The attrition rate of students in master’s level nurse anesthesia programs

MARY ELLEN MATHIS, CRNA, MAE*
Austin, Texas
*Winner of 1991 Student Writing Contest

This survey was conducted in October 1990. Survey forms were sent to all nurse anesthesia programs offering master’s degrees. The purpose of the study was to determine the dropout rate of students who did not complete their programs during the period from 1985 to 1990. Directors were asked to rate their satisfaction to determine if students were more likely to leave because of clinical or academic difficulties or for personal reasons. The time frame and the circumstances surrounding the students’ departures were also examined.

The attrition rate of programs ranged from 0-25% (mean = 8.2%). More than half the students left for personal reasons. The remainder were almost equally divided between clinical and academic reasons. In fact, many directors had difficulty distinguishing between these two causes. Most students left during the first 12 months of their program, and more than half of them were not encouraged to resign. A large majority (78%) of directors found their program’s attrition rate to be very acceptable.

Key words: Attrition, dropout, nurse anesthesia education.

Introduction

There is currently a great shortage of certified registered nurse anesthetists (CRNAs) which will not be alleviated until changes are made to increase the number of graduating anesthesia students. Either more programs will be needed, or existing programs will have to increase their number of graduates. Because of the changes in accreditation standards in the 1970s and the implementation of Medicare’s prospective payment plan, which reimbursed medical residencies in anesthesia but not nurse anesthesia programs, the number of nurse anesthesia programs has declined drastically. At the end of 1989 there were 92 programs as compared to 161 programs in 1980, a reduction of more than 40%.2,3 In the period from 1980 to 1986, the number of new CRNAs declined from 1,000 to 700 per year, a 30% reduction.4 As a result of an increase in the number of elderly patients, as well as a predicted increase in both surgical and obstetrical anesthesia cases, a recent study projected a need for 40% more CRNAs by the year 2010.5 Ouellette and Zambricki proposed a goal of 900 graduates per year, with approximately 8-10 graduates per class and a constant of 90-110 programs. At the time of their report in 1987, there were only 6.94 graduates per program.3

The assertion might be made that the upcom-
ing requirement for all programs to be in a master's degree format will have a negative effect on the total number of programs. Undoubtedly, some programs will be forced to close because of more stringent requirements, lack of qualified faculty, and lack of a university affiliation. Of the 92 programs in existence at the end of 1989, 32 programs—or approximately 35%—did not offer a master's degree. Of these 32 programs, one certificate program closed in 1990 and another certificate program closed in 1991. As more programs close, the shortage of CRNAs will become more critical.

The success of a specific educational program is ultimately measured by the performance of its individual participants. A successful graduate program makes an important financial and academic contribution to the university as a whole. Program directors and faculty are rightfully concerned with dropout rates and student success. Program directors typically use criteria such as grade point average, Graduate Record Examination scores, work history, psychomotor and communication skills, interviews and references as part of their selection process. In addition to the financial loss it represents, student attrition may reflect faulty judgment by program administrators concerning a student's projected capabilities and success.

In anesthesia programs, the number of openings for incoming students is necessarily limited. When students do not complete a program, for whatever reason, their positions cannot be filled. This wastes openings which might have been filled by other applicants who might have been able to complete the program.

Knowledge of a program's rate of attrition—especially compared to a national norm—would provide information to administrators and faculty which could be used to modify the selection process and the structure of their programs. Perhaps changes could be implemented which might decrease the rate of attrition or increase the number of openings in order to accommodate the number of students who do not complete the program.

Student characteristics

Many studies have been done in an attempt to correlate characteristics of students with their success or dropout rate in graduate programs. Most have failed to show a correlation between gender and marital status and educational success. Although some studies demonstrated a correlation between previous academic achievement and later success, others have shown that undergraduate grade point average does not appear to be a significant factor in the success rate of graduate students. Crumrine and Warrick, in their study concerning anesthesia residents, point out that this may be because only the brightest students have progressed to this point in their education. This observation could be extrapolated to apply to nurse anesthesia students as well.

Although Murden and associates demonstrated that maturity, nonacademic achievement, and motivation all significantly correlated with positive clinical performance in medical school, other studies specific to adult learners did not substantiate this finding. The degree of motivation appears to vary with the field studied, making it very difficult to apply data from one discipline to another. It also has been shown that students often do not complete programs because of external factors such as financial and family obligations, illness, and time constraints. Flannery notes that returning adult students are often older, with job and family obligations, and are returning to school for job-related reasons. She cites the stress of balancing multiple roles, such as family, school, and work, as a possible reason for dropping out.

Stress has been implicated as affecting success in the academic and clinical arenas. As an adaptation to change, stress may enhance or hinder performance. Typically, it is thought that the degree of stress and the individual's ability to cope with it are the determining factors. Nurse anesthesia students have many stressors, including didactic and clinical requirements, loss of income, relocation, and lack of time for family and personal life.

Attrition rate

Although no studies exist which examine the attrition rate for nurse anesthesia students, several studies have been done for other graduate disciplines. The attrition rate varies from 3-50%, depending on the discipline, type of program, and student profile. In a comprehensive study of all graduate programs at New Mexico State University, Matchett found that the attrition rate varied most on the basis of discipline rather than ethnic origin or gender. Although the overall attrition rate in his study was found to be 30%, it was slightly higher for engineering and education (35%), average for physical science (27%), and slightly lower for agriculture (19%).

Attrition rates were found to be only 3% in the School of Education and the Colleges of Agriculture and Life Science at the University of Wisconsin. The attrition rate was found to be 50% in a nontraditional, off-site program that offered a master's degree in liberal studies.

Methodology

Research questions. The following research
questions were examined in this study:
1. What is the attrition rate for students in nurse anesthesia master’s programs?
2. What is the prevalent reason why students do not complete their programs?
3. Is there a common point in the program at which students are most likely to drop out?
4. Are students more likely to be dismissed or to resign?
5. How often are students encouraged to resign?
6. How acceptable do directors find the attrition rates of their programs?

For the purposes of this study, the following definitions were utilized:
- **Attrition** is defined as a natural or expected decrease in number or size. For the purposes of this paper, the attrition rate will refer to the change from the number of students embarking on a nurse anesthesia program to the number actually graduating.
- **Success** will refer to the attainment of all requirements necessary for graduation. It will not address results of national boards or achievement of actual employment as a nurse anesthetist.
- **Dropout** will refer to students who, once having started a nurse anesthesia program, do not graduate for whatever reason. Dropout will refer both to the student who fails as well as to the student who withdraws or resigns from a program.

The purpose of this study was to analyze attrition for all students in nurse anesthesia master’s

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**Table I**

<table>
<thead>
<tr>
<th>Attrition survey</th>
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</thead>
<tbody>
<tr>
<td>How long is your program?</td>
</tr>
<tr>
<td>Has the length changed in the past 5 years?</td>
</tr>
<tr>
<td>If yes, how long was it before?</td>
</tr>
<tr>
<td>When did it change?</td>
</tr>
</tbody>
</table>

On a scale of 1 to 3, please rate your satisfaction with the attrition rate of your program.

<table>
<thead>
<tr>
<th>Unacceptable</th>
<th>Moderately acceptable</th>
<th>Very acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

The following questions pertain to students who have participated in your nurse anesthesia program in the past five years. Please respond only regarding students who have entered a master’s degree program.

How many students have entered your program with intent to graduate in the following years? Of these, how many did not complete the program? Were they dismissed or did they resign?

<table>
<thead>
<tr>
<th>Graduating class</th>
<th>Entered</th>
<th>Did not complete</th>
<th>Dismissed</th>
<th>Resigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1987</td>
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<td></td>
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<td>1988</td>
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<tr>
<td>1990</td>
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</tbody>
</table>

Please number the students for years 1986-1990 who did not complete the program (no names, please), and answer the following questions for each student. Use reverse side for additional students.

<table>
<thead>
<tr>
<th>For what deciding reason did the student leave your program?</th>
<th>Were they encouraged to resign?</th>
<th>When did they leave the program?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(choose only one category)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal</td>
<td>Clinical</td>
<td>Academic</td>
</tr>
<tr>
<td>Student 1</td>
<td></td>
<td></td>
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<tr>
<td>Student 2</td>
<td></td>
<td></td>
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<tr>
<td>Student 3</td>
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<td>Student 4</td>
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<td>Student 5</td>
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<td>Student 6</td>
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<td>Student 7</td>
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<td>Student 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student 9</td>
<td></td>
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</tr>
</tbody>
</table>

If you also offer a nonmaster’s format, did any of the students complete the nondegree program? Yes | No
If yes, how many? ____________

On the back, please feel free to add any comments which you feel may be helpful. Your signature is optional.
programs during the period from 1986 to 1990. The population for this survey was all directors of nurse anesthesia programs which offer master's degrees. Because it was small enough, the entire population was used. A survey of the directors of master's level nurse anesthesia programs was utilized to elicit the desired information (Table I). The survey was critiqued by the program directors and research classmates to assess face and content validity, and their suggestions were incorporated in the survey. The objectives for the survey were delineated in the research questions.

The design was a descriptive study using a survey developed by the researcher. In September 1990, the surveys were sent to all directors of master's level programs as listed by the Council on Accreditation of Nurse Anesthesia Educational Programs. A cover letter with an explanation of the research project and a request for participation was included. Surveys were coded so that the identities of directors were known only to the primary researcher. A second copy of the survey was sent to all directors who did not respond within 3 weeks.

Data were nominal, except for research question 6, which was of the ordinal type. Descriptive statistics—frequency, percentage, and mean and standard deviation—were used to analyze the data.

## Results

Sixty surveys were mailed. The initial response rate was 78%, and, after the second mailing, the response rate was 86%. Four responses were not used. One program, although listed as such, did not consider itself a master's program. Three other programs had not yet graduated any students from their master's format. Although two respondents did not finish the whole survey, the completed portions were utilized in the data analysis.

The length of the programs ranged from 24 to 31 months, with 24 months being the most common length (Table II). During the period from 1985 to 1990, 33% of the respondents reported a change in the length of their programs. Seven programs (44%) made such a change in 1988. Of those that changed, three programs (19%) decreased in length by 2, 3, or 12 months and 13 programs (81%) increased their length by 1 to 6 months. Of those whose length decreased, two had previously increased the length.

The directors were asked to rate their satisfaction with the attrition rate of their programs using a scale of 1 to 3, with 1 being unacceptable, 2 being moderately acceptable, and 3 being very acceptable. No respondent rated his or her satisfaction to be unacceptable. Moderately acceptable was chosen as a response 22% of the time, and 78% of the directors found their attrition rate to be very acceptable.

During the 5-year period studied, a total of 1,696 students entered master's level nurse anesthesia programs. Of these, 136 students (8%) did not complete their programs. Of those who did not complete them, 39% were dismissed and 60% resigned. Two students died.

The attrition rate for individual programs over the 5-year period ranged from 0-25%. The mean attrition rate for individual programs was found to be 8.2%. The median rate for each program was 6.4%, and the mode or most frequent response was 0%. The standard deviation was found to be 6.6%.

For each of the 5 years studied, the attrition rate ranged from 6.7-9.2%. For the students who did not complete the program, the annual dismissal rate was found to range from 29% to 53%, and the resignation rate was found to range from 44% to 71% (Table III). The mean attrition rate of different programs ranged from 6.1-9.4% and the median attrition rate from 0% to 8%, while the mode for all years was 0% (Table IV). While the mean attrition rate rose from 1986 to 1990, so also did the number of entering students and the number of students who successfully completed their programs (Figures 1 and 2).

Directors were asked to choose from among the following reasons and select only one to describe why their students did not complete the program: personal, clinical, or academic. For 20 students (16%), directors were unable to choose just one factor. Of those who were able to choose one answer, it was reported that students left for personal reasons 55% of the time, for clinical difficulties 20% of the time, and for academic difficulties 25% of the time. Of those who could not delineate one specific reason for a student's failure to complete the program, the most frequently cited reasons were a combination of clinical and academic difficulties. Overall, personal reasons were reported with a frequency of 46%, clinical reasons

<table>
<thead>
<tr>
<th>Table II</th>
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<tbody>
<tr>
<td><strong>Length of Programs</strong></td>
</tr>
<tr>
<td><strong>Length (months)</strong></td>
</tr>
<tr>
<td>24</td>
</tr>
<tr>
<td>26</td>
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<tr>
<td>27</td>
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<tr>
<td>30</td>
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<tr>
<td>31</td>
</tr>
</tbody>
</table>
17%, academic reasons 21%, and a combination of reasons 16% (Figure 3). Comments made by directors regarding personal reasons for leaving programs included illness, pregnancy, and transfer to another program.

It was reported that, in 60% of the cases, students were not encouraged to resign. Comments made by directors ranged from the statement, "Once a struggling student is on a dismissal course, we always encourage them to resign rather than to be dismissed," to "If a student has a clinical or academic difficulty, we dismiss the student. Hence, students are not encouraged to resign if [they are] failing." Regarding the phrase "encouraged to resign," one director explained that "encouraged is defined as making it an option for the student. The student was also encouraged to remain for further evaluation but declined."

Most students who did not complete a program left during the first year. Only 25% of the students left after the first 12 months of a program.

Discussion

By studying attrition in all master's level programs over a 5-year period, it was found that it averaged about 8%. Though the mean attrition rate rose gradually from 1986 to 1990, so also did the number of students who completed their programs.
When viewing attrition, one must keep in mind that what is of ultimate concern to the profession of nurse anesthesia is to maintain or improve the number of qualified practitioners. While perhaps the number of graduates is not sufficient to satisfy the current demand for anesthetists, it also appears as if improvements are slowly occurring.

Of interest is the fact that the mode or the most commonly occurring attrition rate was 0%. This correlates with the fact that 78% of the directors found their attrition rate to be very acceptable. Although an attrition rate of 0% is certainly commendable, one questions whether all these graduates go on to become successful practitioners. A follow-up study comparing a program's rate of attrition with the percentage of those passing the certification examination would yield additional information. The ability to practice nurse anesthesia is not determined at the time of graduation, but rather at the time of certification. Perhaps not all attrition is "bad." Indeed, some attrition may be necessary to serve as a safeguard in maintaining high standards for practitioners and increasing the likelihood of successfully completing the certification examination.

This survey was designed to include only those programs which offer a master's degree, since this is the degree that will be required by the late 1990s. Five percent of the respondents were so new to the master's format that they had not yet graduated any students. Although the number of graduates from master's programs has increased during the last 5 years, one might wonder if this occurred due to the shifting of programs from certificate to advanced degree. For this reason, the exclusion of nonmaster's programs is a limitation of this study.

Directors were often unable to choose only one reason why students left their programs. When reviewing the data, it became obvious that it is often a combination of reasons that contribute to their failure to complete. It was especially difficult to differentiate students who displayed both academic and clinical problems. It would seem that these factors are closely related. Students must take the knowledge they gained in the academic setting and apply it in the clinical setting to be effective anesthetists.

Of concern is the finding that more than 50% of the students left for personal reasons. Although this included health-related problems, one wonders about the connection between motivation and the ability to complete a program of anesthesia. If directors were able to effectively screen candidates for their degree of interest in anesthesia and their level of motivation, perhaps the number of students leaving programs for personal reasons would decline.

An area indicated for future study would be the correlation between preacceptance screening criteria used by individual programs and that program's prevailing reasons for attrition. Perhaps programs with a high rate of attrition for clinical and academic reasons need to reexamine their requirements for the level and amount of clinical experience, undergraduate grade point average, and Graduate Record Examination scores. Programs with a high rate of attrition for personal reasons might choose to add to or adjust their techniques for determining student's level of interest in anesthesia and the degree of motivation required to complete their program.

**Summary**

Faced with a rising demand for CRNAs, the premise was explored that existing anesthesia programs need to increase the number of graduates or more programs need to be added. The number of programs has diminished yearly and will probably continue to do so as nonmaster's programs are phased out. With this in mind, it may be realistic to attempt to increase the number of graduates from each program. This could be done either by increasing the numbers of those entering existing anesthesia programs or by decreasing the number who do not complete their programs. This survey studied attrition in master's level anesthesia programs. Attrition was found to be about 8% overall, with the majority of directors finding their program's attrition rate to be very acceptable. Most students left for personal reasons, while the next most numerous group had academic difficulties. The majority of students left during

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**Figure 3**

**Prevailing reasons students left**

- Combination (16%)
- Clinical (17%)
- Personal (46%)
- Academic (21%)
the first year of their program, and less than half were encouraged to resign.

Directors of programs with very low attrition may find that they need to expand by increasing the number of new students. Other programs may choose to try to lower their attrition rates. By examining the causes of attrition and correlating these causes with screening criteria for applicants, directors may be able to eliminate those applicants who would be unsuccessful in their programs and instead choose others who would successfully complete them.

REFERENCES


AUTHOR

Mary Ellen Mathis, CRNA, MAE, graduated with a bachelor of science in Nursing from Vanderbilt University, Nashville, Tennessee, in 1979. She received a master of Anesthesiology Education from Sacred Heart Medical Center/Gonzaga University, Spokane, Washington, in 1991. Ms. Mathis is currently employed as a staff anesthetist for Capitol Anesthesiology Association, Austin, Texas.