and Vietnam have publicly asserted that, if seriously wounded, their chances of survival would be better in the zone of combat than on the average city street” (NAS, 1966 pg. 12). This report noted that critically injured soldiers were receiving special emergency care by corpsmen that were skilled in fluid replacement therapy and trauma management. These corpsmen were trained to delay mortality on the battlefield until the patient could arrive at a hospital and receive definitive care. These corpsmen were the early predecessors to modern-day civilian paramedics.

The 1970s saw the evolution and growth of the paramedic profession in the United States. At the time the hit television show *Emergency!* introduced paramedics Johnny and Roy to the United States, there were only six paramedic units operating within the U.S. At the end of the decade, however, nearly every state in the union had some form of paramedic system. Emergency responders had finally realized the importance of deploying highly trained pre-hospital care providers to assist the sick and injured. Paramedics had started to become an extremely important component of the medical care system in the United States.

Today, paramedics are well-educated, highly skilled pre-hospital care providers. They receive training in emergency cardiology, electrocardiograph (ECG) interpretation, Intravenous (IV) cannulation, pharmacology, medication administration, airway management, and many other life-saving skills. “Through performance of assessments and providing medical care, the goal of a paramedic is to prevent and reduce mortality and morbidity due to illness and injury” (CAAHEP, 2005). Paramedics typically work closely with police and fire departments and respond to both medical emergencies and acute traumatic injuries.

Currently, local community colleges remain the most common setting for paramedic education in the U.S., although many private paramedic programs do exist. Each paramedic program is able to set its own admission requirements, but it must provide paramedic training according to a specific standard. The National Highway Traffic Safety Administration (NHTSA, 1998) has developed a National Standard Curriculum for paramedic education, which must be taught by every paramedic program in the U.S.

Bakersfield College (BC) paramedic program is one of these community college programs. Opened in 2002, BC has been in existence for nearly seven years and approximately 140 paramedics have graduated from the program. The program is currently in the process of training the eleventh paramedic class. On average, 24 students begin each class. The program is an accredited, non-degree granting vocational program. Successful completion of the program qualifies students for licensure testing with the National Registry of Emergency Medical Technicians (EMT) as an EMT-Paramedic in the state of California.

All paramedic training programs are divided into three phases: didactic, clinical and field training. The BC program is comprised of no less than 1,090 hours of intensive training

including 450 didactic hours, 160 clinical hours, and 480 field-training hours. During the didactic phase, lectures, presentations, and skills workshops are utilized to develop each student's cognitive abilities. In the clinical phase, students are rotated through hospital clinical sites, function under direct supervision of a nurse or physician while rendering approved medical treatment to patients, and develop their psychomotor skills through manipulate skills. During the field internship phase, each student is assigned to a Bakersfield College-approved paramedic preceptor. While in this rotation, the student will perform within the scope of practice of Kern County EMT-Paramedics, under the direct supervision of a licensed EMT- Paramedic ("BC Allied Health," n.d.)

Background of Problem

The BC paramedic program focuses on providing the highest quality education for its paramedic students. The National Highway Traffic Safety Administration (NHTSA), the governing body for U.S. paramedic education, mandates that the staff will teach a national curriculum to every paramedic class. The staff works meticulously to organize, prepare, and deliver lectures and skills workshops throughout the program that meets the national standard.

All paramedic students face an extraordinarily steep learning curve during the each phase of paramedic training. Some liken a nine-month paramedic program to a condensed two-year nursing program. Students are continuously inundated with enormously difficult medical information including medical terminology, anatomy, physiology, cardiology, electrocardiograph (ECG) interpretation, and pharmacology among many other topics. The mind-numbing speed of paramedic school requires each student to possess a steadfast determination to master the material in a very short time frame.

Often, the student who has prepared him- or herself best prior to beginning paramedic school is the most successful. Work experience and formal education are two ways that a potential student can better prepare for the rigors of paramedic school. Previous work experience as an EMT prior to attending paramedic school can enhance the student's ability to recognize and perform well in emergencies. Completing classes such as anatomy, physiology, ECG interpretation, and so on, can prepare an individual by introducing them to subjects that they will ultimately have to master in paramedic school.

Some paramedic schools require that an applicant can demonstrate EMT work experience, successfully complete numerous written entrance-exams, and undergo an oral interview prior to being accepted into their program. These strict standards are designed to eliminate from the process any potential student who is not adequately prepared to meet the demands of the paramedic program.

The BC paramedic program, however, does not enforce such strict standards for their applicants. Each BC applicant must simply have graduated high school (or possess a general equivalence diploma [GED]), pass a 200-question EMT exam, and have a valid Emergency Medical Technician certificate. There currently exists no additional educational or work requirement in order to gain entry into the program.

Statement of Problem

Like many paramedic schools, BC struggles with student retention. BC instructors have noted that many students lack basic emergency medical knowledge, which makes learning new material at a fast pace difficult (Christine Harker, Personal communication, February 12, 2009). Other students have little or no work experience in the emergency medical setting prior to entering paramedic school and have exhibited below-average basic

life support (BLS) skills (a necessary foundation to build more advanced paramedic knowledge). It is no wonder that with under-prepared students entering the program, the school has experienced high attrition rates.

High attrition is the problem facing the BC paramedic school. In the first five years of its existence, the program has seen exceptionally high attrition rates in each phase of paramedic training. Each class starts with an average of 24 students and ends with an average of 16 students. This results in a total attrition rate of roughly 31 percent throughout the program's history.

For the purpose of this study, attrition is defined as, any student who begins, but does not complete, the necessary paramedic training by their initial, intended graduation date, for any reason. As will be seen, students can fail or drop out of a program for many reasons. Students will face many difficulties throughout a program including academic, financial, or affective challenges that may force them to fail or drop.

The BC paramedic school administrators are seeking ways in which to reduce the attrition rate of their paramedic students. Admission standards are just one variable that BC administrators are investigating as a potential contributor to high attrition rates. BC admission standards are relatively minimal compared to other paramedic programs in the state of California. This study seeks to examine the effects of admission standards on attrition rates in order to determine if BC should require stricter admission standards for future paramedic students.

If stricter admission standards were to be implemented, then only the best-prepared students will have an opportunity to apply. It is reasonable to assume that the applicants who meet the stricter admission standards will have a greater chance at successfully completing

paramedic school. Students, paramedic programs, and employers will ultimately benefit from the higher success rates created by the stricter standards.

Failure from a paramedic program has huge fiscal implications for the student. The average cost of a paramedic program in California is \$5,298, and it is often non-refundable after failing or dropping out of school. Due to the amount of study time required to be successful, students usually have to eliminate or significantly reduce work hours while enrolled in a paramedic program.

Approximately 30 percent of the students who attend BC paramedic school move to Kern County from Los Angeles County and rent apartments for the 6-month didactic phase of the program (Christine Harker, Personal communication, February 12, 2009). Students incur additional living expenses such as food, rent, and transportation to and from their home to visit family and friends. All of these expenses are obviously non-refundable after failing from a paramedic program. If, however, a student completes the program, then, one could argue, they made an excellent investment in their future.

Possible Results of Stricter Admission Standards

If BC chose to implement stricter admission standards, at least two distinct impacts could arise. First, the imposition of more rigorous standards could potentially limit the pool of applicants. Initially, fewer applicants would be able meet the stringent requirements, potentially leading to a decrease in overall class size. Smaller class size would negatively affect program revenue due to the decrease in student enrollment. Conversely, however, schools who offer the courses that are required for admission into their program could see an increase in the number of students enrolling in the required courses. Funds collected from the

increased enrollment in these classes could potentially offset the revenue lost from the smaller class sizes in the paramedic school.

Another possible impact of increasing admission requirements is that low paramedic school attrition rates can make a school more attractive to students seeking a paramedic education. The idea is that a program with high student success rates is highly desirable. A desirable program can lead to competition for seats in a program and ultimately lead to many qualified applicants. With highly qualified candidates applying to the BC program, administrators could expect to see a reduction in student attrition rates.

A change in admission standards will also impact employers in a number of ways. Currently, BC applicants must only maintain a valid EMT certificate to apply. Actual EMT work experience is not required for acceptance. As previously stated, the basic life support (BLS) skills and other important psychomotor skills acquired through EMT work experience are incredibly important in developing more advanced paramedic knowledge. Future applicants would not only have a greater motivation to work for ambulance companies, but they would also develop valuable skills necessary for success in paramedic school. If BC were to require prior EMT work experience in their new admission standards, then many ambulance companies, and other employers of EMTs, could see an increase in the number of applicants.

Another important aspect of additional paramedic graduates is their impact on the California workforce. Assuming implementing stricter admission standards would lead to higher graduation rates, we could reasonably posit that there would be more paramedics seeking employment. California has recently seen a dramatic shortage of qualified

paramedics in the workforce, and additional graduates would shrink the scarcity of highly qualified paramedics in the state.

Over the last decade, most fire departments across the state have changed their mission to include higher-level emergency medical care service for their communities. “Fire engines typically arrive at emergency scenes before ambulances, so it makes sense to have firefighters trained as paramedics so that emergency medical care can begin sooner” (Gordon, 2007). This shift in fire department duties from EMT-level care to paramedic-level care has created a significant paramedic shortage throughout California.

Some fire departments are finding it extremely difficult to recruit qualified paramedics. Dr. Chris Nollete, Director of emergency medical services programs at Riverside Community College, stated in a 2007 interview "Everyone's heard there's a nurse shortage, but there's also a paramedic shortage, not only in California, but across the country" (Gordon, 2007). In 2007, Riverside fire department tested 500 applicants for just 15 firefighter positions. Later that same year, only 85 applicants tested for the same number of firefighter/paramedic positions. This underscores the fact that there are few qualified paramedics available to employers. With so many employers seeking paramedics, it seems imperative that schools consider ways to increase the number of qualified paramedic school graduates.

Methods and Procedures

The purpose of this study is to determine if stricter admission requirements for BC would have an effect on attrition rates. In order to understand the overall impact, however, the evaluator sought to answer the following questions: How do admission requirements vary between paramedic programs in California? How do the BC paramedic program attrition rates compare with other paramedic schools in the state? How do the BC paramedic program

admission standards compare with other paramedic schools in the state? Do stricter admission requirements have an effect on attrition rates?

Unfortunately, not all admission standards are the same. Some schools require applicants' to complete specific classes prior to submitting an application and others do not. Due to the rapid pace of paramedic training, students who have a general idea of the topics taught before attending school often perform better than those who are introduced to those same topics during the paramedic training. Therefore, many schools have implemented strict admission requirements in order for students to gain acceptance into their program. These stricter requirements are meant to eliminate students who are underprepared and who would otherwise have a higher likelihood of failing out of school.

In the state of California, there are 28 nationally accredited paramedic programs. The Committee for Accreditation of Emergency Medical Services Professions (CoAEMSP) is the accrediting body, and each school must annually meet specific standards in order to maintain their accreditation. Each of the 28 programs will be contacted via e-mail with a request for information. Each school will be asked to furnish data on student attrition rates for the didactic and internship phases of paramedic training over the last five-years. No identifiable student information will be requested, and none should be furnished by the participating schools. Upon receipt of the data, the average attrition rates for each school will be compared with the data of the other participating programs.

Next, the admission standards of the participating programs will be categorized, placed in one of three sub-sections (cognitive, psychomotor, or affective), assigned a point value, and each program will be ranked based on their total point score. In addition to requesting admission standards information from each school, all of the minimum application

standards for each program is posted on the school's website. A statistical analysis (t-test) will also be completed to determine a correlation exists between admission standards and attrition rates.

Goals and Objectives

The goal of this study is to decrease the average attrition rate for BC students during all phases of paramedic training. By implementing stricter admission standards, BC can begin to reach this goal. While *zero* percent attrition for the program would be ideal, the fact that many students can face financial, family, or learning difficulties at some point during the program makes this goal unlikely. Some circumstances that lead to student attrition rates are simply beyond the control of either the students or the BC administrators.

The goal of reducing attrition rates can be accomplished by

- Requiring completion of various advanced medical training courses
- Requiring successful completion of the Health Occupations Basic Entrance Test (HOBET)
- Requiring successful completion of an oral interview
- Requiring at least six months of EMT field (work) experience

In the following chapter, we will discuss the importance of focusing on the three learning domains identified in the National Standard Curriculum for EMT-paramedic education, and determine ways in which BC paramedic school can address those learning domains within the admission process.

CHAPTER TWO

EMERGENCY SERVICES PEDAGOGY

This chapter discusses the logic behind implementing stricter admission standards at BC paramedic school, identifies major stakeholders, explains the measure of effectiveness, determines the goals and objectives of the proposal, and outlines potential solutions.

Emergency Services Pedagogy

In 1998, the National Highway Traffic Safety Administration (NHTSA) released a revised edition of the 1985 National Standard Curriculum for EMT-Paramedic education. “The curriculum is specifically designed to address the educational needs of the traditional paramedic. It is designed to provide a solid foundation for professional practice and additional education with an emphasis on clinical problems solving and decision making” (NHTSA, 1998). Each component of the NHTSA EMT-paramedic curriculum is intended to address each of the three learning domains identified in 1956 by Benjamin Bloom (Bloom, 1956). In order to complete paramedic training, each student must demonstrate competency in all areas of the Cognitive, Psychomotor and Affective learning domains.

Cognitive Domain

The cognitive domain of learning “includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills” (Bloom, 1956). Every paramedic student must display a thorough understanding of paramedic knowledge through the “use of quizzes, regular topical exams, and some combination of comprehensive exams (midterms and finals)” (NHTSA, 1998). Students can further demonstrate their cognitive knowledge through oral reports, direct questioning, or discussions on medical information.

Cognitive learning begins during the didactic phase of paramedic training. Each student must master the “textbook” knowledge of paramedic education before moving on to the clinical and field internship phases of training. The rapid pace of didactic instruction can be extremely difficult for the underprepared student. Proficiency in math, reading, and writing prior to attending paramedic school may help to increase student success rates during didactic training.

Psychomotor Domain

Psychomotor skills are learned throughout paramedic training. Skills such as airway management, Intra-venous (IV) cannulation, and medication administration among others are taught during labs, clinical rotations and field internship, and they must be mastered prior to completing paramedic training. The psychomotor domain includes “...physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution” (Simpson, 1972).

EMTs wishing to apply to a paramedic school can increase their psychomotor skills through work experience. Work experience allows an EMT to develop some of the abilities that are the foundation for many paramedic skills. It is, therefore, extremely important for any paramedic school applicant to have some work experience prior to attending school.

EMTs can also increase their psychomotor skills by completing courses designed specifically to provide students with the opportunity to practice certain hands-on skills. Courses such as Paramedic Preparation, Pre-hospital Trauma Life Support (PHTLS), and Advanced Cardiac Life Support (ACLS) among others offer students the chance to work on psychomotor skills as well as cognitive learning.

Affective Domain

The affective domain can be measured throughout every step of paramedic training. Subjective measures including appearance, attitude, and motivation to study and learn are all gauges of affective domain. The affective domain "...deals with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes" (Krathwohl, Bloom & Masia, 1973). It can be extremely important for students to maintain a positive attitude throughout paramedic training. Each school should seek out motivated students, and oral interview's can be designed to allow programs to select students based on their enthusiasm for learning and positive attitudes.

Definition of the Problem

Bakersfield College paramedic program has too many students not completing paramedic training. On average, 31 percent of the paramedic students who begin the BC program are not successful. Although many reasons exist for why students fail or voluntarily drop the program, stricter admission standards would help to eliminate from the admission process those students who are under-prepared for paramedic training.

Currently, to gain acceptance into the BC program, applicants must possess a valid driver's license, a valid Emergency Medical Technician certificate and successfully complete a 200-question multiple-choice EMT exam. These are relatively minimal requirements compared to various other paramedic programs with higher student retention rates.

Consider, for example, one paramedic school in Los Angeles, California that was recently ranked as one of the top ten best schools for paramedic education in the country. This particular program has maintained an average of just over seven percent total attrition over the last five years. While competition to gain acceptance into this program is intense and

admission standards are rigorous, this program is required to teach to their students the same paramedic curricula as every other paramedic program in the country. Because the NHTSA requires that the information remain constant throughout every paramedic program, it is disheartening to see the 31 percent attrition rates at BC when another school maintains considerably lower attrition rates.

Major Stakeholders

If BC paramedic program were to implement stricter admission standards, many stakeholders would be affected. Stakeholders are “individuals, groups, or organizations that have a significant interest in how well a program functions” (Rossi, et al., 2004, p. 18). In this case, all future BC paramedic school applicants will be the primary stakeholders. All proposed admission standards are designed to reinforce the cognitive, psychomotor, and affective requirements of paramedic education. Therefore, any applicant meeting the newly implemented standards will have proven their ability to apply themselves during the didactic (cognitive) and clinical and field internship (psychomotor) phases of training.

Bakersfield College Nursing & Allied Health department (Allied Health) is a major stakeholder as well. Because the BC paramedic school is under the umbrella of Allied Health, any change made to the paramedic program will affect the entire department.

Initially, stricter admission standards could reduce the number of qualified applicants. This, in turn, can decrease the number of eligible students available to begin each class. Fewer students in each class can lead to a reduction in paramedic school revenue, which has an affect on the overall department budget. On the other hand, if BC were to offer the courses required for admission into the paramedic program, then the revenue from these courses would offset any potential losses from the smaller paramedic class size. In the long-term, as

more students begin to meet the new admission criteria, these new courses could serve as an additional revenue stream for the department.

Additional stakeholders affected by this proposal are the Bakersfield College paramedic school instructors, and all employers of paramedics.

Potential Solutions

Health Occupations Basic Entrance Test (HOBET) (COGNITIVE DOMAIN)

The HOBET is a multiple-choice exam designed to test the general knowledge and aptitudes of a student. This test is designed to test the cognitive abilities of each applicant. The following is a list of the areas measured by the HOBET: Essential Math Skills, Reading Comprehension for Science Textbooks, Reading Rate, Critical Thinking Appraisal, Test-taking Skills, Stress Levels, Social Interaction Profile, Learning styles and Overall Composite Score. “This test will not only identify weaknesses in processing skills which are necessary for success in college, but it will enable each student to correct their weaknesses prior to entering school” (HOBET 2009).

Many health-care related programs, such as nursing or paramedic programs, use the HOBET exam. Educators need to know that a person has the minimum qualifications necessary to study and do well in their program. “It does not help anyone involved to accept applicants who are not qualified to handle the work or study. To avoid lots of wasted time and disappointment, these educators and employers now use HOBET to screen potential candidates” (HOBET 2009).

Requiring students to pass this exam will give the BC staff a good idea of what style of learner an applicant will be, and it can provide the student with an idea of their cognitive strengths and weaknesses.

Work Experience (PSYCHOMOTOR DOMAIN)

Currently, BC does not require applicants to have any prior Emergency Medical Technician (EMT) work experience. BC requires only that an applicant have a valid EMT certification. This means that, theoretically, as soon as an individual completes a 3-month EMT course, they can directly apply for admission into the paramedic program. Because paramedic education builds on the more rudimentary knowledge of the EMT, it is imperative that an EMT be proficient with basic life support knowledge and skills prior to beginning paramedic school. The psychomotor skills required to successfully complete paramedic school can be introduced and reinforced through EMT work experience.

Only through work experience can “...an EMT acquire applied knowledge of the causes and consequences of traumatic injuries and acute illnesses, and develop skills for diagnosing and treating such medical conditions in the pre-hospital setting” (Chandler, 2007). Requiring applicants to have a minimum of one year of EMT field experience can help to ensure that incoming paramedic students have a solid foundation of knowledge, skills, and abilities prior to beginning the BC program.

Oral Interview (AFFECTIVE DOMAIN)

In the field of emergency medicine, it is extremely important for a practitioner to communicate clearly and confidently in stressful situations. This is one reason that some paramedic programs require applicants to pass an oral interview as part of the admission process. During an oral interview, applicants are asked standardized questions designed to evaluate verbal communication skills, attitude, life experience, emergency service experience, current financial situation, motivation, enthusiasm, and maturity. All of these topics provide the interviewers with vital clues as to the individuals’ level of preparation for

paramedic school. Requiring an oral interview for future students can be an important step towards eliminating those applicants who cannot show that they have the level of dedication needed to be successful in paramedic training.

Recommended Coursework (COGNITIVE/ PSYCHOMOTOR DOMAIN)

Everything in medicine builds from anatomy and physiology. Therefore, if a student is required to have taken these courses prior to attending a paramedic program, then they will already be familiar with the subject when it is introduced in paramedic school, and they should perform better on tests and retain the information much easier.

Both the National Highway Traffic Safety Administration (NHTSA) and California Code of Regulations (CCR) Title 22 have established standards for paramedic training. Every paramedic school is required to teach very specific subjects including anatomy, physiology, cardiology, pharmacology, electrocardiograph interpretation, medical mathematics, medical terminology, medical and trauma patient care, among other topics. The problem for many paramedic students, however, is that much of the medical information is extremely difficult to master in the four-month didactic phase of paramedic training. Many students have problems learning at such a rapid pace. This is why some schools recommend that applicants complete certain courses prior to entering paramedic school.

Many paramedic programs have incorporated into their curriculum courses such as Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), and Pre-Hospital Trauma Life Support (PHTLS). ACLS and PALS were developed by the American Heart Association (AHA) and are offered to any medical practitioner including nurses, doctors, paramedics, and EMTs. PHTLS was developed by the National Association of

Emergency Medical Technicians in cooperation with the American College of Surgeons Committee on Trauma and is available to any emergency medical practitioner.

Many community colleges also offer other medical-related courses including ECG interpretation, pharmacology, and phlebotomy, among others. Each of these courses can provide an EMT with invaluable, paramedic-level information, and they can be completed prior to attending paramedic school. Not only will these courses better prepare the future paramedic student, but their completion also demonstrates that an applicant has taken the initiative to learn on their own. Paramedic schools should encourage EMTs to complete as many emergency-based medical classes as possible prior to attending a paramedic-training program.

CHAPTER THREE

METHODOLOGY

Survey Design

In an attempt to reduce paramedic school attrition, it may be necessary to implement admission standards that directly relate to the three learning domains (cognitive, psychomotor, and affective) identified by Benjamin Bloom (Bloom, 1956.) For this study, each school was asked to provide the following information: didactic attrition data for each class over the last 5 years, clinical and field internship attrition data for each class over the last 5 years, the average number of applications received for each class, the average class size, and the program admission standards.

The attrition information was used to determine the point at which students were exiting the program. Student attrition rates were separated into two categories: attrition during didactic, or cognitive, training and attrition during the clinical and field internship, or psychomotor, phase of training. Although the clinical and field internship are two distinct phases of paramedic training, the attrition information for both were combined because the purpose of each phase is to develop the psychomotor skills learned in the cognitive domain of the classroom. Understanding attrition rates for didactic, clinical and field internship becomes important when trying to determine if the students are leaving due to academic or other reasons.

Ultimately, if a program's admission standards do not require an applicant to demonstrate proficiency in cognitive, affective, and psychomotor skills, then under-prepared students are more likely to be accepted into a program and eventually drop out. Therefore,

the point at which the student exits the program becomes extremely important when considering admission standards.

Each program's admission standards were analyzed to determine how strongly each standard related to the three learning domains identified in the NHTSA National Standard Curriculum for EMT-paramedic education. For example, if a school required passing scores in Math and English, these requirements would be considered positive cognitive domain requirements. Further, if a school required an oral interview, this would be considered a positive affective domain requirement because evaluators are attempting to measure an applicant's desire and motivation. Lastly, if a school required a specific amount of EMT field experience, then this would be considered a positive psychomotor domain requirement.

The number of applications received by a program is important because it directly relates to a school's ability to absorb a potentially negative economic impact due to implementing stricter admission standards. If a program has many more applicants than it has openings in a class, then the program will have a high applicant-to-student ratio, and stricter admission standards would have a minimal impact on the program's ability to place students in a class. This would minimize the financial burden on a program. If a program with a low applicant-to-student ratio were to implement stricter admission standards, then the program's ability to fill a class with qualified students could be reduced. This could have a negative financial impact on the school.

Sample Selection

California Emergency Medical Services Agency (Cal EMSA) website lists 31 active paramedic programs in the state and 28 of these maintain national accreditation through the Committee for Accreditation of Emergency Medical Services Profession (CoAEMSP). These

28 accredited schools were chosen to be included in the study because of the rigorous standards that must meet in order to preserve their accreditation. Although the CoAEMSP website provides information on accredited programs throughout the United States, only California accredited schools were surveyed.

Importance of Accreditation

The Commission on Accreditation for Allied Health Education Programs (CAAHEP) is the national accrediting body for all health professions including the American Academy of Pediatrics (AAP), American College of Emergency Physicians (ACEP), National Association of EMTs (NAEMT), and the National Registry of EMTs (NREMT) among many others (CoAEMSP, n.d.). Over the last decade, many organizations have called for “a single national EMS accrediting agency to be part of a process of standardization in EMS education” (CoAEMSP n.d.). Working closely with the CAAHEP, CoAEMSP has developed an accreditation process designed to meet the needs of the EMS education community, and it remains the only accrediting body for the EMS profession.

Any program seeking accreditation must complete a rigorous review process. Generally, the accreditation process takes anywhere from 6-12 months to complete depending on the amount of time and energy the program director puts into the process. According to the CoAEMSP website, “The accreditation process promotes continual self analysis designed to make the program, its graduates, and ultimately, the care they deliver to the public, BETTER. It supports a philosophy of on-going improvements within your program to ensure the highest quality education for EMS professionals” (CoAEMSP, n.d.).

In the last few years, the EMS community has recognized the importance of program accreditation. The National Registry of EMTs has indicated that as of January 2013 only

graduates from accredited paramedic schools will be eligible to test for licensure in their state. The NREMT is the largest licensing organization in the United States, which reinforces the significance of their decision to allow only students from accredited schools to test for paramedic licensing.

Because the accreditation process is such a critical aspect of EMS education, only accredited paramedic programs were chosen for inclusion into this study.

Limitations and Delimitations

Perhaps the greatest limitation of this study is the impossibility of quantifying an individual student's motivation. Although attrition rates and admission standards are objective variables that can easily be measured, the subjective variable of motivation cannot be measured. To be sure, many students have successfully completed paramedic training without first exhibiting mastery of the cognitive and psychomotor skills necessary for success in paramedic school. Conversely, many students who have college degrees and vast EMS work experience have failed or dropped out of paramedic school for various reasons. While it may be possible to develop ways to mitigate future attrition, an individual student's motivation to succeed will remain an elusive variable.

Another key limitation of many studies is that the results generally affect only the group, organization, or program that is being considered. That is not so with the results of this study. A significant advantage of this study is that the results can apply to all paramedic programs throughout the United States. Although only California programs were included in this study, the NHTSA's National Standard Curriculum for EMT-paramedic education and the CoAEMSP accreditation process ensure that EMT-paramedic education remains constant across the nation. In addition to the uniformity of knowledge and skills learned by paramedic

students, the cognitive, affective, and psychomotor demands on a paramedic student in California will closely mirror the demands placed on paramedic students elsewhere in the country.

Institutional Review Board Process

Prior to requesting information from the 28 California paramedic programs identified in this study, the evaluator was required to complete the Institutional Review Board (IRB) testing and review process. “The Code of Federal Regulations: Title 45, Public Welfare, Part 46, Protection of Human Subjects, specifies that human subjects research may not begin until it has been authorized by the university IRB” (CSUB, GRASP n.d.).

Each evaluator begins the IRB process by completing a self-paced tutorial that covers subjects such as informed consent, risk to benefit analysis, overview of the IRB process, and the ethical principles of respect, beneficence, and justice. After completion of the tutorial, each evaluator must pass a 50 question multiple-choice exam covering the concepts from the readings. The exam is then forwarded to the Grants, Research and Sponsored Programs (GRASP) department at California State University, Bakersfield (CSUB) for grading and verification of the evaluator’s competence to complete Human Subjects Research (HSR). This evaluator completed the IRB/ HSR testing in April 2008, and is certified in Human Subjects Protection Training.

In addition to the above mentioned testing process, each HSR project at CSUB “...must first be reviewed and then authorized by the CSUB IRB/HSR to ensure that the project contains the necessary elements so that when carried out, the persons serving as human subjects will be treated ethically” (CSUB, GRASP n.d.). In this case, the study was submitted for approval for Exemption from Full Review by IRB/HSR. This study falls under

research category 4 of CFR Title 45, Part 46, Section 46.101, which grants exemption for the following reason: “Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.”

Each paramedic program will be asked to provide student attrition information and average number of applications received per class. No identifiable student information will be requested, and with the exception of Bakersfield College, no individual program will be identified in the study. All programs will be advised that they are not required to participate, and that they can end their participation at any time. A consent form will be e-mailed to each program director, and it must be signed and mailed back to the evaluator to be kept on file for future reference. No participating program will experience more than minimal discomfort or risk by participating in the study. Please see the IRB Approval (Appendix D).

CHAPTER FOUR

RESULTS AND DISCUSSION

The following chapter is a report and analysis of the data received from the paramedic schools participating in the study. I will evaluate the information and explore any significant correlation between the findings and the original hypothesis proposed in Chapter 2. Later, I will suggest recommendations based on the results of the empirical analysis.

Program Participation

The directors for each of the 28 accredited paramedic schools in California were contacted via e-mail with a request for information about their program. In addition to the information request, each director was provided a consent form that was to be signed and returned to the researcher. Each program director was asked to supply the following information about their program:

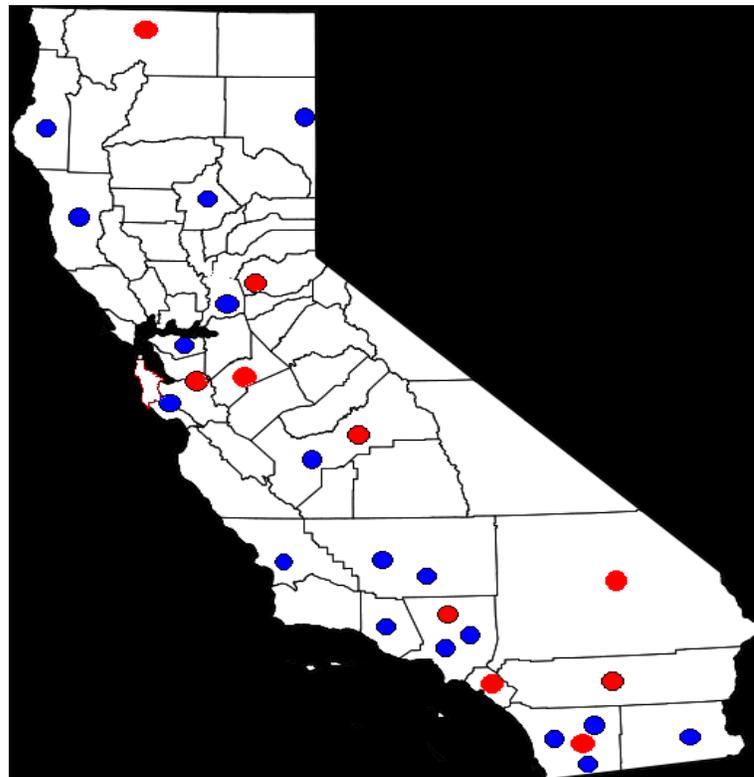
- Total program attrition over the previous 5 years
- Total Didactic attrition over the previous 5 years
- Total Clinical/ Field internship attrition over the previous 5 years
- Average number of applications received per class over the previous 5 years
- Average number of students beginning each class over the previous 5 years
- Average cost of the paramedic program
- A complete list of the program admission standards

Of the 28 schools contacted, 18 schools (64 percent) responded with complete information and another three schools (9.3 percent) responded with incomplete information.

Due to the lack of complete information, these three schools were removed from the study. All of the participating schools were evenly distributed throughout the State as indicated in Figure 1. In the figure, the blue dots represent the locations of participating schools while red dots represent the locations of non-participating schools. The even distribution of participating schools demonstrates that no particular geographic area is over or under represented in this study.

Figure 1

Distribution of Participating and Non-Participating Schools



Admission Standard Classification and Point System

After compiling all of the data, the next step was to classify the admission standards, develop a point system, and analyze the results. Because every program has somewhat different admission standards, a column was created for each standard reported by all schools. This resulted in a data base containing many different category columns. For each admission standard that a program required, an “X” was placed in the column next to the program’s name to represent that program’s standard. If another program had the same standard, it too was given an “X” in the column next to that school’s name. If a program only *recommended* a particular admission standard then the word “RECOMMENDED” was placed in the corresponding admission standard column.

After entering the admission standards for every program, each admission standard category was assigned to one of three sections: Cognitive standards, Psychomotor standards, or Affective standards. Once placed in either the Cognitive, Psychomotor or Affective section, each admission standard was ranked in order of importance, and a point system was used to replace the previous placeholders “X” and “RECOMMENDED”.

The creation of a point system was necessary in order to quantify the admission standards for each program and more easily compare admission standards to total attrition rates. The point system gave 2 points for the most valuable admission standard in each section, 1 point for a high-quality admission standard, and 0.5 points for each Recommended Course. After all points were assigned for the three sections, they were added together to provide an overall admission standard (A.S.) score for each program. (Appendix A).

The following describes the admission standards contained in each of the three sections, describes how the importance of each was determined, and describes the function of the point system.

Cognitive Section

The cognitive section contained the following five admission standards categories: HOBET exam, Math & English competency, EMT exam, Anatomy & Physiology completion, and Recommended Coursework.

Both the HOBET exam and Math & English competency categories ranked in the top of this section, and each category were assigned two points. The logic behind the high ranking of these two categories is simple: the HOBET exam was specifically designed to test a person's cognitive ability, and Math & English competency is the foundation for building general cognitive understanding.

Anatomy and Physiology (A& P) completion and the EMT exam categories received only one point each. Although A&P is a very important course for a student to complete prior to attending paramedic school, only one school required that a student complete this course with a grade of "B" or better. The other schools requiring A&P simply wanted a passing grade, which does not significantly demonstrate a student's expertise of the subject. Therefore, A&P only received a value of one point. The EMT exam only received one point, as well. This is due to the somewhat subjective nature of the EMT exam offered by each school. Because each program is free to develop its own EMT exams, the tests can be extremely difficult or very easy depending on the program.

Lastly, many programs offered a list of Recommended Courses to future applicants. Students are encouraged to complete these courses in order to enhance their chances of

successfully completing paramedic school, and as a way to bolster their resume when applying to a paramedic program. Classes such as EKG interpretation, ACLS, PALS, PHTLS, medical terminology, among others were listed by various schools as Recommended Courses. Because no student must have actually completed these courses to gain acceptance into a program, each Recommended Course received a score of 0.5 points.

Psychomotor Section

The Psychomotor section contained only the following two categories: less than one-year EMT work experience and greater than one-year EMT work experience. Because paramedic knowledge builds upon both the cognitive knowledge and psychomotor skills of the EMT, it was determined that the greater the amount of work experience, the more prepared the student was to handle the challenging environment of paramedic school. Therefore, the category of EMT work experience greater than one-year was seen as more favorable and received two points while EMT work experience of less than one-year was less favorable and received only one point. Again, if a program were to only *recommend* work experience, then it would receive 0.5 points.

Affective Section

The Affective section contained the following two categories: oral interview and letters of recommendation. An oral interview is a highly effective way for program administrators to determine the level of preparation of a particular applicant. It can be used to determine if an applicant has the financial resources, the mental acuity, and the maturity to successfully complete paramedic school. It is also a chance for the applicant to demonstrate their knowledge, skills, and abilities under stressful circumstances. Therefore, due to the very personal nature of the oral interview process, this category received two points. Although

letters of recommendation can be seen as a significant measure of a person's affective domain, they are far more subjective than the oral interview process. The difference is that in an oral interview, the interviewers are making a judgment on how the applicant performs; whereas with letters of recommendation, applicants often seek people that they already know will provide them with a positive review. Therefore, the letters of recommendation category is less significant than the oral interview category and received only one point.

Grouping of Data Sets

After the admission standard information had been collected, codified into one of three sections, and assigned A.S. points, each school was ranked in ascending order from #1 to #18 based on the program's total A.S. score. (Appendix B) Next, a simple data analysis was performed on the total data set (N = 18) to determine the mean score for various categories. Table 1 shows the mean for the following categories: Admission Standard (A.S.) Points, total attrition, didactic attrition, clinical/ field attrition, number of students beginning each class, number of applications received for each class and the program cost.

Table 1

Statistical Means for Total Data Set (N = 18)

A.S. Points	Total Attrition	Didactic Attrition	Clinical/ Field Attrition	Number of Students	Number of Applicants	Program Cost
4.47	24.97%	18.79%	8.45%	25.6	53.7	\$5,163

Based on this information, the data set was divided into two groups. Group A consisted of all schools reporting an A.S. score *above* the mean of 4.47, and Group B was comprised of all schools reporting an A.S. score *below* the mean of 4.47. Group A included seven schools (N = 7), while Group B included the remaining eleven schools (N = 11). Table 2 shows the Group A mean for the following categories: Admission Standard (A.S.) Points,

total attrition, didactic attrition, clinical/ field attrition, number of students beginning each class, number of applications received for each class and the program cost. Table 3 shows the Group B mean for the same categories.

Table 2

Statistical Means for Group A

A.S. Points	Total Attrition	Didactic Attrition	Clinical/ Field Attrition	Average # of Students	Average # of Applicants	Average Program Cost
7.71	18.59%	14.85%	4.98%	26	60	\$7,361

Table 3

Statistical Means for Group B

A.S. Points	Total Attrition	Didactic Attrition	Clinical/ Field Attrition	Average # of Students	Average # of Applicants	Average Program Cost
2.4	29.03%	21%	10.67%	25.4	49.8	\$3,764

Findings

Admission Standard Points

When looking at the total data set, the mean of the admission standard points (A.S.) was 4.47. The A.S. score for Group A was calculated at 7.71 points, which was significantly higher than the score for the total data set. Conversely, the A.S. score for Group B was calculated at 2.4 points, which was 47 percent lower than the mean for the total data set and approximately 68 percent lower than the A.S. score for Group A. Because the A.S. score is based on points given to each school for the quality and quantity of their admission standards, the higher A.S. score noted in Group A indicates that the admission standards implemented by Group A are more rigorous than those of Group B.

Group A versus Group B Admission Requirements

One of the most significant findings of this study is the remarkable difference in the *quality* of the admission standards between the two groups. After ranking the groups based on A.S. points, it became apparent that Group A schools had some common characteristics that distinguished them from Group B schools.

In the cognitive section, for example, three of the seven schools in Group A (42%) required students to successfully complete the HOBET exam compared to just one of the 11 schools (9%) in Group B. Similarly, all seven schools in Group A (100%) required a written EMT exam compared with just two of 11 in Group B (18%). Group A schools also scored higher in the Math/ English requirement, as well. In Group A, five out of the seven schools (71%) had some form of Math/ English competency requirement compared to six out of 11 in Group B (54%).

In the psychomotor section, all seven schools (100%) in Group A required some form of work experience prior to attending their program. Four out of the seven schools (57%) in Group A required a minimum of three months EMT work experience, while the remaining three schools (43%) required at least one-year of EMT experience. Conversely, only six of the 11 Group B schools (54%) had any type of EMT work experience requirement. Four of the 11 Group B schools (36%) required a minimum of three months EMT work experience, one school (9%) *recommended* a minimum of three months EMT work experience, and one school (9%) required a minimum of one-year EMT work experience.

Finally, in the affective section, six of the seven Group A schools (85%) required completion of an oral interview. None of the Group B school required an oral interview for

their applicants. In addition, four of the seven Group A schools (57%) required letters of recommendation compared to just two of 11 Group B schools (18%).

Applications Received

Another interesting finding of this study is the average number of applications received by each program. Group A received an average of 60 applications per class, whereas Group B received an average of 49.8 applications per class. Even though Group A has considerably higher admission standards than Group B, Group A schools received approximately 20 percent more applications than the programs in Group B. The study suggests, therefore, that the implementation of higher admission standards will not negatively affect the number of applications a program will receive. Consequently, any program considering implementing stricter admission standards can feel confident that it will receive a sufficient number of applications to fill each class.

Program Cost

Program cost was another notable finding. The average program cost for Group A was \$7,361. The average program cost for Group B was \$3,764 or approximately 50 percent lower than the Group A schools with lower attrition rates. One theory would suggest that due to the reduced cost of attending a Group B school, the student assumes less financial risk if they were to attrition out of the program. Therefore, it is easier for an applicant to “just try” the program to determine if paramedic school is, in fact, what they really want to do. Applicants to Group A schools assume a greater financial risk and, therefore, have more to lose by failing or dropping out of the program. Consequently, applicants of Group A schools will most likely prepare themselves better than applicants of Group B schools will, leading to lower attrition rates at Group A schools than at Group B schools.

Attrition Rates

Perhaps the most noteworthy finding of the study is the vast difference between the attrition rates of the two groups. Group A reported lower attrition rates than Group B in all categories including total attrition, didactic attrition, and clinical/ field attrition. Table 4 provides a detailed summary of the attrition rates noted in Tables 2-3. The success of Group A schools can be attributed, in large part, to their rigorous admission requirements. Assuming that Group B schools were to implement stricter admission standards for their programs, they would see a significant reduction in their overall attrition rates.

Table 4

Side-by-Side Comparison of Means for Groups A & B

	Total Attrition	Didactic Attrition	Clinical/ Field Attrition
GROUPS A & B	24.97%	18.79%	8.45%
GROUP A	18.59%	14.85%	4.98%
GROUP B	29.03%	21%	10.67%

In addition to the simple averaging of attrition rates, a t-test was performed using Statistical Package for the Social Sciences (SPSS) to determine if the difference of the means in each attrition category had any statistical significance. The results of the t-test for the *Total Attrition* category indicate a statistically significant result at the 0.05 level. T-test for Equality of Means Charts can be found in Appendix C. The t-test for the *Didactic Attrition* was not statistically significant indicating that further research in this area is warranted. The t-test for the *Clinical/ Field Attrition* was statistically significant at the 0.10 level. Table 5 below demonstrates the statistical significance of the t-test performed for each category. Ultimately,

the t-test supports the original hypothesis that a correlation exists between paramedic school admission standards and attrition rates.

Table 5

Statistical Significance of t-test

	GROUP A	GROUP B	STATISTICAL SIGNIFICANCE
Total Attrition	18.59%	29.03%	**
Didactic Attrition	14.85%	21%	*
Clinical/ Field Attrition	4.98%	10.67%	**

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.005$, ***** $p < 0.001$

Discussion

The analysis of the data supplied by the schools in this study has provided some interesting information about the relationship between admission standards and attrition rates. After dividing the data set into two groups using their A.S. score, it became apparent that the group (Group A) with the higher A.S. and consequently, more rigorous admission standards, also had lower overall attrition rates in all categories than Group B.

After completing a t-test to determine the statistical significance of the difference of the means, it was discovered that admission standards are positively correlated to both total attrition and clinical/ field attrition rates. It is important to note, however, that the t-test could not demonstrate a statistically significant difference for didactic attrition rates (Significance 1-tailed = 0.054).

In addition to establishing that a correlation exists between admission standards and attrition rates, the aggregate data suggests that the implementation of stricter admission standards does not limit the average number of applications a program will receive. The data

reinforces the idea that there is a large number of applicants willing to work to meet the minimum standards of any paramedic program.

More importantly, however, is the fact that Group A schools are more successful at retaining students partially because of the rigorous standards that they impose on the applicant. As the data demonstrates, Group A schools maintain higher qualitative and quantitative standards than do Group B schools, and they experience lower student attrition rates as a consequence.

In the following chapter, I will recommend the implementation of various admission standards for the BC paramedic school. All recommendations are based on the findings discussed in this chapter and are strictly designed to reduce BC paramedic school attrition rates.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

Summary

The primary focus of this study was to determine how admission standards affect student attrition in California paramedic schools. The overall purpose of the research was to determine how Bakersfield College paramedic school could reduce its student attrition rates. Of the 28 accredited paramedic schools that were invited to participate in the study, 18 programs (64%) responded with complete information. All of the participating schools provided extremely valuable data with which to make recommendations to Bakersfield College administrators.

According to the data, paramedic schools with stricter admission standards (Group A) had lower total attrition rates and had lower didactic, clinical and field attrition rates than the paramedic schools with lower admission standards (Group B). Despite the stricter admission standards, Group A schools demonstrated that on average they receive approximately 20 percent more applications per class than Group B schools, indicating that stricter admission standards will not necessarily limit a program's pool of candidates.

Group A schools further demonstrated the importance of implementing admission standards that conform to the cognitive, psychomotor, and affective learning domains. As was explained in the previous chapter, Group A exhibited an extraordinary difference in the quality of their admission standards as compared to Group B schools. By requiring students to meet very specific standards, Group A schools were more likely to accept applicants that demonstrated great cognitive, psychomotor, and affective abilities prior to beginning their program. In contrast, Group B schools could not effectively measure an applicant's

cognitive, psychomotor, and affective abilities because they lacked the admission standards to do so. Therefore, Group B schools have a higher likelihood of accepting under-prepared students and experiencing higher attrition rates than Group A schools.

A statistical analysis of the data also confirmed that a correlation existed between admission standards, total attrition, and clinical and field attrition rates. Unfortunately, the statistical analysis could not establish a statistically significant result between admission standards and didactic attrition. Although this finding does not support my original hypothesis, it may be important to look at the myriad factors contributing to didactic attrition. During the didactic phase of paramedic training, students are subjected to enormous levels of stress. Students are often under great financial strain because of the difficulty of working and attending a full-time paramedic program. Students with learning difficulties or returning students can find the pace of paramedic school too much for them to handle and fall behind in their studies, leading to failure. Students may not be mentally prepared for the challenges of paramedic school and drop the program due to lack of interest. Or sometimes “life” simply gets in the way, and student priorities change. Whatever the reasons for student attrition, every paramedic school will inevitably face similar challenges with their students, and this topic presents future researchers with an opportunity to explore the reasons for this anomaly.

Overall, the study suggests that strict admission standards do result in reduced attrition rates. Consequently, this researcher believes that Bakersfield College paramedic school has a great opportunity to implement stricter admission standards and reduce student attrition rates. This researcher’s recommendations are based on the research findings in the previous chapter and are intended to assist Bakersfield College in reducing its overall attrition rates.

Recommendations

Recommendation # 1: Require successful completion of the HOBET exam

Although BC does require completion of an EMT exam during the admission process, this written exam alone does not measure the complete cognitive ability of an applicant. An EMT exam simply measures a person's ability to recall information when faced with answers on a multiple-choice exam. The HOBET exam, however, is a highly comprehensive cognitive exam that is used by both paramedic and nursing programs to measure a student's math, reading, science, critical thinking, and test-taking abilities.

Of the four schools in the study that required completion of the HOBET exam, three of the four were in Group A. It is reasonable to assume that Group A schools understand the importance of measuring a student's cognitive ability prior to accepting the applicant into their program. This exam also helps the student to identify weaknesses in their own processing skills, which will allow the student the ability to correct these problems prior to entering paramedic school.

Although requiring students to successfully complete the HOBET exam will add to the cost associated with applying to BC, Group A schools have already proven that applicants are willing to invest in this exam for the opportunity to attend paramedic school. Therefore, in an attempt to reduce attrition, BC should implement successful completion of the HOBET exam as part of its admission criteria.

Recommendation # 2: Require EMT Work Experience

Even though a few BC paramedic-school staff have noted that some incoming students have sub-par basic life support (BLS) skills, a necessary foundation for more advanced paramedic knowledge, BC still does not require applicants to have any EMT work

experience prior to attending the program. The lack of work experience requirement ignores the psychomotor learning domain that is part of a student's success in paramedic training.

When we look at the studies findings in Chapter 4, we see that all seven of the Group A schools require some work experience for their applicants. By contrast, only 54 percent of Group B schools required work experience for their applicants. The requirement of work experience not only reinforces the psychomotor skills learned through consistently performing BLS tasks, but it places EMTs in the emergency medical environment where they are continuously learning and adding to their overall knowledge base.

Through increased work experience, EMTs learn to become extremely proficient at BLS skills including taking vital signs, splinting broken limbs, performing CPR, hemorrhage control, oxygen administration, using automatic cardiac defibrillation devices, and, most importantly, patient assessment. "In their work experience, EMTs are able to apply their knowledge of the causes and consequences of traumatic injuries and acute illnesses, and develop skills for diagnosing and treating medical conditions and traumatic injuries in the pre-hospital setting" (Chandler, 2007). EMT work experience is extremely important in developing many of the knowledge, skills, and abilities necessary to be successful in paramedic school.

Recommendation # 3: Require Successful Completion of an Oral Interview

As the results of the study show, none of the Group B schools spent the time to interview students during the application phase. Conversely, six of the seven Group A schools required successful completion of an oral interview. Oral interviews are, perhaps, the most valuable way to measure an applicant's affective domain. They provide school administrators with an opportunity to understand the applicant's dedication, preparation and

motivation to attend paramedic school. Oral interviews remain the ideal way for interviewers to measure an applicant's desire to work toward successful completion of paramedic training.

It is essential that BC understands the level of dedication of their applicants prior to accepting them into their program. By offering each applicant an opportunity to articulate their reasons for wanting to attend BC, and what they have done to prepare for the program, BC staff will gain a far more comprehensive picture of the applicant than through a paper application alone. After getting to know the applicant on a more personal level, BC staff can make a more informed decision about whether an applicant has what it takes to complete the BC program. If after the interview process, the interviewers decide that an applicant is not quite ready to attend paramedic school then the interview process has been successful. Ultimately, oral interviews are a great way to weed out any under-prepared applicants and move towards reducing attrition rates.

Conclusion

Bakersfield College paramedic program currently has a great opportunity to implement changes to its admission standards that will help to attract and retain highly qualified applicants. The changes proposed will require that applicants meticulously prepare themselves for a demanding program, and it will ensure that BC will have their choice of extremely motivated and intelligent applicants. Although no paramedic school will ever completely eliminate student attrition, these recommendations will assist BC with reducing its overall student attrition rates.

In closing, I would like to express that I am extremely optimistic about the future of Bakersfield College paramedic program. BC has a wonderful paramedic school with a dedicated staff and supportive administration. I believe that if BC were to implement the

recommendations, it would be well on its way to becoming one of the premier paramedic programs in the state.

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APPENDIX A

Admission Standard Point Distribution Chart

APPENDIX A

Admission Standards Points Distribution for Affective (A) and Cognitive (Cog) Sections

	<u>ORAL</u> <u>INTERVIEW</u> <u>(A) 2</u>	<u>LETTERS OF</u> <u>REC. (A) 1</u>	<u>HOBET (Cog)</u> <u>2</u>	<u>MATH/ ENGLISH</u> <u>(Cog) 2</u>	<u>EMT EXAM (Cog) 1</u>
School 1	2	1	2	1	1
School 2	2	1		2	1
School 3	2	1	2		1
School 4	2	1		2	1
School 5	2			2	1
School 6				2	1
School 7	2		2		1
School 8				2	
School 9					
School 10		1			
School 11			2		1
School 12		1		1	
School 13				1	
School 14					1
School 15				2	
School 16				2	
School 17					
School 18				2	
<u>Number of</u> <u>Schools</u>	6/ 18	6/ 18	4/ 18	11/ 18	9/ 18

APPENDIX A

Admission Standards Points Distribution for Psychomotor (P) and Recommended Coursework Section

	<u>EMT EXP. 1 YR (P) 2</u>	<u>EMT EXP. 3-6 MNTH (P) 1</u>	<u>RECOMMENDED COURSEWORK 0.5</u>
School 1		1	ACLS/PALS/PHTLS/ PREP/ EKG INT. (2.5)
School 2	2		PREP COURSE (0.5)
School 3		1	COLLEGE DEGREE (0.5)
School 4		1	
School 5	2		
School 6	2		
School 7		1	
School 8			
School 9			
School 10		1	
School 11			
School 12		1	
School 13		0.5	EKG INTERPRETATION (0.5)
School 14			
School 15		1	
School 16		1	
School 17	2		
School 18			
<u>Number of Schools</u>	4/ 18	9/ 18	4/ 18

APPENDIX B**Groups A & B Calculated Mean Charts**

APPENDIX B

Calculated Mean for Total Data Set

	<u>A.S. POINTS</u>	<u>Total Attrition</u>	<u>Didactic Attrition</u>	<u>Clinical/ Field Attrition</u>	<u>Number of Applications</u>	<u>Number of Students</u>	<u>Cost</u>
School 1	11	7.34%	7.80%	4.58%	75	37	\$11,062
School 2	9.5	28.70%	18.60%	9.70%	48	26	\$3,000
School 3	7.5	10.36%	5.50%	6.20%	97	44	\$12,000
School 4	7	13%	13%	0%	18	12	\$11,425
School 5	7	40.00%	34.30%	8.70%	102	35	\$2,000
School 6	6	14.83%	12.28%	1.75%	30	16	\$2,883
School 7	6	15.90%	12.50%	3.90%	50	12	\$9,160
School 8	4	32%	23%	9%	30	23	\$2,500
School 9	3.5	24.90%	30.10%	4.80%	85	36	\$2,000
School 10	3	17.00%	13%	4.60%	35	20	\$1,775
School 11	3	24.30%	14.00%	11.82%	36	28	\$6,000
School 12	3	28.40%	22.50%	8.62%	43	25	\$2,000
School 13	3	33.40%	16.70%	20.00%	25	18	\$2,135
School 14	2	21.30%	18.20%	4.60%	115	30	\$1,660
School 15	2	38.00%	22%	5%	25	20	\$6,300
School 16	2	49%	33%	18%	65	30	\$1,029
School 17	1	31%	27%	5.9%	34	20	\$5,000
School 18	0	20.00%	15%	25%	55	30	\$11,000
MEAN	4.47	24.97%	18.79%	8.45%	53.77	25.6	\$5,163

APPENDIX B

Calculated Mean for Group A

	<u>A.S. POINTS</u>	<u>Total Attrition</u>	<u>Didactic Attrition</u>	<u>Clinical/ Field Attrition</u>	<u>Number of Applications</u>	<u>Number of students</u>	<u>Cost</u>
School 1	11	7.34%	7.80%	4.58%	75	37	\$11,062
School 2	9.5	28.70%	18.60%	9.70%	48	26	\$3,000
School 3	7.5	10.36%	5.50%	6.20%	97	44	\$12,000
School 4	7	40.00%	34.30%	8.70%	102	35	\$2,000
School 5	7	13%	13%	0%	18	12	\$11,425
School 6	6	14.83%	12.28%	1.75%	30	16	\$2,883
School 7	6	15.90%	12.50%	3.90%	50	12	\$9,160
MEAN	7.71	18.59%	14.85%	4.98%	60	26	\$7,361

APPENDIX B

Calculated Mean for Group B

	<u>A.S. POINTS</u>	<u>Total Attrition</u>	<u>Didactic Attrition</u>	<u>Clinical/ Field Attrition</u>	<u>Number of Applications</u>	<u>Number of Students</u>	<u>Cost</u>
School 8	4	32%	23%	9%	30	23	\$2,500
School 9	3.5	24.90%	30.10%	4.80%	85	36	\$2,000
School 10	3	17.00%	13%	4.60%	35	20	\$1,775
School 11	3	24.30%	14.00%	11.82%	36	28	\$6,000
School 12	3	28.40%	22.50%	8.62%	43	25	\$2,000
School 13	3	33.40%	16.70%	20.00%	25	18	\$2,135
School 14	2	21.30%	18.20%	4.60%	115	30	\$1,660
School 15	2	38.00%	22%	5%	25	20	\$6,300
School 16	2	49%	33%	18%	65	30	\$1,029
School 17	1	31%	27%	5.9%	34	20	\$5,000
School 18	0	20.00%	15%	25%	55	30	\$11,000
MEAN	2.40909	29.03%	21%	10.67%	49.8	25.5	\$3,764

APPENDIX C

Results of t-test

Total Attrition t-test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error	95% Confidence interval	
Equal variances assumed	.528	.478	-2.129	16	.049	-10.43727%	4.90159%	-20.8%	-.0463%
Equal Variances Not Assumed			-2.015	10.684	.070	-10.43727%	5.18023%	-21.8%	1.0055%

Didactic Attrition t-test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error	95% Confidence interval	
Equal variances assumed	.285	.600	-1.700	16	.108	-6.46390%	3.80188%	-14.52%	1.595%
Equal Variances Not Assumed			-1.567	9.749	.149	-6.46390%	4.12505%	-15.68%	2.759%

Clinical/ Field Attrition t-test

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error	95% Confidence interval	
Equal variances assumed	4.006	.063	-1.936	16	.071	-5.69156%	2.94012%	-11.92%	.5412%
Equal Variances Not Assumed			-2.238	15.319	.041	-5.69156%	2.54367%	-11.10%	-.2796%

APPENDIX D

Institutional Review Board Approval



**Grants, Research, and Sponsored Programs
California State University, Bakersfield**

24 DDH
9001 Stockdale Highway
Bakersfield, California 93311-1022

(661) 654-2231
FAX (661) 654-3342

Institutional Review Board for Human Subjects Research

Anne Duran, Ph.D.
Department of Psychology
Scientific Concerns

Roseanna McCleary, Ph.D.
Masters of Social Work
Scientific Concerns

Robert Carlisle, Ph.D.
Department of English
Nonscientific/Humanistic
Concerns

Lily Alvarez, B.A.
Kern County Mental Health
Community Issues/Concerns

Kathleen Gilchrist, Ph.D.
Department of Nursing
Scientific Concerns

Paul Newberry, Ph.D.
Department of Philosophy/
Religious Studies
Nonscientific/Humanistic Concerns
IRB/HSR Chair

Gary Bashor, D.Min.
Community Issues/Concerns

Carolyn Wade-Southard, MFT
Community Issues/Concerns

Yeunjoon Lee, Ph.D.
Department of Special Education
Nonscientific/Humanistic Concerns

Steve Suter, Ph.D.
Department of Psychology
Research Ethics Review Coordinator
and IRB/HSR Secretary

Robert Horton, Ph.D.
Interim AVP
Grants, Research,
and Sponsored Programs
Ex-Officio

Date: 16 April 2009
To: Charles Brown, PPA Student
cc: Paul Newberry, IRB Chair
Chandra Commuri, Public Policy and Administration
From: Steve Suter, University Research Ethics Review Coordinator
Subject: Exemption from Full Review for Protocol 09-79

I am pleased to inform you that your request for exemption from full IRB/HSR review has been approved. You are authorized to carry out your research entitled, "Affects of Stricter Admission Standards on BC Paramedic School Attrition Rates". This research activity is exempt as defined in Paragraph 46.101 of Title 45, Code of Federal Regulations based on the following criteria: (1) Research involving the use of [standardized] educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior, UNLESS: (a) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects, and (b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation. Approval is based on your materials received on 4-09-09 and your clarifications in response to reviewer comments completed on 4-16-09.

The following person[s] only are authorized to interact with subjects in collecting data or obtaining informed consent:

**Human Subjects Protection Training Certified:
Charles Brown [4-03-08] & Chandra Commuri [11-10-03]**

Any signed consent documents must be retained for at least three years to enable research compliance monitoring and in case of concerns by research participants. Consent forms may be stored longer at the discretion of the principal investigator [PI]. The PI is responsible for retaining consent forms. If the PI is a student, the faculty supervisor is responsible for the consent forms. The consent forms must be stored so that only the authorized investigators or representatives of the IRB have access. At the end of the retention period the consent forms must be destroyed [not re-cycled or thrown away]. Please destroy all audio tapes after scoring.

This authorization will be valid until the end of March 2010. If more time is needed, you must request an extension from the Board. If you have any questions, or there are *any changes to your protocol, unanticipated problems, or adverse reactions*, please contact me immediately. Thank you.


Steve Suter, University Research Ethics Review Coordinator