

Consistency of Self-Study Reviews Conducted by Directors of the Joint Review Committee on Educational Programs on Nuclear Medicine Technology

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A correlational study was conducted to determine if there was agreement among the directors of the Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT), when they independently reviewed the same two self-studies. There was no significant interrater reliability ($p > 0.05$) among the reviewers on one self-study, while review of the second self-study demonstrated statistical significance ($r = 0.68, p < 0.02$). There were no significant correlations between the directors' demographic data and the directors' reviews on one self-study; but on the other self-study, there were significant correlations between the directors' reviews and the number of years of their active service to a professional organization ($r = 0.74, p < 0.01$), and the number of years they had been practicing nuclear medicine or nuclear medicine technology ($r = 0.69, p < 0.02$). There is preliminary evidence that the NMT program's degree of compliance with the Essentials determines the consistency of review, and that the reviewer's number of years of active service to a professional organization and the number of years spent practicing nuclear medicine or nuclear medicine technology correlate with the consistency of self-study reviews.

Accreditation plays a major role in education and health care. "Accreditation is formal approval of educational institutions or programs, as contrasted with recognition of individuals" (1). The health profession of nuclear medicine technology (NMT) is one of 28 allied health professions voluntarily accredited by the Committee on Allied Health Education and Accreditation (CAHEA), which is "the largest accrediting consortium in the United States" (2). CAHEA is recognized by the United States Department of Education and the Council on Postsecondary Accreditation as an accrediting organization.

The expertise of the people serving on the health care review committees of these 28 specific professions contributes to the CAHEA accrediting process. As of the 1988-1989 academic year, 1,522 institutions sponsored 2,821 CAHEA-accredited

programs. During this year, almost 79,576 students attended these accredited programs and 33,543 graduated. Nineteen review committees are utilized for these 28 professions, representing 51 medical specialty and allied health professional organizations. The Joint Review Committee on Educational Programs in Nuclear Medicine Technology (JRCNMT) is one of these review committees.

In 1989, there were 107 accredited nuclear medicine technology programs in the United States and its possessions, with an enrollment of 1,122, and 525 students graduated. To start the review process, a self-study report is submitted to the JRCNMT by an institution that wishes to add a new NMT program or is requested by the JRCNMT for continuing NMT programs. The self-study report follows standards explained in a document called "Essentials and Guidelines of an Accredited Educational Program for the Nuclear Medicine Technologist" (Essentials). The Essentials explain the minimum requirements for a program (3,4).

The JRCNMT is composed of two directors from each of the following sponsoring organizations: the American Society of Clinical Pathologists; the American Society for Medical Technology; the American Society of Radiologic Technologists; the American College of Radiology; The Society of Nuclear Medicine; and The Society of Nuclear Medicine—Technologist Section. Each director is appointed by the sponsoring organization for a four-year term, which may be extended to eight years (5). The terms are usually staggered so that no two representatives from an organization have the same term dates.

When the NMT program's self-study report is received by the JRCNMT, two directors review it for inclusion of the Essentials' requirements. If these requirements are not included, more information may be requested before a site visit. Instructions for the site visitors are also incorporated into the initial review. Two recognized professionals, usually a physician and a technologist, visit the program and report their findings to the JRCNMT. The site visitors may be chosen from among the JRCNMT directors or may be other recognized professionals in nuclear medicine or nuclear medicine technology.

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Prior to the accreditation decision by the JRCNMT, the initial reviewers advise the entire JRCNMT of their accreditation recommendation, based on their initial review of the self-study and the site visitors' report. All JRCNMT directors review these findings and the JRCNMT recommends the status for accreditation action to CAHEA, which generally accepts the recommendation.

In considering the original adoption of a self-study report, the American Medical Association recognizes the report's worth in gaining information for internal usage by the program and also in serving as a "yardstick" for the accrediting agency. The "self-study [is] indeed the heart of the accreditation process" (6). Macpherson emphasizes that the Essentials are "minimum" standards, meaning that even the weakest program is likely to be accredited (6).

Zimmerman (7) maintains that the self-study is more significant than the site visit portion of accreditation because the self-study can be a document of worth within the institution and not just one reviewed by external evaluators. Yarbrough and Seymour (8) and the authors of *A Guide for Self-Study and Evaluation* (9) also recognize the importance of institutional involvement in the self-study and anticipate that the self-study will be a document for continued self-examination by the institution.

Yarbrough and Seymour (8) conducted research on the self-study report, utilizing two-year institutions that had completed an institutional self-study within the years 1981 to 1983. The authors were interested in determining if certain factors were present at the institution or were influenced by the self-study. The group of presidents and faculty felt that a freer exchange of ideas correlated with self-study success; the faculty and coordinators viewed success as being when the self-study process initiated problem-solving operations within the institution and produced a functional report.

Two other items displayed by the self-study coordinators, which also correlated with self-study success, were the participation of the faculty and principal administrators in the self-study process. Surprisingly, two items that correlated with the faculty's perception of self-study success were when the benefits of the self-study superseded the costs and when student participation in the self-study process negatively affected the success of the self-study.

The validity of the self-study process was investigated by the National Association for the Accreditation of Clinical Laboratory Science (NAACLS) (6); it was discovered that when the results of both the self-study and the site visit were used, violations of the standards were found in 40% of the programs; while when only site visits were used, violations were found in 10% of the programs. The self-study was viewed as effective and advantageous by the site visitors and the program officials.

A survey conducted by CAHEA (10) of all CAHEA-accredited institutions in 1981 revealed that institutions place the value of the costs associated with preparing the self-study and conducting the site visit at six times the actual fees paid. The self-study was viewed as the most helpful and the most costly part of the accreditation process.

Consistent review of the self-study reports is crucial to the accreditation process. As mentioned above, in the accreditation process, the two JRCNMT directors who are assigned to review the report will also review the site visit report and recommend accreditation status to the full JRCNMT. The reviewers have had the experience of reviewing many self-study reports; whereas, the site visitors may conduct only one or two site visits per year, at most. Thus, the self-study review that occurs *before* site-visitor selection is critical: it will identify the deficiencies that need to be remedied by the NMT program, and the site visitors can then corroborate that these remedies are occurring.

The purpose of this study was to determine the degree of consistency among reviews, conducted by JRCNMT directors, of NMT program self-study reports and to determine if any reviewer characteristics, such as years in the nuclear medicine field, led to a higher consistency in self-study reviews.

MATERIALS AND METHODS

Twelve JRCNMT directors were asked to review two written self-study reports and supply demographic information about themselves. The content of the reports answered the questions posed by the JRCNMT and were based on access to actual self-study reports obtained from various NMT programs by the JRCNMT. Directors were randomly assigned one of the two studies to review first. The self-studies were different from one another in length and amount of information supplied. One self-study described a program conducted in a hospital setting with no affiliation with other institutions (Abba Hospital); while the other was a college of medicine affiliated with several other institutions (College of Medicine).

The self-studies were reviewed using check-off sheets (similar to those used in actual reviews) that followed the seven sections of the Essentials: Sponsorship, Resources, Curriculum, Students, Operational Policies, Program Evaluation, and Maintaining and Administering Accreditation. Under each of the seven sections, appropriate descriptions of the requirements were listed. To complete the check-off sheets, the reviewers subjectively compared the self-study report with the Essentials and checked one of five defined choices for each item: (1) beyond minimum requirements; (2) adequate; (3) present but unsatisfactory; (4) not present; and (5) not applicable.

After converting the scores for each section on the check-off sheets into interval values from four to one, the range, mean, and mean percent were reported for each section. Interrater reliability coefficients were calculated on the seven subscores (11). The descriptive demographic statistics of range, mean, and standard deviation were obtained from the interval measures.

Interval demographic data (the number of years as a director of the JRCNMT, the number of years as a site visitor for the JRCNMT, the number of years of active service in a professional organization, and the number of years practicing

nuclear medicine or nuclear medicine technology) were treated with the Pearson product-moment correlation equation to test the correlation between the directors' total scores on the self-study analysis and the interval demographic data. Due to the small sample size, mathematical corrections for attenuation (that project correlation values for a larger sample size) were performed (12).

Noninterval demographic data (formal courses taken in educational methodology, attainment of a degree in education, site visitor for other educational programs, age, gender, and training as a physician or technologist) were used to describe various attributes of the directors.

Reviewer comments on the self-studies were categorized and analyzed according to the seven sections of the Essentials. This analysis was accomplished subjectively by looking at the content of the comment and matching the comment with the appropriate section of the Essentials. The number of times a specific area or concern was cited was noted, as was the diversity of comments and the relative seriousness of the violation. For instance, a comment that one course outline was missing was viewed as a less serious violation than the absence of all course outlines. The diversity and relative compliance with the Essentials was reported.

RESULTS

All twelve directors returned the completed reviews of the two self-studies and the demographic data. Descriptive statistics for each of the seven sections from the Abba Hospital self-study are shown in Table 1. An interrater reliability coefficient of $r = 0.21$ was not significant at the $p = 0.05$

level. An absolute value of 0.55 for the correlation coefficient was needed for significance at the 0.05 level for a nondirectional (two-tailed) test.

The descriptive statistics for the twelve reviews of the College of Medicine self-study are shown in Table 2. An interrater reliability coefficient of 0.68 was found significant at $p < 0.02$.

Analysis of the demographic data revealed that the number of years as a director of the JRCNMT ranged from 0.25 to 8, with a mean of 4.69, $s.d. = 2.56$, while the range for the number of years as a site visitor for the JRCNMT was 0. to 15, with a mean of 6.17 yr, $s.d. = 4.71$. The range for the number of years that the directors had been active in their professional organization was 9 to 25, with a mean of 18.42, $s.d. = 5.26$, and the range for the number of years they had practiced their current profession was 9 to 30, with a mean of 22.25, $s.d. = 6.85$.

Six directors were technologists and six were physicians. At least ten directors (83%) had graduated with an advanced degree; six (50%) had a medical degree. Seven (58%) directors had some formal training in educational methodology; four of the technologists (33% of the total sample or 66% of the technologists) had graduated with a master's degree in education. Four directors (33%) were site visitors for other types of educational programs.

Of the twelve directors surveyed, six were 46–55-yr old, three were 56–65-yr old, two were 36–45-yr old, and one was over 65-yr old. These ages were extrapolated to a mean of 57.5 years. Interestingly, all of the physicians were male and all but one of the technologists were female.

TABLE 1. Descriptive Statistics for Abba Hospital Self-Study Review

Statistic	Sections of the Essentials*							Total
	I	II	III	IV	V	VI	VII	
Total possible points	16.0	60.0	128.0	20.0	44.0	16.0	8.0	292.0
Range	3.0–9.0	28.5–36.0	37.0–112.0	7.0–14.0	9.0–29.0	0.0–4.0	3.0–6.0	103.0–188.0
Mean	6.33	31.83	75.33	10.33	19.62	2.17	5.00	150.62
Mean (%)	34.58	53.06	58.85	51.67	44.60	13.54	62.50	51.58

* I = Sponsorship, II = Resources, III = Curriculum—Clinical and Extramural Facilities, IV = Students, V = Operational Policies, VI = Program Evaluation, VII = Maintaining and Administering Accreditation.

TABLE 2. Descriptive Statistics for College of Medicine Self-Study Review

Statistic	Sections of the Essentials*							Total
	I	II	III	IV	V	VI	VII	
Total possible points	16.0	60.0	128.0	20.0	44.0	16.0	8.0	292.0
Range	6.0–13.0	32.0–54.0	73.0–110.0	10.0–17.0	17.0–33.0	4.0–10.0	5.0–8.0	155.0–233.0
Mean	9.67	39.37	87.25	13.83	25.17	6.25	5.75	187.29
Mean (%)	60.40	65.62	68.16	69.15	57.20	39.06	71.88	64.14

* I = Sponsorship, II = Resources, III = Curriculum—Clinical and Extramural Facilities, IV = Students, V = Operational Policies, VI = Program Evaluation, VII = Maintaining and Administering Accreditation.

There were no significant correlations between the total score of the Abba Hospital self-study review and any of the demographic interval data. The correlations ranged from -0.01 to 0.52 . For significance at the 0.05 level, for a two-tailed test, the absolute value of the correlation coefficient had to be greater than 0.58 .

For the College of Medicine self-study review, there were correlations between the directors' total score and the demographic variables. There were significant correlations between the total score and the number of years of active service to a professional organization ($r = 0.74$, $p < 0.01$) and between the total score and the number of years spent practicing nuclear medicine or nuclear medicine technology ($r = 0.69$, $p < 0.02$). The other correlations ranged from -0.02 to 0.30 and were not significant at the 0.05 level.

Correction for attenuation resulted in a true correlation of 0.90 ($p < 0.001$ for the nondirectional test) between the directors' total score and the number of years of active service to a professional organization. The true correlation was 0.84 ($p < 0.001$ for the nondirectional test) between the directors' total score and the number of years spent practicing nuclear medicine or nuclear medicine technology.

DISCUSSION

Descriptive statistics disclosed that the sample of twelve director reviewers was homogenous on almost every demographic variable. The directors were people who were established in their profession and over 35-yr old. We expected the number of years the directors had actively been pursuing their profession and had been active in their professional organization would be high because sponsoring organizations only appoint representatives who are well-known, with high professional standing within the profession. Building this status usually takes a number of years, depending on the size of the organization and the interest of the individual.

It was gratifying to find that most of the directors had formal schooling in educational practices because the sponsoring organizations' requirements for appointment to the JRCNMT do not usually include participation in formal educational methodology courses.

Half of the physician directors were also active in reviewing programs for nuclear medicine physician residency education programs. It is not known whether the physicians were appointed to the JRCNMT based on their experience as reviewers of residency programs or asked to become reviewers of nuclear medicine physician residency programs based on their JRCNMT experience.

Fewer opportunities are available for technologists to review other types of health-related educational programs. One-third of the JRCNMT technologist directors were medical technologists who also had the opportunity to review medical technology programs. Half of these medical technologist directors were reviewers of other educational programs.

Female physicians were not represented and male technologists were underrepresented.

There was, overall, some degree of consistency among the

JRCNMT directors' self-study reviews. While there was no consistency among the reviewers when they reviewed the Abba Hospital self-study, there was significant consistency, when they reviewed the College of Medicine self-study.

We concluded that JRCNMT reviewers were more consistent in their independent reviews of self-studies when the self-study was more comprehensive and was in compliance with the Essentials. The College of Medicine self-study was more complete than the Abba Hospital self-study and greater agreement was reported among the reviewers. The reviewer comments for each self-study indicated a greater number of deviations from the Essentials for the College of Medicine self-study, but these were minor infractions when compared with the Abba Hospital self-study comments. We also concluded that the number of years of active service to professional organization, and the number of years spent practicing nuclear medicine or nuclear medicine technology correlated with producing a self-study review that was more comprehensive and in compliance with the Essentials.

The reviewers may have spent longer in reviewing one self-study than the other. The bulk of material from the College of Medicine self-study may have compelled the reviewers to spend a long time reviewing that material; thus, leading to a thorough analysis with lengthy comments and a significant interrater reliability coefficient. In contrast, the shortage of material in the Abba Hospital self-study may have led to abbreviated reviews for that self-study report. Since the amount of time taken to conduct the reviews was not recorded, the time differential cannot be confirmed.

The lack of correlation among the reviewers on the Abba Hospital self-study may have been because the self-study itself was out of compliance with the Essentials in many areas. Due to the severity of the deficiencies, each reviewer may not have identified all of the specific deficiencies. Reviewers may have had an idea that the program had difficulty in meeting some parts of the Essentials, in general, but may not have been able to pinpoint where the program had specific problems that should be addressed on the check-off sheet.

This study was not conducted in accordance with the usual JRCNMT practices for self-study reviews. The directors conducted individual, independent reviews, without consulting each other. In actuality a two-director team reviews a self-study. This two-person review is viewed as self-regulating and compensates for any individual inconsistency.

After reviewing the first self-study, whether it was that of the Abba Hospital or the College of Medicine, the reviewers did not seem to exhibit any practice effect when they were required to review a second self-study.

It is possible that the directors' reviews may have been biased by their work environment: hospital or academic institution. However, an equal number of reviewers worked in the hospital and college settings, so if there was any effect related to reviewer background it would be equal for the two settings.

The self-studies produced for this research were based on actual self-studies submitted by two institutions to the JRCNMT for accreditation. None of the directors participat-

ing in the study were initial reviewers of the programs. After site visits to both institutions, the JRCNMT recommended that the institution represented in the College of Medicine self-study receive accreditation for the maximum 5-yr status. The institution represented in the Abba Hospital self-study was seeking original accreditation, which was denied by the JRCNMT. Even though consistency was not present for the individual review of both self-studies, the entire JRCNMT agreed upon the final accreditation outcome for both programs, indicating the positive effect of consultation, which reduced reviewer inconsistencies.

The reviewers could not identify the actual institution from the self-study provided to them in this research and were not informed of the actual outcome of the accreditation process during the research project.

The twelve reviewers were aware that they were part of a research study. It is uncertain whether this awareness contributed to any deviation from a director's normal review practice. The reviewers were not given any information concerning how they performed on the first self-study, prior to receiving the second self-study.

The sample size of twelve necessitated a larger interrater reliability coefficient for statistical significance than would be required for a larger sample. By doubling the sample to 24, significance at the 0.05 level would be obtained with a decrease from an r value greater than 0.5529 to one greater than 0.3915. The obtained interrater reliability coefficient for all the reviews of the College of Medicine self-study ($r = 0.68$) would be significant at $p < 0.001$ if the sample size had been doubled.

The use of only twelve active JRCNMT nuclear medicine technology reviewers limits the conclusions of this study to these specific people. It cannot be assumed that other JRCNMT directors or personnel from other review committees would respond similarly. The problems associated with generalizing the study to other groups is magnified by the variations in practice of the different allied health professions and the reflection of these practices in their respective standards for accreditation.

This study provided preliminary information concerning the degree of consistency among twelve JRCNMT reviewers and the correlation between demographic data and the directors' reviews.

For better generalization, research involving all review com-

mittees should be conducted. Additional research, expressing all the review committees' directors, could be conducted to answer the following questions: Is there consistency of self-study review from one committee's group of reviewers to another? Are there any factors that could account for any consistency in the reviews? Does the thoroughness and length of the self-study affect consistency in reviewing self-studies?

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