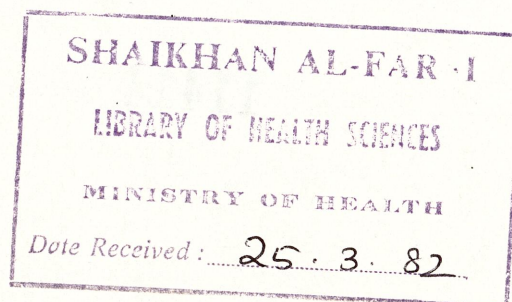


THE RELATIONSHIP BETWEEN ADMISSION
CRITERIA AND ACADEMIC SUCCESS IN
NURSING AND ALLIED HEALTH

BY

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THESIS

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BK

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>PAGE</u>
I.	INTRODUCTION..... 1
	A. Statement of the Problem..... 3
	B. Significance of the Study..... 3
	C. Limitations of the Study..... 4
	D. Definition of Terms..... 4
II.	LITERATURE REVIEW..... 6
	A. Measures of Academic Achievement..... 7
	B. Measures of Non-Academic Achievement..... 15
	C. Measures of Background, Work and other Experiences..... 17
	D. Summary..... 18
III.	METHODOLOGY..... 20
	A. System of Admission..... 20
	B. Definition of Instruments..... 23
	C. Sample..... 25
	D. Research Hypotheses..... 25
	E. Data Analysis..... 25
IV.	RESULTS..... 28
V.	DISCUSSION AND CONCLUSIONS..... 46
VI.	APPENDIX A..... 51
VII.	CITED LITERATURE..... 52
VIII.	BIBLIOGRAPHY..... 55
IX.	VITA..... 57

LIST OF TABLES

<u>TABLE</u>		<u>PAGE</u>
I	CHANGES IN ADMISSION PROCEDURES (1976-1980).....	21
II	NUMBER OF STUDENTS ADMITTED AND GRADUATED (1976-1980).....	21
III	PERCENTAGES GIVEN TO THE ENTRANCE EXAMINATIONS in 1979.....	22
IV	PERCENTAGES GIVEN TO THE ENTRANCE EXAMINATIONS IN 1980.....	23
V	DISTRIBUTION OF STUDENTS IN THE SAMPLE EACH YEAR.....	26
VI	NUMBER OF GRADUATING STUDENTS FROM THE SIX PROGRAMS.....	26
VII	MEANS AND STANDARD DEVIATIONS OF THE PRE- DICTOR AND CRITERION VARIABLES BY PROGRAM AREAS.....	29
VIII	MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND CRITERION VARIABLES FOR DROPOUTS AND CONTINU- ING STUDENTS IN 1978.....	30
IX	MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND CRITERION VARIABLES FOR DROPOUTS AND CONTINUING STUDENTS IN 1979.....	31
X	MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND CRITERION VARIABLES FOR DROPOUTS AND CON- TINUING STUDENTS IN 1980.....	32
XI	<u>TAWJEHIE</u> MEAN, STANDARD DEVIATIONS AND T-TEST VALUES OF THE CONTINUING STUDENTS AND DROP- OUTS BEFORE TERM 1 FOR ALL THE PROGRAMS COM- BINED IN 1978, 1979 AND 1980.....	34
XII	THE COLLEGE ENGLISH ENTRANCE EXIMINATION'S MEAN, STANDARD DEVIATION AND T-TEST VALUES OF THE CON- TINUING STUDENTS AND DROPOUTS BEFORE TERM 1 FOR ALL THE PROGRAMS COMBINED IN 1978, 1979, AND 1980	35

LIST OF TABLES (CONTINUED)

<u>TABLE</u>		<u>PAGE</u>
XIII	THE COLLEGE SCIENCE ENTRANCE EXAMINATION'S MEAN, STANDARD DEVIATION AND T-TEST VALUES OF THE CONTINUING STUDENTS AND DROPOUTS BEFORE TERM 1 FOR ALL THE PROGRAMS COMBINED IN 1978, 1979 AND 1980..	36
XIV	THE COLLEGE APTITUDE TEST'S MEAN, STANDARD DEVIATION AND T-TEST VALUES OF THE CONTINUING STUDENTS AND DROPOUTS BEFORE TERM 1 FOR ALL THE PROGRAMS COMBINED IN 1978, 1979, and 1980.....	37
XV	MEANS AND STANDARD DEVIATIONS OF THE SECOND YEAR COMULATIVE AVERAGE FOR THE NURSING, MEDICAL LABORATORY AND PHARMACY PROGRAMS IN 1978 AND 1979.....	38
XVI	MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND CRITERION VARIABLES FOR ALL PROGRAMS COMBINED IN 1978, 1979 AND 1980.....	39
XVII	COMBINATION OF MEASURES WHICH PROVIDE SIGNIFICANT PREDICTION OF FIRST-YEAR CUMULATIVE AVERAGE FOR ALL ENTERING STUDENTS IN 1978, 1979 AND 1980 IN THE ORDER OF THEIR PREDICTIVE CONTRIBUTION.....	40
XVIII	COMBINATION OF MEASURES WHICH PROVIDE SIGNIFICANT PREDICTION OF FIRST-YEAR CUMULATIVE AVERAGE FOR STUDENTS IN THE COMBINED PROGRAMS IN 1978-1980 IN THE ORDER OF THEIR PREDICTIVE CONTRIBUTION.....	42
XIX	COMBINATION OF MEASURES WHICH PROVIDE SIGNIFICANT PREDICTION OF SECOND-YEAR CUMULATIVE AVERAGE FOR THE NURSING, MEDICAL LABORATORY AND PHARMACY STUDENTS ENTERING IN 1978, 1979 AND 1980.....	43
XX	A SUMMARY OF THE PREDICTIVE SIGNIFANCE OF THE TAWJEHIE, COLLEGE ENGLISH ENTRANCE EXAMINATION COLLEGE SCIENCE ENTRANCE EXAMINATION, COLLEGE APTITUDE TEST TO FIRST - AND SECOND - YEAR GRADES BY STUDENT GROUPS.....	44

LIST OF ABBREVIATIONS

ACT	American College Testing
AHPAT	Allied Health Professions Admissions Test
CHS	College of Health Sciences
GPA	Grade point average
N	Number of students
R	Regression coefficient
SAT	Scholastic Aptitude Test
S.D.	Standard deviation

SUMMARY

The aim of this study was to examine the effectiveness of the admission criteria employed by the College of Health Sciences in Bahrain from 1978 to 1980, in predicting future academic achievement. The preadmission data of 454 students were analyzed for their predictive abilities of the cumulative grades at the end of the common core for all programs offered in the College and the cumulative grades at the end of the second-year for the Nursing, Medical Laboratory and Pharmacy Programs. The stepwise regression analysis from the Statistical Analysis System was used to study prediction.

Findings indicated that the College English Entrance Examination was significant ($p < .05$) in predicting first-year grades in Nursing and Medical Laboratory only. This examination was also significant in predicting the first-year grades for all programs when combined. It was significant ($p < .05$) in predicting second-year grades in Nursing only.

The College Science Entrance Examination was found to be more significant in predicting second-year grades than those of the first-year grades especially in Nursing and Pharmacy.

The Tawjehie was the best predictor of first-year grades in Pharmacy only. It was not significant in predicting second-year grades in any of the Programs.

The College Aptitude Test was found to be the strongest predictor of the second-year cumulative grades in Medical Laboratory and Pharmacy. It was not significant in predicting first-year cumulative grades.

However, when all Programs were combined in 1978, it was found to be a weak predictor.

Based on these findings, it was suggested that an Entrance Examination in English and Science, high school GPA and a new examination measuring the attitudes of the students, be the basis of the selection procedure in the College of Health Sciences. Furthermore, it was recommended that comprehensive orientation program about the students' future roles in various health professions, should be implemented. This step may help alleviate the problem of high dropouts when combined with the new admission procedures.

I. INTRODUCTION

The College of Health Sciences (CHS) was established by the Ministry of Health, State of Bahrain in April, 1976. As a public educational institution, it is owned, funded, administered and controlled by the Government. The first class of students was admitted in October, 1976.

Presently, the College offers six training programs leading to the Associate Degree in Health Sciences. These programs are General Nursing, Medical Laboratory, Pharmacy, Public Health, Diagnostic Radiography and Medical Equipment Maintenance.

The basic qualification for admission to all the programs is the successful completion of Tawjehie which is the High school Certification Exam. The overall curriculum is of two-years duration except nursing which is presently a three-year program. Each academic year is divided into trimesters. At the end of each trimester, a final exam is given based on the course content of that term. During the first two terms of the academic year, all students are enrolled in the common core curriculum. The criteria for selection vary among the six specialty areas. For example, a student wishing to be in the nursing program should have achieved high grades in the Anatomy, Physiology and English courses during the common core. But a prerequisite to the Medical Laboratory Program is good grades in the chemistry courses upon successful completion of the first two terms.

More than 800 students entered the CHS programs since its inception in 1976. As of this date only 454 students have completed the program. Thus, the Ministry of Health has committed substantial

financial and manpower resources in training mid-level health personnel in Bahrain. In spite of this, there has been little effort to evaluate the system by which candidates applying to this institution are screened and admitted into the programs. The college is faced with a number of issues which reflect on its admission policies. The most important one is the universal concern as to whether the admission criteria are actually effective in identifying applicants with the potential of academic success. It is necessary for the College's and in turn the Ministry's officials to be satisfied that the students being selected to enroll in the College are those who are most likely to complete their training and continue to work as competent health professionals and thus reduce the dependence of health services on expatriate staff. To date there are no data to document the validity and reliability of the admission procedures.

The issue of proper selection of candidates in mid-level health training programs goes beyond the boundaries of Bahrain. Bennett et al. (1980, Appendix A) identifies factors underlying admission which are more in the areas of political and promotional domains than the basic academic qualifications. There is a great deal of pressure being placed on attracting the proper pool of candidates who may not even consider nursing and other allied health professions due to cultural and economic factors. Al-Umran in her recent 1981 doctoral dissertation concluded that the number of nursing candidates increased significantly due to an appropriate and effective media campaign in Bahrain (Al-Umran, 1981, Appendix A).

In summary, the issue of admission is of paramount importance for the CHS programs not only for the purpose of increasing the applicant pool but also for attracting the appropriate candidates.

A. Statement of the Problem

The purpose of this study was to investigate the following problems:

Are the existing admission criteria used by the College of Health Sciences effective in selecting candidates who will perform successfully in the academic programs?

Are the exams which are administered as part of the selection process useful in providing valid data regarding the applicant's academic and non-academic background pertinent to their future role?

1. Hypotheses

This study was aimed at investigating the following hypotheses:

a. The College English Entrance Examination is a significant contributor to the prediction of the students' future academic performance.

b. The College Science Entrance Examination is a strong predictor of students' performance in the College.

c. The Tawjehie (High School Certification Exam) is an effective instrument in predicting future academic achievement.

d. The College Aptitude test is not a significant measure in predicting students' academic performance.

B. Significance of the Study

The results of this study will be significant to the College of Health Sciences in Bahrain and to other similar institutions in that Region. The resulting data of this study will provide specific

guidelines on the nature of future admission policies in the CHS. The study may also influence a move towards standardizing the entrance examinations and measuring their reliability and validity. It may also lead to some changes in recruitment policies and help attract applicants with educational backgrounds which are appropriate to the future role of CHS graduates.

Since there are many similarities between Bahrain and other Middle Eastern countries especially in the areas of health needs and services, the findings of this study could be generalized and applied to other allied health institutions in that part of the world.

C. Limitations of the Study

This study examined the academic achievement of students who were admitted to the College of Health Sciences from 1978 to 1980. It was not intended to evaluate the training programs themselves nor was it aimed at examining the effectiveness of the teaching process on the college or high school levels.

Furthermore, this study only reviewed test data on academic performance and did not address itself to the quality and nature of performance after graduation.

D. Definition of Terms

1. Tawjehie

The High School Certification Exam administered to all students prior to graduating from high school.

2. Common Core Curriculum

This curriculum includes educational contents common to, and required by, all the different training programs. It usually

involves the first two terms of the first academic year in the college.

3. Academic Achievement

Academic grades assigned by teachers on tests.

4. Regression Coefficient

A general statistical technique through which one can analyze the relationships between a set of dependent and independent or predictor variables.

II. LITERATURE REVIEW

The purpose of this literature review is to describe the current student selection and admission procedures in allied health and nursing schools. Allied health schools are increasingly being held accountable for the process of student selection and are required to document specifically the criteria by which the decisions are made.

In many countries, the number of applicants seeking training in health professions exceeds the number of places available in training programs (Maynard et al., 1974; Katzell, 1977; Bennett et al., 1980, Appendix A). This has led institutions to attempt to identify the most "suitable" applicants. The "suitable" students are those who graduate, achieve local standards of competence and meet the clinical and professional standards established by the profession. Therefore, selection committees desire not only to predict the applicants' performance in the training program but also their on-the-job performance. This seems to be a rational practice instead of selecting students at random, given that there is a relationship between the qualities of the entrants and the training process. For example, if applicants to a nurses' training program can be selected on the basis of attaining a specified level of knowledge in human biology, the program can be designed accordingly. Therefore, entrants selected have a substantial effect upon many aspects of the program.

Another fact that reinforces the need for selective admission is that entrant qualities also affect the outcome of the training

program. Some of the personal attributes brought into the program will be retained upon completion of the program. Thus, the nature of the graduate and hence the health services are to some extent determined by the selection process.

Furthermore, if all selected students undertake and complete the training, then go on to be dedicated and diligent health workers throughout their professional lifetime, one would say that the selection process is maximally effective. But since such a situation rarely occurs and the cost of training is continuously rising, there is the consequent concern of not wasting places and being selective in admitting students (Maynard et al., 1974; Katzell, 1977).

The most common and traditional measures used by the majority of the admission committees in allied health and nursing schools in this country to aid them in identifying the suitable applicants can be considered under three main categories:

- Measures of academic achievement,

- Measures of non-academic achievement,

- Measures of background, work and other experiences.

Each of these categories will be examined in terms of their effectiveness in predicting success both in the professional school and later on the job.

A. Measures of Academic Achievement

Traditionally, the most common measures used in the selection of students for training in the health care professions have been measures of academic achievement. This includes the combination of all or several of the following indices:

- Grade point average (GPA)
- Specific course grades (chemistry, biology, etc.)
- Grade pattern in high school
- Rank in high school graduating class
- ACT, SAT and other aptitude and achievement test scores.

Most allied health and nursing institutions, whether hospital or university based, use the grade point average when screening applicants to their programs. The great attraction to this and other measures of academic achievement is that the data are almost always readily available. Paradoxically, their ready availability is also one of their main drawbacks. Most admission committees concentrate upon them to the exclusion of other valid measures. Further reinforcing their popular use is that they are considered fair because they are produced outside of the training institution. The applicants know that they have to achieve a certain level in school examinations and achievement tests in order to be admitted to a training program. Unfortunately, these measures could also be unfair. For example, in many countries, schools in rural areas are less equipped and staffed than their urban counterparts. In turn, students with similar abilities from the two types of schools will achieve different scores on exams.

Success in most allied health and nursing schools has been measured by the cumulative GPA, performance on State Board Examinations, performance on the job and attrition.

1. Cumulative GPA

Studies have shown that the pre-professional GPA is the single most reliable predictor of academic success, i.e., cumulative

GPA in allied health and nursing schools (Williams, 1963; Seither, 1980).

SAT, ACT and other aptitude and achievement test scores do not contribute much to the prediction of academic success in nursing schools and not at all to the clinical performance of the students (Lewis and Welch, 1957; Chissom, 1975; Yess, 1980). Wallach (1976) observed that when the SAT scores were the rule by which admission decisions were implemented with a random sample of applicants to 45 colleges in the United States, the consequences were very discriminatory: all nonwhite applicants would be turned down. But when basing the admission decisions on accomplishments, nonwhite candidates would be accepted in almost the same proportion as their incidence in the applicant population.

Other researchers maintain that the achievement, aptitude and other similar tests are significantly correlated with academic success in nursing schools (Taylor, 1967; Abdellah, 1970; Fincher, 1974). Yess (1980) found the SAT math score to be the single most important predictor of success in community nursing colleges. Since a mathematical aptitude reflects the ability to analyze, interpret and apply data, this is not a surprising finding.

2. Performance on State Board Examinations

Muhlenkamp (1971) provides evidence that the GPA at the end of the seventh semester in nursing school is the best predictor of performance on state board scores. Perez (1977) points out that the best predictor of performance on state boards is the GPA at the end of the freshman year.

3. Attrition

Statistics reveal that 33 percent of students entering nursing school do not graduate with the majority dropping out during the first year (Sherman, 1978). Students who dropped out voluntarily are not academically inferior to those who graduated. On the other hand, those who were expelled tended to have lower scores in high school courses and scientific achievement tests (Baker, 1975).

4. On-the-Job Performance

On-the-job performance is logically the most important indicator of success. This is usually measured through ratings by supervisors. Interestingly enough, while the GPA of theory courses and achievement tests did not relate to on-the-job ratings, grades from clinical courses were related significantly (Brandt, 1968; Saffer et al., 1972; Dubs, 1975; Seither; 1980).

From all of these studies, the conclusion is that measures of academic achievement (GPA, ACT, SAT scores, science grades, etc.) seem to be the best predictors of future academic performance but not clinical performance.

5. The Allied Health Programs Admissions Test

In an attempt to resolve many of the selection problems, some schools of allied health use what has to come to be known as the Allied Health Programs Admission Test (AHPAT). In 1972 the Psychological Corporation was able to collect information from various allied health schools in the United States which indicated an interest in the development of a standardized allied health test to be utilized in the process of selecting students for upper division allied health

programs. Psychometric personnel from the Psychological Corporation, their consultants and content experts proposed several hundred questions which were administered as a pretest to students entering upper division allied health schools in three major universities during the fall of 1973. Based on the results of an item analysis which followed, questions were selected for the first AHPAT form, taking into consideration each item's difficulty and discrimination indexes.

The selected questions were designed to measure verbal ability, quantitative ability, reading skills, knowledge of biology and chemistry fundamentals. The test was written for students at the college sophomore level from where most of the students would be drawn. At that time, there was no consensus among the developers as to whether there was a need to measure achievement in the behavioral sciences.

Thus the first form of the AHPAT with its subsequent revisions included the following content areas:

a. Verbal Ability: index of word knowledge, breadth and strength of nontechnical vocabulary; also indicates general ability to handle college-level studies. There were 75 questions in this category (Katzell, 1977).

b. Quantitative Ability: measure of ability to reason through and understand quantitative concepts and relationships, including basic arithmetic processes; with Verbal Ability, also measures general academic aptitude. There were 50 questions in this category (Katzell, 1977).

c. Biology: indicates knowledge of principles and concepts of basic college level biology, with major emphasis on human biology. There were 50 questions in this area (Katzell, 1977).

d. Chemistry: deals with principles and problems in elementary organic and inorganic chemistry at the college level. There were 50 questions in this category (Katzell, 1977).

e. Reading Comprehension: expresses ability to read and understand content of passages from the natural and social sciences written in college level textbook style. There were 45 questions in this category (Katzell, 1977). All of the questions were in a multiple choice format.

Norms for the AHPAT were established based on the performance of the enrolled students on the test in 1974, who entered 17 different allied health programs. Hence, they were based on the scores of the general population enrolled in the programs rather than on the performance of the applicants. Later on, norms were developed based on the performance of the enrolled applicants in medical technology and physical therapy, etc. As the number of entrants in each program grew to insure valid and reliable statistics, such norms were developed.

6. Reliability of the AHPAT

Using the Kuder-Richardson 20 Formula, the reliability coefficients for the five sections of the AHPAT were measured and found to range between 0.91 and 0.83 (Katzell, 1977). This indicates satisfactory consistency and hence reliability.

7. Validity of the AHPAT

The developers of the AHPAT intended that this test be able to discriminate between the students who are more likely to succeed, and those who will fail the program. There have been follow-up studies on the students who have taken the AHPAT. Katzell (1977) found that

correlations between AHPAT results and first year GPA range between 0.31 and 0.84. When the correlation between preprofessional GPA and allied health GPA exceeded 0.60, the AHPAT score did not contribute significantly to the prediction of success, but AHPAT did have a prediction ability when the correlation was less than 0.60 (Katzell, 1977).

Further reinforcing the validity of the AHPAT is that the mean AHPAT scores were considerably lower for those who failed due to academic reasons, than for those who completed the program successfully (Katzell, 1977). Katzell also pointed out that the mean of the AHPAT scores for the nonacademic dropouts was very similar to that of the students who completed the programs. Therefore, based on Katzell's findings, the AHPAT is able to provide the examiners with comparable and relevant information about students from different backgrounds.

In 1976 a study was done to determine the strengths of the five subscores on the ACT, the GPA accumulated prior to admittance to the allied health program, and the five subscores on the AHPAT. It also measured their ability to predict academic success using the first year GPA in the allied health programs. The sample was comprised of occupational therapy students, physical therapy students and a combination of students from other small divisions of allied health programs at Ohio State. Results indicated that when ACT scores were available, their subscores and the preprofessional GPA were stronger variables in predicting success than the AHPAT scores. When the ACT scores were not available, the preprofessional GPA was

the best single predictor especially for the occupation therapy students. Thus preprofessional GPA was in the highest position in terms of its ability to predict future performance both in the single and multiple correlations. The same study indicated that the ACT subscores were more effective as single predictors than the AHPAT scores. (Schimpfhauser and Broski, 1976). Thus Schimpfhauser and Broski's major findings are:

- a. The strongest variable in predicting the first-year grades in the allied health program is generally the preprofessional GPA.
- b. American College Testing (ACT) scores when available along with preprofessional grades served as better contributors to predicting future success than did the AHPAT scores.
- c. AHPAT did replace ACT scores (when not available) as significant predictors but did not contribute to the extent the preprofessional grades do.

Therefore, based on these findings, Ohio State University decided to discontinue the AHPAT as an admission requirement.

It is clear from the literature that there are differences on the usefulness of the AHPAT. Leiken (1980) attempted to reconcile these differences. He confirmed the presence of a significant correlation between the AHPAT score and professional GPA. Furthermore, when AHPAT was rejected by previous research, it was not due to failings of the test itself but because the AHPAT added little to the information obtained from the GPA and ACT (Leiken et al., 1980).

Researchers continue to explore additional educational measures and not rely solely on the AHPAT.

B. Measures of Non-Academic Achievement

Many allied health and nursing institutions are adopting a multi-variate approach for student selection, of which one is the interview. Often, interviews are discredited because they are notoriously unreliable and subjective (Burton, 1977). Some studies have rejected this device as valid and found it ineffective for student selection (Kelley, 1957; Gough et al., 1964; Richards, 1974). Fear (1976) enumerates guidelines for interviewers to turn the interview into a systematic process. He develops different profiles of jobs describing the traits and characteristics which different professionals should have. The major fault with his theory is that none of the traits he proposes are based on data acquired from research. The outcomes of interviews would be more successful if the interviewers underwent some training in the principles of interviewing and the more structured the interview, the better the results (Carlson et al., 1971). Shuh (1971) confirmed Carlson's findings and added that if the interviewer was familiar with the profession he was interviewing for, the interrater reliability would increase.

Shepard (1980) enumerates five reasons why traditional selection interviews fail to predict future success. First, interviews are usually correlated with inappropriate end measurements such as the GPA and scores on standardized tests, and usually there is no significant correlation. Interviews measure humanism while the GPA and other similar variables measure cognitive achievement.

Secondly, Shepard found that most of the interview scales used are limited to a four-point range: excellent, good, fair and poor.

Based on this scale, the only candidate who will be accepted into a highly competitive program is a person who achieves an excellent or good rating. Therefore, researchers only have a two-point range to use for validity correlation. By increasing the rating scale from a seven to ten-point scale, there could be further discrimination among applicants by yielding at least a four-point spread among those accepted, thus producing higher validity correlations. Interview error may occur while rating the applicants. The term encompasses a number of individual problems: prejudices, stereotyping, rating towards the mean, use of unsystematic and suggestive questioning, the halo effect and the erroneous belief in first impressions (Zubin, 1957).

Finally, traditional interviews are usually conducted one-to-one which is an effective format for obtaining information about outside interests, cognitive skills, sincerity and motivation. But it is difficult through this method to determine the applicant's ability to interact and communicate in an acceptable manner in small group situations which often occur in health care settings.

There has been a prevalent form for group interviews. It requires more than one interviewer, usually including one or more students. It has been found that this format yields more satisfactory results than the one-to-one format. The group format is more reflective of interactions in health care settings: meeting new people, spontaneous problem solving, communicating effectively, taking responsibility for one's statements, listening carefully and making sincere and relevant remarks (Fong and Leton, 1978; Shepard, 1980).

Shepard (1980) conducted a study in which she attempted to identify both the content and process variables that are present in group interviews and their effect on final ratings. The first hypothesis which she failed to support with data was that

"the more similar an interviewee is to an interviewer, the more likely an assessment favorable to the interviewee will result."

The second hypothesis stated that the higher the status of the interviewer in the institution, the more influence he/she will have on determining the final interview ratings. Her study revealed the presence of a variable other than the status variable which affected the final group score. It is the variable she identified as "talk": the more an interviewer talked and shared with the remaining faculty members information regarding the candidate, the greater his/her impact on the final score.

In conclusion, the group interview if appropriately structured can be effective in providing opportunities to evaluate an applicant's motivation towards the profession, interpersonal ability and communication skills.

C. Measures of Background, Work and Other Experiences

1. Letters of Recommendation

Many of the allied health and nursing schools require letters of recommendation from their applicants. Some schools have prepared forms while others do not. Usually, three letters are required: one from a faculty member, a peer and an employer. Athelston (1974, Appendix A) found that letters of recommendation have little value to admission committees unless the recommendations are negative which

does not occur often. Stronck (1979) found that letters of recommendation were ineffective predictors of future performance, especially since the enactment of the new law on disclosure of confidential files has tended to reduce the frankness of letters. Furthermore, there is always the possibility that selection committees are tempted to weigh the value of the letters on the basis of the rank and title of the author rather than the applicant's qualities. Therefore, if letters of recommendation are used when selecting students, they should not be the only criteria used.

2. Work and Other Relevant Experiences

Athelston (1974, Appendix A) maintains there is a high positive correlation between previous job experiences related to the profession and satisfactory performance in the program. On the other hand, Yess (1980) found that a previous related job experience, such as in practical nursing was the least important predictor of community college cumulative GPA in nursing. Therefore, the literature reveals that there is no agreement among the researchers regarding the importance of related previous jobs to subsequent success in school.

D. Summary

Since there have not been any recorded studies on admission criteria in any of Bahrain's institutions, it was necessary to examine the literature concerning the selection process of United States institutions. The majority of admission committees in allied health and nursing schools in the United States use measures of academic and non-academic achievement in screening applicants to their programs. Measures of academic achievement tend to be the most commonly used

with preprofessional grades being the most successful in predicting future academic success. The literature shows that there was no agreement on the significance of aptitude and achievement tests as predictors of future academic performance. Some researchers found the SAT, ACT and other similar tests to be significant contributors while others did not. But there is a consensus that measures of academic achievement do not seem to predict clinical performance. Neither interview results nor personal characteristics are effective in predicting future performance. Thus it is apparent from the literature that the best predictors of future academic performance are measures of past and current academic achievement.

III. METHODOLOGY

The purpose of this study was to examine the effectiveness of the admission criteria employed by the College of Health Sciences from 1978 to 1980, in predicting future academic achievement in the College. An attempt was made to review the existing system of admission procedures and to analyze the relationship of admission tests with the performance on various academic tests by the CHS students. The following is a description of the current admission policies, procedures and various tests used by the CHS as well as the methods employed to analyze the hypotheses of this study.

A. System of Admission

The entrance requirements have changed periodically over the last four years. Table I gives an overview of the additions as well as the deletions of various procedures during the last four years. Table II shows the number of students admitted and graduated in the period between 1976 and 1980.

The only admission criteria for applicants in 1976 was to pass the Tawjehie (High School Certification Examination) of the Ministry of Education with emphasis on its subscores in English and Science. There was little or no screening involved and 140 students were admitted and only 45 graduated from the class of 1976. It is the process of selection based on college examinations and the ability to cope with studying in English that took a toll of many students.

An interview of the candidates became a requirement along with a passing grade in the Tawjehie in 1977. Each applicant received

TABLE I
CHANGES IN ADMISSION PROCEDURES (1976-1980)

Entrance Requirements	Year				
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
<u>Tawjehie</u> Exam (total score)	x	x	x	x	x
Interview Score		x			
College English Entrance Exam			x	x	x
College Science Entrance Exam			x	x	x
College Aptitude Test				x	x

TABLE II
NUMBER OF STUDENTS ADMITTED AND GRADUATED 1976 - 1980

Year	Admitted	End of Year 1	Graduated
1980	187	149	^a
1979	205	163	86
1978	162	142	80
1977	143	92	33
1976	140	90	45
TOTAL	837	636	244

^a This class will graduate in July, 1982.

a score on the interview. There were 143 students admitted and only 33 graduated.

During 1978, 162 students were admitted and 80 graduated. The applicants sat for the college entrance examinations in English and Science. Applicants with the highest scores on these two examinations and the Tawjehie were selected.

This process was further expanded in 1979. During this year, an aptitude test was administered. It was decided by the admission committee that the interview was not functioning as an effective selection tool. The scores from the four examinations were averaged according to the following percentages which were decided upon by the admission committee (Table III). There is no documentation how the decisions concerning these percentages were made. During this year, 162 students were admitted and 80 graduated.

TABLE III
PERCENTAGES GIVEN TO THE ENTRANCE EXAMINATIONS IN 1979

Entrance Examinations	Percentages
<u>Tawjehie</u>	30%
College English Entrance Exam	20%
College Science Entrance Exam	30%
College Aptitude Test	20%

The entrance tests remained the same in 1980 for the 187 admitted with some changes in the percentages given to each score because the admission committee felt that the first three examinations were more important than the aptitude test. Table IV provides the percentages given to each exam.

TABLE IV
PERCENTAGES GIVEN TO THE ENTRANCE EXAMINATIONS IN 1980

Entrance Exam	Weight
<u>Tawjehie</u>	30%
College English Entrance Exam	30%
College Science Entrance Exam	30%
College Aptitude Test	20%

B. Definition of Instruments

Applicants to the CHS take a number of entrance examinations in addition to taking the Tawjehie. All of these examinations are developed locally with the intention that the instruments will be sufficient indicators of the applicants' academic abilities. The instruments are described as follows. The Tawjehie is an examination administered to all students upon completion of the public high school program. It is a standardized examination and is developed by educational experts in the Ministry of Education, Bahrain. The examination is a combination of objective and essay test items on various subjects

such as chemistry, physics, biology, math, English, and Arabic. The Ministry officials believe that the exam is valid and reliable but have not presented data to support this fact.

The College English Entrance Examination administered by the CHS was developed by the English Department in the College. It measures the applicants ability to comprehend and construct sentences. It is a fixed answer test, usually made up of multiple-choice questions. The validity and reliability of this test have not been measured. The maximum time allowed for answering the test is two hours. The content of this examination has remained fairly constant.

The College Science Entrance Examination is also administered by the CHS and is developed by the Life and General Sciences Departments in the College. The examination measures the applicant's knowledge and comprehension of simple and basic concepts in chemistry, physics and biology as related to health. This is a multiple choice test. It requires a maximum time of two hours to complete the examination. The test is written in Arabic and its validity and reliability have not been determined. Its content has remained constant.

The College Aptitude Test was developed by the Education Unit in the College. It is adapted from the SAT test used in the United States. The test attempts to measure the applicants' ability to make simple and complex decisions.

Group interviews were used in 1977 with three faculty members and only one student. In 1978, it became a one-to-one interview. The interviewers intended to find out about the applicant's level of maturity, interests, goals and reasons for applying to the CHS.

Each received an interview score ranging from zero to 100 based on the interviewers' professional judgement. But documentation on how the interviews were developed was not available.

C. Sample

The total sample in this study was comprised of all students admitted to the College from 1978 to 1980 who had at least completed one term in the college (N = 454). Their distribution is shown in Table V.

The distribution among the six programs at time of graduation is shown in Table VI.

D. Research Hypotheses

This study intended to examine the following hypotheses:

1. The College English Entrance Examination is a significant contributor to the prediction of the students' future academic performance.
2. The College Science Entrance Examination is a strong predictor of students' academic achievement in college.
3. The Tawjehie (High School Certification Examination) is an effective instrument in predicting future academic success.
4. The College Aptitude Test is not significant in predicting students' future academic performance.

E. Data Analysis

In order to test the four hypotheses, independent (predictor) and dependent (criterion) variables were identified for specific data analysis. The following admission criteria were labelled as the four independent variables:

TABLE V

DISTRIBUTION OF STUDENTS IN THE SAMPLE EACH YEAR

Year	Droupouts After Completing 1-3 Terms	Continuing Students	Total
1980	58	91	149
1979	77	86	163
1978	62	80	142
Total	197	257	454

TABLE VI

NUMBER OF GRADUATING STUDENTS FROM THE SIX PROGRAMS

Year	Nursing	Laboratory	Pharmacy	Public Health	Radio- graphy	Medical Equipment	Total
1980	33	15	14	14	13	2	91
1979	21	20	17	12	11	5	86
1978	20	14	15	11	9	10	80
Total	76	49	46	37	33	17	257

1. Tawjehie score,
2. College English Entrance Examination,
3. College Science Entrance Examination,
4. College Aptitude Test.

The outcome of performance on the first-year examination and specialized examinations were labelled as the dependent variables. More specifically, the following tests were the dependent variables:

1. The cumulative average score at the end of the first-year for all students enrolled in the six programs from 1978 to 1980.
2. The second-year averages for the Nursing, Medical Laboratory and Pharmacy students in 1978 and 1979.

The stepwise regression analysis was used to study prediction. In this method, at each step, one predictor is added to the regression equation. In this analysis, only those variables which met the 0.05 significance level ($p < .05$) were entered in the model. The first variable selected was the one which removed the maximum amount of residual variability from the dependent variable. Therefore, variables were selected in the order in which they contributed to the prediction of the dependent variable. An index of multiple correlation, the regression coefficient (R) was provided to show their effect. The square of these coefficients (R -square), indicates the extent to which the variance in the dependent variable can be accounted for by a number of independent variables when optimally weighted. For example, a multiple correlation of 0.40 can be interpreted as the index for the combination of predictor variables which account for 16 percent of the variance. In other words, the variables contributed by 16 percent in effectively predicting the dependent variable.

This analysis was performed on an IBM 370 computer using the statistical package, Statistical Analysis System (SAS).

IV. RESULTS

The sample in this study was made up of 453 students who entered the College of Health Sciences in 1978 (N = 142); 1979, (N = 163) and 1980 (N = 149). Their preadmission data comprised the four independent variables, which were analyzed to see how well they predicted the cumulative grades at the end of the common core and the cumulative grades at the end of the second-year for the Nursing, Medical Laboratory and Pharmacy Programs.

Table VII lists the means and standard deviations of the independent (predictor) and dependent (criterion) variables for all six programs in 1978, 1979 and 1980. The highest means, except for the College Aptitude Test, were obtained by students who entered the Pharmacy Program.

Tables VIII, IX and X contain the means and standard deviations of the independent and dependent variables for the students who dropped out of the programs at various stages of their study in 1978, 1979 and 1980 respectively and for the continuing students. Generally, the mean scores of those who continued were higher than those who dropped out. To determine whether these differences are significant, t-tests were performed comparing the mean scores of the continuing students and dropouts before term one on each of the four admissions criteria. This group of dropouts was specifically selected since they did not manage to complete even one term of the program.

The results appear in Tables XI, XII, XIII and XIV along with the means and standard deviations for the dropouts and continuing

TABLE VII

MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR
AND CRITERION VARIABLES BY PROGRAM AREAS

PROGRAMS VARIABLES	Nursing		Medical Laboratory		Pharmacy		Public Health		Radiography		Medical Equipment	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
	N = 76		N = 49		N = 46		N = 37		N = 33		N = 17	
First Year Cumulative Score	70.51	7.15	73.34	5.25	78.28	5.78	70.95	6.63	65.97	5.23	70.77	5.45
<u>Tawjehie</u>	59.12	7.97	58.63	6.45	62.67	7.80	57.51	6.05	56.97	7.09	59.47	7.01
College English Entrance Exam ination	53.20	13.70	55.69	14.54	59.30	15.85	53.95	13.62	52.00	15.59	45.94	19.89
College Science Entrance Exam- ination	55.71	11.29	58.45	8.94	63.07	8.37	56.05	9.17	53.52	9.92	55.71	7.89
College Aptitude Test	69.48	12.59	66.06	14.55	68.35	16.23	62.68	17.93	62.18	13.65	65.18	15.19

TABLE VIII

MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND CRITERION
VARIABLES FOR DROPOUTS AND CONTINUING STUDENTS IN 1978

VARIABLES	Dropouts Before Term 1			Dropouts After Term 1			Dropouts After Term 2			Dropouts After Term 3			CONTINUING STUDENT		
	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.
<u>Tawjehie</u>	20			16			30			10			80		
College English Entrance Exam- ination	54	4.3		56	5.3		56	6.3		60	8.8		59	7.7	
College Science Entrance Exam- ination	40	11.6		41	11.7		37	10.7		49	13.1		47	13.8	
College Aptitude Test	44	9.8		52	10.0		46	9.4		55	14.3		55	13.5	
Term 1	60	6.4		65	7.9		67	8.2		65	4.3		58	14.4	
Term 2	-	-		40	15.3		57	15.0		71	11.0		74	8.7	
Term 3	-	-		-	-		39	10.6		57	8.6		71	9.5	
First Year Cumulative Score	-	-		-	-		-	-		43	12.0		71	7.6	
	-	-		-	-		-	-		57	8.0		72	7.8	

TABLE IX

MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND CRITERION
VARIABLES FOR DROPOUTS AND CONTINUING STUDENTS IN 1979

VARIABLES	Dropouts Before Term 1			Dropouts After Term 1			Dropouts After Term 2			Dropouts After Term 3			CONTINUING STUDENT		
	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.
<u>Tawjehie</u>	44			20			41			16			86		
College English Entrance Exam- ination	58	2.6		57	7.1		58	5.0		60	9.3		60	7.0	
College Science Entrance Exam- ination	50	15.9		51	11.0		53	13.0		49	13.0		57	14.3	
College Aptitude Test	55	5.1		53	8.4		57	10.3		53	7.0		60	9.0	
Term 1	62	18.0		68	16.0		65	14.2		67	18.0		69	18.0	
Term 2	-	-		40	16.0		63	10.1		66	10.0		75	7.2	
Term 3	-	-		-	-		49	9.0		59	5.0		71	6.4	
First Year Cumulative Score	-	-		-	-		-	-		43	6.0		69	5.0	
	-	-		-	-		-	-		56	6.0		72	6.0	

TABLE X

MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND CRITERION
VARIABLES FOR DROPOUTS AND CONTINUING STUDENTS IN 1980

VARIABLES	Dropouts Before Term 1			Dropouts After Term 1			Dropouts After Term 2			Dropouts After Term 3			CONTINUING STUDENT		
	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.	N.	Mean	S.D.
<u>Iawjehie</u>	38			28			30			-			91		
College English Entrance Exam- ination	64	8.0		61	10.2		59	7.0					60	7.4	
College Science Entrance Exam- ination	53	21.0		54	13.2		51	14.3					58	15.0	
College Aptitude Test	55	8.5		53	8.2		56	8.4					56	11.0	
Term 1	65	17.5		65	18.0		68	11.2					72	13.2	
Term 2	-	-		52	21.0		63	7.4					75	12.0	
Term 3	-	-		-	-		53	17.3					71	9.2	
First Year Cumulative Score	-	-		-	-		-	-					73	8.4	
	-	-		-	-		-	-					73	8.8	

students for the Tawjehie, College English Entrance Examination, College Science Entrance Examination and College Aptitude Test respectively.

The Tawjehie mean of the continuing students in 1978 was significantly higher than for the dropouts. On the other hand, the difference between the two groups on this variable in 1979 was not significant. Interestingly enough, the Tawjehie mean for the dropouts in 1980 was significantly higher than for the continuing students (Table XI).

In 1978 and 1979, the mean score on the College English Entrance Examination for the continuing students was significantly higher than for the dropouts, but the differences were not significant in 1980. (Table XII)

Similarly, the 1978 and 1979 continuing students did significantly better on the College Science Entrance Examination but there were no significant differences between the 1980 groups. (Table XIII)

The results in Table XIV show that the College Aptitude Test mean of the 1978 dropouts was significantly higher than for the continuing students. In the 1979 group, the differences were not significant, and in 1980 the continuing group did significantly better.

The means and standard deviations for the second-year cumulative score for the Nursing, Medical Laboratory and Pharmacy students entering in 1978 and 1979 are found in Table XV. The number of students in the Public Health, Radiography and Medical Equipment Maintenance is not high enough to produce significantly reliable results. Thus, this segment of the analysis was limited to the Nursing, Medical Laboratory and Pharmacy Programs in 1978 and 1979 only. The 1980

TABLE XI

TAWJEHIE MEAN, STANDARD DEVIATION AND T-TEST VALUES OF THE CONTINUING STUDENTS AND DROPOUTS BEFORE TERM 1 FOR ALL THE PROGRAMS COMBINED IN 1978, 1979 AND 1980

	1978		1979		1980	
	Continuing	Dropouts	Continuing	Dropouts	Continuing	Dropouts
Number of Students	80	20	86	44	91	38
Mean	58.68	54.15	58.56	58.41	60.17	64.36
Standard Deviation	7.89	4.38	6.83	6.16	7.43	7.54
T-test Value	3.429*		0.1310		-2.9077*	

* p < .05

TABLE XII

THE COLLEGE ENGLISH ENTRANCE EXAMINATION'S MEAN, STANDARD DEVIATION
AND T-TEST VALUES OF THE CONTINUING STUDENTS AND DROPOUTS BEFORE
TERM 1 FOR ALL THE PROGRAMS COMBINED IN 1978, 1979 AND 1980

	1978		1979		1980	
	Continuing	Dropouts	Continuing	Dropouts	Continuing	Dropouts
Number of Students	80	20	86	44	91	38
Mean	47.65	39.83	56.48	49.52	57.85	53.18
Standard Deviation	13.83	11.92	14.41	16.03	15.27	20.74
T-test Value	2.340*		2.5094*			1.2539

* $p < .05$

TABLE XIII

THE COLLEGE SCIENCE ENTRANCE EXAMINATION'S MEAN, STANDARD DEVIATION AND T-TEST
VALUES OF THE CONTINUING STUDENTS AND DROPOUTS BEFORE TERM 1 FOR ALL THE
PROGRAMS COMBINED IN 1978, 1979 AND 1980

	1978		1979		1980	
	Continuing	Dropouts	Continuing	Dropouts	Continuing	Dropouts
Number of Students	80	20	86	44	91	38
Mean	54.86	43.45	60.94	55.18	56.04	55.28
Standard Deviation	11.35	9.47	9.64	11.03	8.25	8.79
T-test Value	4.1410 [*]		3.0677 [*]		0.4641	

* p < .05

TABLE XIV

THE COLLEGE APTITUDE TEST'S MEAN, STANDARD DEVIATION AND T-TEST VALUES OF THE CONTINUING STUDENTS AND DROPOUTS BEFORE TERM 1 FOR ALL THE PROGRAMS COMBINED IN 1978, 1979 AND 1980

	1978		1979		1980	
	Continuing	Dropouts	Continuing	Dropouts	Continuing	Dropouts
Number of Students	80	20	86	44	91	38
Mean	58.01	62.40	68.31	62.31	71.91	64.47
Standard Deviation	62.40	6.05	16.16	18.21	13.29	15.70
T-test Value	-2.355*		1.9167		2.7431*	

* $p < .05$

group was not included because this group will not have a second year cumulative score until the summer of 1982.

TABLE XV
MEANS AND STANDARD DEVIATIONS OF THE SECOND-YEAR CUMULATIVE
AVERAGE FOR THE NURSING, MEDICAL LABORATORY AND PHARMACY
PROGRAMS IN 1978 AND 1979

Programs	Second Year Cumulative Score	
	Mean	Standard Deviation
Nursing N = 41	75.44	6.44
Medical Labortory N = 34	58.27	6.85
Pharmacy N = 32	74.59	6.36

Table XVI presents the means and standard deviations for the dependent and independent variables for the six programs combined in 1978, 1979, and 1980.

The highest mean scores on all the variables except for the College Science Entrance Examination were obtained from the 1980 group with the lowest obtained by the 1978 group.

Multiple regression analysis was used to determine what percentage of the variance in the criterion score was accounted for by the predictor variables.

TABLE XVI

MEANS AND STANDARD DEVIATIONS OF THE PREDICTOR AND
CRITERION VARIABLES FOR ALL PROGRAMS COMBINED
IN 1978, 1979 AND 1980

Variables	All Programs Combined In 1978 (N = 142)		All Programs Combined In 1979 Nn = 163)		All Programs Combined In 1980 (N = 149)	
	Mean	S. D.	Mean	S. D.	Mean	S. D.
First-year Cumulative Score	61.96	15.68	62.49	13.37	65.79	14.26
<u>Tawjehie</u>	57.90	7.48	58.45	6.75	60.01	7.91
College English En- trance Exam- ination	44.76	13.59	54.09	13.84	55.74	14.84
College Science En- trance exam- ination	52.48	11.72	58.20	9.96	55.42	8.39
College Aptitude Test	61.43	10.51	66.76	16.23	69.73	14.14

Tables XVII, XVIII and XIX list in descending order those independent (predictor) variables which contributed significantly to the prediction of first-year cumulative average. The results by programs appear in Table XVII. The strongest predictor variable was the College English Entrance Examination for all student subgroups except for Pharmacy where the Tawjehie prevailed. This is not a

surprising finding since the courses in the CHS are taught in English and this would be the first time that the students studied subjects in this language.

TABLE XVII

COMBINATION OF MEASURES WHICH PROVIDE SIGNIFICANT PREDICTION OF FIRST YEAR CUMULATIVE AVERAGE FOR ALL ENTERING STUDENTS IN 1978, 1979 AND 1980 IN THE ORDER OF THEIR PREDICTIVE CONTRIBUTION

Program	N	Predictor Variable	R-Square
Nursing	74	College English Examination	0.2933
		College Science Examination	0.3097
		<u>Tawjehie</u>	0.4444
Medical Laboratory	49	College English Examination	0.2144
Pharmacy	46	<u>Tawjehie</u>	0.5355
		College Science Examination	0.6038
		College English Examination	0.6537
		College Aptitude Test	0.6859

In the Nursing Program, the College English Entrance Examination explained 29 percent of the variance while it only explained 21 percent in the Medical Laboratory Program. The College Science Entrance Examination and Tawjehie also met the 0.05 significance level in the Nursing Program with the final explained variance being 44 percent. In the Pharmacy program, all four independent (predictor) variables met the specified significance level and accounted for almost 69

percent of the variance in the first-year cumulative grades. In the Medical Laboratory Program, the College Entrance Examination was the only significant predictor.

When the data records of students entering the six programs in 1978 were combined, the College English Entrance Examination was again the strongest predictor followed by the College Aptitude Test, College Science Entrance Examination and Tawjehie respectively. Together they accounted for approximately 38 percent of the variance. The College Science Entrance Examination was the best predictor in the 1979 group, followed by the College English Entrance Examination only. Together they accounted for approximately 19 percent of the variance. For the combined programs in 1980, the best predictor of the first-year cumulative grades was the College English Entrance Examination. The second best predictor was the College Aptitude Test which was followed by the Tawjehie. These three variables accounted for 18 percent (Table XVIII).

Table XIX highlights the degree to which the significant variables contributed to the prediction of second year grades for the Nursing, Medical Laboratory and Pharmacy Programs.

As in the case of predicting first-year grades, the best variable for the Nursing Program was the College English Entrance Examination, but here it is followed by the College Science Entrance Examination only. These two variables accounted for 41 percent of the prediction. In the Medical Laboratory program, the College Aptitude Test was the best and only variable, explaining 25 percent of the variance. In the Pharmacy Program, the College Aptitude Test was again the

TABLE XVIII

COMBINATION OF MEASURES WHICH PROVIDE SIGNIFICANT PREDICTION OF FIRST YEAR CUMULATIVE AVERAGE FOR STUDENTS IN THE COMBINED PROGRAMS IN 1978 - 1980 IN THE ORDER OF THEIR PREDICTIVE CONTRIBUTION

Programs	N	Predictor Variables	R-Square
All programs combined in 1978 ^a	141	College English Entrance Examination College Aptitude Test <u>College Science Entrance Examination</u> <u>Tawjehie</u>	0.2088 0.3070 0.3582 0.3770
All programs combined in 1979 ^a	163	College Science Entrance Examination College English Entrance Examination	0.1235 0.1894
All programs combined in 1980 ^a	149	College English Entrance Examination College Aptitude Test <u>Tawjehie</u>	0.0958 0.1358 0.1879

^aIncludes Nursing, Medical Laboratory, Pharmacy, Public Health, Radiography and Medical Equipment Maintenance.

strongest predictor, alone accounting for 32 percent of the variance. The College Science and English Entrance Examinations were also significant predictors, making the final value of R-square 60 percent.

Summary of Results

Table XX presents a comparison of the prediction of first-and second-year grades by the four independent variables.

In predicting Nursing first-year grades, the Tawjehie, College English and Science Entrance Examinations were significant. In Medical Laboratory, the College English Examination was the only significant

TABLE XIX

COMBINATION OF MEASURES WHICH PROVIDE SIGNIFICANT PREDICTION OF SECOND-YEAR CUMULATIVE AVERAGE FOR THE NURSING, MEDICAL LABORATORY AND PHARMACY STUDENTS ENTERING IN 1978, 1979 AND 1980

Program	N	Predictor Variable	R-Square
Nursing	41	College English Entrance Examination	0.3111
		College Science Entrance Examination	0.4108
Medical Laboratory	34	College Aptitude Test	0.2345
Pharmacy	32	College Aptitude Test	0.3211
		College Science Entrance Examination	0.5305
		College English Entrance Examination	0.6008

variable in predicting first-year grades. On the other hand, all four variables met the significance level, in predicting first year grades for Pharmacy and the total student population in 1978. In 1979, the College English and Science Entrance Examinations were significant predictors. In 1980, the Tawjehie, College English Entrance Examination and the College Aptitude Test were the three significant predictor variables.

In predicting second-year grades of the students in the Pharmacy program, the College English, Science and Aptitude Examinations prevailed. The College English and Science Examinations were the two variables that met the significance level and in the Medical Laboratory Program, the College Aptitude Test was the only significant variable in predicting second-year grades.

TABLE XX

A SUMMARY OF THE PREDICTIVE SIGNIFICANCE OF THE TAWJEHIE, COLLEGE ENGLISH
ENTRANCE EXAMINATION, COLLEGE SCIENCE ENTRANCE EXAMINATION, COLLEGE
APTITUDE TEST TO FIRST- AND SECOND-YEAR GRADES BY STUDENT GROUPS

	Nursing	Medical Laboratory	Pharmacy	Total In 1978	Total In 1979	Total In 1980
To First-Year Cumulative Score:						
<u>Tawjehie</u>	X		X	X		X
College English Examination	X	X	X	X	X	X
College Science Examination	X		X	X	X	
College Aptitude Test			X	X		X
Explained Variance	44%	21%	69%	38%	19%	17%
To Second-Year Cumulative Score:						
<u>Tawhehie</u>						
College English Examination	X		X			
College Science Examination	X		X			
College Aptitude Test		X	X			
Explained Variance	41%	24%	60%			

In conclusion, the variance explained of the first-year criterion was generally higher than that of the explained variance of the second-year criterion except in Pharmacy. Although the differences between the two variances were not vast, more predictor variables were significant in predicting the first-year cumulative scores in Nursing, Medical Laboratory and Pharmacy than in the second-year cumulative scores in the same programs.

Of the four hypotheses investigated by this study, three were accepted. The first hypothesis stated that the College Entrance Examination is a significant contributor to the prediction of the students' future academic performance. Based on the data, this hypothesis is accepted. The second hypothesis stated that the College Science Entrance Examination is a strong predictor of the students' academic achievement in college. The data showed that this variable is a strong predictor in the Pharmacy Program. Therefore this hypothesis is accepted for this program only.

The third hypothesis investigated, was that the Tawjehie is an effective instrument in predicting future academic success. The data resulting from the statistical analysis did not support this statement and is therefore rejected.

The fourth hypothesis proposing that the College Aptitude Test is not significant in predicting students' academic performance is accepted on the basis of the data.

V. DISCUSSION AND CONCLUSIONS

The purpose of this study is to compare the relative predictive strengths of four variables used for admissions decision-making in the College of Health Sciences. The main concern was to determine the ability of these examinations to predict academic success in the College. The Tawjehie, one of the variables used, is a test that has been administered nationally by the Ministry of Education for many years, whereas the other three variables have a very short history of use. Of all the predictor variables, the Tawjehie is the only standardized examination and with established validity and reliability. Due to this fact and the relatively small sample size, one must be cautious in drawing conclusions.

The Tawjehie is administered at the end of high school and is, therefore, an index of academic performance while in high school. Since the literature maintains that the best index of future academic success is past academic performance, it probably would be more significant if the high school GPA is examined and not the Tawjehie which is only an exam. The Tawjehie was the best predictor in pharmacy only. Although in this program it accounted for 54 percent of the variance, it was expected to have strong predictive ability in other programs as well. When it was statistically significant it did add to the explained variance by 7, 2 and 3 percent in nursing, the 1978 and 1980 combined programs respectively. It did not surface as a significant predictor of second-year grades in any of the programs utilized in this study.

The Tawjehie score is a composite of several subscores. It is, therefore, possible that subscores in disciplines such as chemistry, physics, biology and mathematics would be more significant in predicting future achievement in the College's programs than the total score.

In summary, based on the presently available data from the regression equations and t-tests, the Tawjehie is not an effective predictor of academic performance in CHS.

The College English Entrance Examination was the strongest variable in predicting first-year grades for all student subgroups except Pharmacy where Tawjehie prevailed. When the complete student records for all six programs were combined, the College English Entrance Examination was again the strongest predictor in 1978 and 1980. For the 1979 group, it was the second best variable while in Pharmacy it ranked third. Finding the College English Entrance Examination to be the strongest predictor variable for four out of six equations was to be expected since the students are faced with studying courses in English for the first time. Although English is taught in high school, it is not the medium used to study other disciplines. Therefore, to succeed academically in the College, the student must be able to read, write and converse in the language of instruction.

Surprisingly, this examination was the strongest variable in predicting second-year grades in Nursing only. In Medical Laboratory, it did not meet the 0.05 significance level and in Pharmacy it ranked

third. The College English Entrance Examination is, therefore, a valuable instrument for predicting academic performance in the College.

Due to the scientific nature of the courses in the College, it was expected that the College Science Entrance Examination would be a good predictor of grades. This expectation was not borne out by the data. It was found to be a weak predictor of first-year grades in Nursing, Pharmacy, the combined programs in 1978 and the combined programs in 1979. It was not statistically significant in predicting first-year grades in Medical Laboratory and when the programs were combined in 1980. It was a strong predictor of second-year grades in Nursing and Pharmacy only. A possible explanation for this is that the examination is administered in Arabic, which is the students' mother tongue, but the courses and hence the tests are in English. Another explanation may be the quality of the test itself.

Based on a review of the literature, the College Aptitude Test was not expected to be an effective predictor. Yet, it surfaced as the strongest predictor of the second-year cumulative score, accounting for 24 and 32 percent of the variance in Medical Laboratory and Pharmacy respectively. It was statistically significant in predicting first-year grades of the combined programs in 1978, although it explained only 10 percent of the variance. Therefore, it is apparent that this variable is more significant in predicting second-year than first-year grades.

Recommendations and Conclusion

The results of this study revealed some differences and similarities in the effectiveness of the admissions variables in predicting

academic performance in the various health professions programs.

It is recommended that the admission criteria be different for different programs yet with some common denominators. Based on the findings, it seems reasonable that the College English Entrance Examination should be administered to all applicants and the College Science Entrance Examination to those who wish to study Pharmacy and Nursing.

Further study concerning the relationship between the Tawjehie subscores and academic success in the College's programs would be beneficial. Equally beneficial would be a study of the relationship between the cumulative grades obtained in high school and the Tawjehie.

The achievement of the dropouts on the entry variables is not significantly different from that of the continuing students. The rate of dropout is alarmingly very high. It does not seem that the dropout rate is directly related to the admission process. Perhaps, there are factors related to the instruction as well as the orientation of students to their profession which needs to be further studied. A program of orientation which insures a deeper understanding about the potential role of health professions may address the issue of high dropout rate more effectively than the admission process. Therefore, the following is recommended. First, that a detailed orientation program be a part of the first trimester in the College. This program will encompass a comprehensive study of English along with opportunities to observe the different health professionals at work in the hospital and clinics. Although, this may require more resources such as manpower and financial support, it may prove to be more cost

effective than the approximate 50 percent failure that is occurring due to misunderstanding and misorientation to the health profession.

The second recommendation is to develop an academic counselling service which can aid the students in making appropriate career choices from the nursing and allied health based on their academic abilities and interests.

Finally, administer an examination that is designed to provide a profile of the applicants' attitudes, interest and motivation. This will help in identifying the applicants with unsuitable characteristics and their perception of the profession they are applying to. This would save time on part of the applicants and conserve the resources on part of the College.

In conclusion, it is suggested that the combination of the past record of achievement, the College Entrance Examinations in English and Science and a new measure of interest and motivation should provide the admissions committee in CHS with important and relevant data, especially if the validity and reliability of these measures are determined.

VI. APPENDIX A

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