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in the face of diminishing resources**

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NURSING EDUCATION - COSTING ISSUES

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Exact measurement of resource use can be a time-consuming and complicated process...less accurate measurement procedures often are adopted in response to time, power and technical constraints. (Young, 1984:78)

This 'paper' is still very much a working document rather than a report of a completed study. As such, parts are in note form rather than fully written out and the literature review is, as yet, incomplete. Since this paper deals with the methodological issues of the study no results are reported.

Interest in cost containment in health care system is leading to development of a variety of strategies for measuring and describing the delivery of service, including nursing service (i.e., Casemix, DRGs). The more careful assessment of nursing care costs is leading to conclusions which are at variance with the assumptions on which resources have often been allocated in health care. For example, one study which compared nursing service in a large medical unit in 1969 with the same unit in 1985 concluded that 'the same amount of care is being given in less than half the time - an increase in productivity of 210%: and refuted the assumptions that increased education for nurses, expansion of nursing budgets or low levels of nursing productivity as major contributors to rising hospital costs (Donovan & Lewis 1987).

Another study concluded that 'the costs of nursing have been overestimated, while nurses historically have been paid low salaries....Correcting both problems depends in part on the ability to cost nursing services accurately and to determine the value of those services in relation to other components of health care costs' (Jacox 1987).

Real progress in determining the cost and value of nursing care began only when nursing care began to be treated separately from the *per diem* or 'hotel' costs of hospital care and when the differences between different kinds of nursing care began to be described accurately.

A similar dilemma exists in nursing education. In Australia, nursing education has been somewhat arbitrarily deemed to be equivalent to the teaching of computing, languages, and visual/performing arts for purposes of calculating per student funding to universities (Baldwin, 1990).

At the same time clinical instructors for nursing and other health sciences (except medicine) have been valued by both AHEIA and FAUSA at the rate for lab demonstrators.

Some of the agencies responsible for approving pre-registration nursing programs are still using measures such as number of hours of off-campus clinical experience as indicators of acceptable programs (letter to Professor A Zelmer, from the Board of Nursing Studies, Queensland, 15 August, 1991).

Given the number of students enrolled in programs leading to registration as a nurse in Australia (17,895 in 1989 - DEET, 1989, it is important to develop better measures of the actual costs of nursing education rather than continuing to rely on assumptions, the 'good will' of health agencies and individual nurses or the rather spurious historical cost data.

Methodological problems

Complexity of the activity

Just as those who first started to develop Case Mix, DRGs and Nursing Diagnoses had to begin accurately describing the complexities of nursing care in a variety of environments, so we must begin to establish common measures of nursing education before we can begin to compare costs and benefits.

Student nurses must:

- learn factual material;
- develop psychomotor skills;
- develop interpersonal skills;
- learn how to combine the above effectively in solving problems and providing nursing care;
- develop other problem-solving skills (accessing information, etc.);
- develop a professional ethos.

The Australian Nurse Registration Authorities' Conference (ANRAC) has described the competencies for Registration as a Nurse in considerable detail (ANRAC 1990).

Most nursing education programs are trying to help students meet learning objectives in all of the above domains more or less simultaneously (integrated theory and practice) using classroom teaching, laboratories, independent study strategies and real-world clinical practice.

Support services

Just as nurses in clinical areas need to organise their care around the sometimes conflicting demands of x-ray, dietary services or pathology, so nurse educators must usually organise their programs around 'supporting' departments which teach foundation subjects in biological or social sciences or around the availability of appropriate clinical experience.

To carry the analogy further, just as nurses in service areas are frequently called on to dispense drugs, take x-rays or perform chest physio 'after hours' or in 'remote' areas, so nurse educators may find themselves responsible for filling in the gaps in service teaching.

Student variability

While every educational program attempts to put some limit on the range of student variability through the establishment of admission criteria, there are a number of factors which have a major impact on the teaching-learning process:

- academic preparation;
- prior work experience;
- personal health/illness experience and status;
- age, maturity and life experience;
- ethnic background;
- English-language facility (oral and written).

Instructor variability

It is now well recognised that nurses move through various stages from 'novice to expert' (Infante, 1985) in the development of their professional practice. Similarly we expect that instructors will become more expert (more efficient?) over time, but the stages in this process have not been described.

Other factors which are likely to be important are:

- the level of clinical expertise and knowledge of the instructor (relevant to the subject being taught);
- familiarity with the setting and with the students.

Teaching-learning environment

Important variables which may affect the teaching-learning process are:

- availability of appropriate equipment, references, etc.;
- availability of appropriate experiences;
- physical surroundings (noise, seating, etc.).

An attempt at measurement

As a beginning step to obtain more specific information, at the Faculty of Health Science, UCQ, we have been attempting to measure the cost of teaching four common procedures to nursing students in a pre-registration program.

Established in 1990, the Bachelor of Nursing is by full-time study over three academic years. The course includes on-campus lectures, laboratory sessions, and clinical experiences as well as off-campus clinical experience conducted in a variety of health care settings including hospitals and community health services. Graduates are eligible for registration as a nurses in Queensland.

The Faculty of Health Science is located in a new building with purpose-built laboratory facilities for clinical teaching. In 1991 (the first-year of the study) there were 95 students enrolled in the first-year and 63 in the second-year. In 1992 there were approximately 110 students in the first-year and 90 students in the second-year (the numbers varied slightly over the time the study was conducted).

The four procedures chosen were deemed to be common to most nursing programs and were skills which could be measured reasonably objectively to determine when the student had reached a satisfactory level of achievement.

The four procedures selected for the measurement study were:

- taking blood pressure and handwashing for first-year students; and,
- sterile wound dressing and percussion and vibration procedures for second-year students.

For each procedure, the teaching component consists of:

- preparation time which in some cases depends on the experience of the lecturer/tutor
- a theoretical component (usually a large group lecture) explaining the fundamental principles of physiology, microbiology, etc., underlying the procedure;
- demonstration, observation practice by the students (usually in the laboratory but often in real-world practice situations); and
- clinical assessment of students.

The learning component consists of:

- the students' in-class time (lectures, demonstrations in the lab);
- the students' individual or group practice time (in own time) in the lab or elsewhere;
- the time taken by the students in completing the assessment.

The students were deemed to have successfully learned the skill when they had reached level three of Dave's Taxonomy of Psychomotor behaviour (precision) (Infante, 1985) as demonstrated in a videotaped performance or by observation in the clinical area.

Costing the teaching

Instructional time has been costed by multiplying the face-to-face hours of instructional time by the rate for an academic appointed at the first step of Level B. This level was selected as an approximation of the rates of more senior lecturers and those appointed at tutor level. As pointed out in discussion at the HERDSA meeting all hours are not the same. Levels of concentration and involvement may vary considerably and will affect effectiveness and efficiency of teaching, but this factor has not been considered in this study.

Direct costs for teaching materials (handouts, overheads, AV materials), and disposables have been calculated, where applicable, on the basis of costs of disposables to the university.

Equipment, text books, etc., have not been costed, although in practice the wear and tear on some equipment should be taken into account.

Collecting the data

Each instructor (whether classroom or lab) who participated in the study was asked to complete a time sheet during the period the particular procedures were being taught. While there was generally good cooperation with regard to this task, the group did need frequent reminders (usually weekly at their staff meeting) and one must question how accurate was their recall. There were also some likely gaps and overlaps in the data with regard to the assessment of the students since (particularly for the second-year students) this may often have been done in the clinical area at the same time as a number of other activities. Each student was asked to complete a time sheet indicating the amount of practice or other learning activity which they undertook in relation to the specific procedures. The time sheets were completed anonymously and were collected by a research assistant who was generally not otherwise involved with the students. We hope that this reduced the possible overstatement of practice time and that the frequent reminders minimised the errors introduced by defects in recall and recording.

Limitations

- no allowance for ongoing reinforcement teaching;
- there was considerable overlapping of time and students;
- difficult to know where the cut off point occurred for indirect costs;
- there were complaints from the recorders concerning the design of the data recording sheet;
- the problems of recall and recording referred to above.

To be continued

This study has been repeated for the past two years in an effort to overcome some of the methodological problems. The data has not shown great variation when the same procedure is selected.

The next steps will be to:

- expand this study to other nursing procedures;
- attempt to obtain comparative data from other methods of teaching;
- attempt to obtain comparative data from other schools of nursing;
- expand this study to other health science programs which teach clinical procedures.

We would welcome any comment from those who have undertaken similar studies or who would be interested in cooperating in the future development of the costing of clinical teaching studies.

Note

It would not be possible to carry out this type of study without the sustained cooperation of the academic staff and students of the Faculty of Health Science. To each who conscientiously added his or her piece of data to the puzzle my sincere thanks. Over the course of this project several research assistants have been involved and I would also like to express my thanks to Judy McDonald, Gay Eade and Venupriya Nardella for their help.

The discussion of the draft paper at the Queensland HERDSA conference in April, 1993 has also added some further insights to this study; my thanks to those who participated in the program session for their contributions.

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