Practice Profiles in Evaluating the Clinical Experience of Family Medicine Trainees

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A practice profile is a compilation of information allowing definition and evaluation of any of several parameters of health-care delivery. Prerequisites for development of profiles presented in this report include: suitable classification of health problems; patient demographic data; identification of individual and groups of health-care providers; and definition of the practice or study population. Details are given for two profiles: the assigned patient and the diagnostic workload profiles. Single profiles are purely descriptive but, when evaluated by appropriate peer comparison, may form the basis for a more dynamic process—that of improvement and change. Possible applications of practice profiles are discussed.

One of the more elusive educational problems of a family practice residency program is the establishment of criteria for optimum clinical experience for trainees. While mandatory and elective hospital rotations provide opportunity for development of expertise in specific areas, ambulatory care experience is far more difficult to evaluate. To provide each trainee with an appropriate balance of outpatient health related problems is a formidable task. One of numerous complications is the fact that trainees obviously differ not only in ability and speed of learning but also in interest and orientation.

Specific circumstances may occasionally dictate unusual educational goals for a given trainee. However, it would seem most desirable that the majority receive as broad an ambulatory care experience as possible during the training years. Ideally, each trainee would be assigned a patient population representative of that available to the entire practice. In addition, contact with patients with varying diagnoses would be as evenly distributed as practice constraints permit.

To accomplish these goals profiles were constructed for two parameters of each trainee's practice: the assigned patient profile and the diagnostic workload profile.

Training Setting

The Rochester Family Medicine Program is a private, nonprofit teaching practice with a staff of six full-time family practice faculty, appropriate consultants, and 30 family medicine trainees. It is also a family medicine health center where residents in training receive their ambulatory care experience. The practice is located in a metropolitan area of over 800,000 population and the socioeconomic status (SES), age, sex, and racial distribution of the patient population of about 10,000 people is representative of that of the general population.

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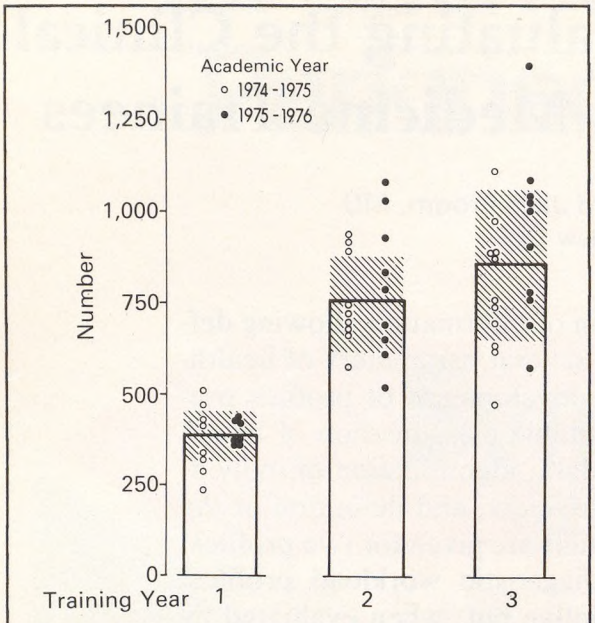

Figure 1. Problem contacts per year. Bars describe mean number of contacts for all trainees at level 1, 2, or 3, over a two-year period ± SD. Circles represent individual trainees.

Methods

Construction of the two types of practice profiles under consideration requires a minimum of three patient data collection facets:

1. *An age-sex register.* It is necessary to register the age and sex of the entire practice and of that segment of the practice treated by each provider. The technique for establishment and maintenance of an age-sex registry has been described elsewhere.[1]

2. *A classification of diseases. The International Classification of Health Problems in Primary Care* (ICHPPC) has facilitated suitable codification of health problems encountered in the ambulatory setting.[2] ICHPPC contains 18 major diagnostic titles which include physical, psychological, and social problems and is particularly suited for use with problem-oriented medical records (POMR)[3] because of an expanded section of diagnoses which appear at the symptom level.

3. *The diagnostic index.* One form of diagnostic index, the E-Book, has been described in detail elsewhere.[4,5] An index is necessary for the reporting and retrieval of information on health problems which have been diagnosed and are to be compared. Recording may be by *either* manual or computer techniques.

Information on the provider must identify him/her as an individual as well as identify his professional status (ie, training year). Cross-indexing identifies, as well, those patients for whom he is primary provider.

The assigned patient profile is a simple compilation of the demographic variables of individual and group patient populations. To establish diagnostic work load, every diagnosis for each office face-to-face encounter was tabulated, and accumulated diagnostic contacts are reported as a percent of the individual or group's total workload. The comparisons illustrated in this communication concern the frequency of diagnostic problems encountered within the most predominant of the 18 diagnostic sections of the ICHPPC classification.

Results

The average numbers of total diagnostic (problem) contacts (± one standard deviation [SD]) per year are shown in Figure 1. Academic years 1974-1975 and 1975-1976 were studied. It is apparent that the average number of contacts increased dramatically from first to second training year; however, this is readily explained by an increasing amount of time available for ambulatory care over the training years. Each circle represents one trainee; open circles for 1974-1975 and closed for 1975-1976. With only four exceptions all trainees fell within two standard deviations of the mean for their training level. The wide range of individual numbers of total problem contacts is not unexpected since, in this instance, every coded problem for each encounter is tallied and each visit may involve one or, more usually, multiple diagnoses.

The data base for Figure 2 differs from Figure 1 in that assigned patient population is described. Patient assignment will differ from problem contacts since an individual patient may make only one, multiple, or no visits within a given time period and may receive any number of coded diagnoses. Each trainee is the primary provider for

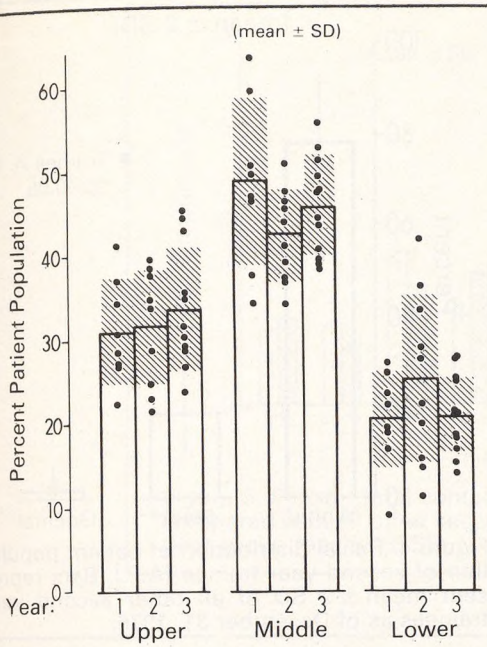

Figure 2. Socioeconomic status (SES) of patient population by training year (1, 2, 3) and SES (upper, middle, lower) for academic year 1975-1976. Bars describe mean percent ± SD. Circles represent individual trainees.

a specified group of active patients. Each patient is counted only once regardless of the number of health-related visits. Assigned patient population, then, is the primary source of ambulatory clinical experience for each trainee. Patient socioeconomic status (SES) is one demographic characteristic which we feel should be apportioned as equally as possible among trainees. Closed circles represent individual trainees while bars and hatched portions represent mean percentages ± SD for each training level and SES class. Not only is there no significant distribution difference between training years, but overall distribution has been shown to closely approximate the distribution of SES in the program's area population.

Although distribution of contacts within standard age groups did not vary, age/sex distribution of assigned patient population was also considered (Figure 3). In this instance, the present first year trainee patient population was studied. The first year group was deliberately chosen since it is composed of equal numbers of male and female trainees. Minor variations are seen in overall age distribution between male and female trainees, but the most strikingly significant difference is shown by the preponderance of female patients assigned to female trainees, particularly in the 15 to 44-year age range. Implications of this finding will be covered in the discussion.

Another potential source of bias in patient population is race. A black, second-year trainee's patient population was compared with the racial distribution of the populations of her peers (Figure 4). Percents white and black of this trainee's population fall outside two standard deviations of that of her peers, most definitely showing a racial bias.

Figure 5 represents a different type of analysis. Given patient populations of similar demographics and total problem contact numbers within the average range of his peer group, certain individual comparisons are feasible. Percent total problem contacts falling within each of the most frequent 18 ICHPPC diagnostic sections are shown for an individual trainee (circles) and peer groups (bars). Potential diagnostic problem areas may be identified as those falling far without the average error range about the mean (SE). It may be noted that trainee P.S. exhibited consistent areas of departure within diagnostic categories from the peer average during both years under study.

Discussion

These analyses provide useful tools for evaluation of ambulatory care experience. Obvious and grossly inappropriate for family medicine training would be the hypothetical situation in which, for a given trainee, 50 percent of ambulatory patient contacts were well-child checks. Subtler differences, however, require more sophisticated inspection. Essential to all analyses is accurate and complete data collection. Computer entry, storage, and retrieval greatly facilitate such evaluative maneuvers. Establishment of thoroughly delineated general educational goals of any training program is also necessary for interpretation.

It would appear that patient population assignment to various level residents is fairly uniform in this training setting in most regards. Although women have always been freely accepted for training, it was not until July 1976 that an equal sex distribution of new trainees was established. Analysis of that year's patient population as shown in Figure 3 was highly skewed for female

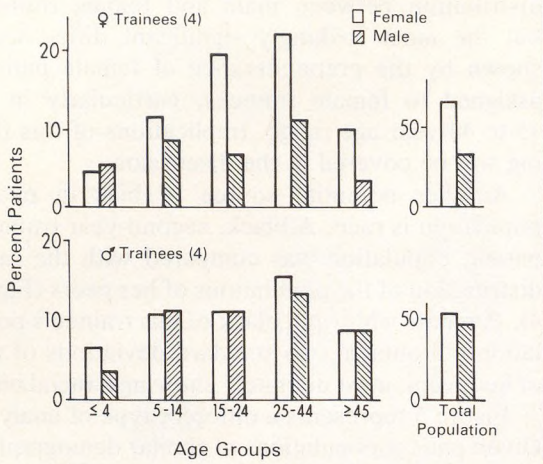

Figure 3. Age-sex distribution of patient population of first year trainees as of December 31, 1976. Sex distribution significantly different (Chi-square test) for all age groups except ≤4 ($P<0.05$).

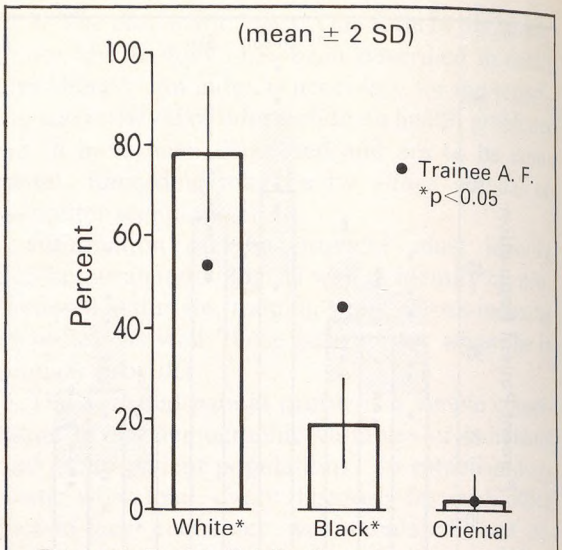

Figure 4. Racial distribution of patient population of second year trainee (A.F.). Bars represent mean ± 2 SD of all other second year trainees as of December 31, 1976.

trainees. A number of possible explanations exist for this sex-related phenomenon. To list a few:

a. New patients may be requesting same-sex physician trainees.

b. Secretaries who make provider assignment may be consciously or subconsciously placing patients with like-sex providers.

c. The trainee himself, or in this case, more likely herself, is requesting such a patient distribution feeling it will more accurately reflect her patient load when established in practice.

The same sort of factors or some combination thereof may also be operative in the unusual racial distribution of the black trainee as illustrated by Figure 4. The propriety of bias in assigned patient population based upon trainee demographic characteristics is difficult to assess. Two extreme interpretations are immediately apparent:

a. Like-sex and like-race patient assignment bias is quite appropriate since it will most adequately prepare the trainee for future practice.

b. Sex-race bias is undesirable and warrants change since it does not afford the breadth of health-care experience usually associated with the well-trained family physician.

There would appear to be no single answer for all training programs. Individual program and trainee orientations need consideration. The diagnostic workload profile illustrated in Figure 5 is used to identify potential diagnostic problem areas. Once a problem area is identified, further breakdown and audit of specific diagnoses within that general category may be in order.

To function most effectively as an educational instrument for change, all described analyses must be performed with greater frequency than those shown here as illustrative models. Although variability is greater, assessment is now made of the ambulatory care experience of all trainees at three-month intervals. Analyses are performed as rapidly as possible so that change may be implemented where indicated.

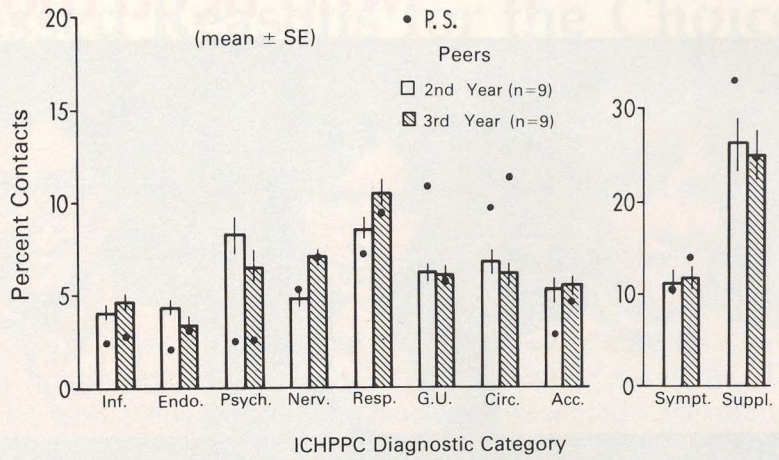

Figure 5. Percent total contacts of trainee P.S. by diagnostic category compared with all other second and third year trainees. Bars represent peer group means ± SE.

Applications

The uses of practice profiles in a training setting are many. They may be used to measure productivity, to delineate areas in which the practice population is skewed in any measurable dimension, to compare the clinical characteristics of trainee groups (ie, third vs first year trainee), or any number of other practice related phenomena.[6] The two profile types illustrated here may lead to certain specific actions. If a trainee's patient population is inappropriately distributed, those areas of deficit or excess need be considered.

Adjustment of the population may be achieved in one of two ways. First, reassignment of present patients, and second (and more consistent with the concepts of continuity of care), selective assignment of new patients and/or those of graduating trainees.

Analysis of the diagnostic workload profile, with its delineation of potential diagnostic problem areas, creates a more difficult situation. To establish causes for deviant diagnostic frequencies in certain areas, once noted, conversation with the involved trainee is necessary. No implication is made that the peer norm is necessarily "best." It may well be that the distribution of diagnostic contacts of the trainee is most appropriate for his/her practice population. A shift in patient load may be indicated, however, if he is seeing a preponderance of one type of diagnostic problem at the expense of other equally important conditions. Another possibility is that the trainee is over or underdiagnosing certain problems. Here, chart audit and review of diagnostic criteria are in order.

Thus, establishment of practice profiles in a training setting can be of practical value. It is hoped that changes instituted on the basis of such data will contribute substantially to continued improvement in the training of family physicians.

References

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