Case mix and content of trainee consultations: findings from the north of England study of standards and performance in general practice

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SUMMARY

Background. *Previous studies have examined the differences in the work of trainees and trainers. However, they have not investigated how many of these differences are due to differences in the case mix seen by trainees.*

Aim. *A study was undertaken to investigate the effect of case mix on the content of consultations with trainee general practitioners.*

Method. *Details of surgery consultations with 207 trainee general practitioners and 255 principals in 62 training practices in the north of England were prospectively recorded during one week in each of four consecutive years.*

Results. *Trainee general practitioners saw a higher proportion of younger patients and those categorized as suffering from an acute minor condition compared with principals. They saw a lower proportion of patients categorized as suffering from chronic intermediate, chronic major and female conditions. The reported content of trainee and principal consultations differed over all four years in that trainees examined more patients, issued more new prescriptions, issued fewer repeat prescriptions, arranged fewer return appointments and referred fewer patients. However, adjusting for case mix reduced the number of significant differences between trainees and principals to two: trainees issued fewer repeat prescriptions and had more consultations lasting longer than nine minutes.*

Conclusion. *The case mix and content of consultations differ between trainees and principals and some of the differences in content are due to the differences in case mix; trainees generally behave more like principals than has been previously suggested. Thus, case mix is an important factor in understanding the content of trainee consultations.*

Keywords: consultation analysis; consultation patterns; trainees; trainers; comparative studies.

Introduction

VOCATIONAL training for general practice has been established in the United Kingdom for over 20 years. It usually consists of two years in various hospital specialties and a year in general practice, sometimes split into two periods of six months.[1] Studies of the year in general practice have highlighted difference in the work of trainees and their trainers[2,3] with trainees seeing more patients with acute and relatively minor illness at the expense of patients with chronic, long term illness.[4,5] These studies have been small scale, for example focusing only on a single practice,[2-4] chronic illness[5] or a limited number of trainees.[6-8] They have, however, led to suggestions that patients with chronic illness should be steered towards trainees, and their management and follow up monitored, thus increasing trainees' range of experience.[4,9]

These studies have not been able to offer any insight into whether trainees behave in an inherently different manner from established principals if faced with the same clinical content in their consultations. Nor have they been able to provide a detailed picture of the typical consulting patterns of trainees. In the course of a larger study[10,11] an opportunity arose to investigate both the case mix and consulting patterns of trainees on the vocational training scheme in the former northern regional health authority in England.

Method

As one part the of north of England study of standards and performance in general practice,[10,11] trainers, their partners and their trainees were asked to record brief details of every consultation that took place during a one week period in each of four consecutive years over the period 1984–88. The recording weeks were practice specific and distributed randomly through the year. The consultation details were recorded on a practice activity record, a book of structured A4 pages on which specific items were recorded. The reason for consultation was based on the classification developed by Carney[12] because pilot work suggested that the inclusion of presenting symptoms and provisional diagnoses was time-consuming, both to complete and subsequently to interpret and code. This classification reflects both the severity and duration of the condition and represented a compromise between the small amount of time needed to record the information and the potential loss of information from such an aggregating classification.

The practice activity record was presented as a checklist so that doctors had only to tick a box corresponding to each item. While much of the information collected was straightforward, judgement was required in recording reason for consultation. To minimize variability in recording this, detailed instructions were provided on the back of each page of the practice activity record including examples of each of the eight categories of reasons for consultation. These instructions were supplemented by a personal briefing from a member of the research team when the records were delivered to each practice.

As a check on the accuracy of the data recorded in these records, practice reception staff were asked to keep an independent record of the number of consultations with each doctor throughout the week. Although information was collected on home visits and telephone consultations the analysis presented here is concerned only with surgery consultations.

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The case mix of a consultation are those characteristics by which the consultation can be categorized, for example, the age and sex of the patient consulting and the reason for consultation. As differences in behaviour between trainees and principals could, in part, be due to their seeing different patients, as defined in these terms, it is important to allow for this before commenting on behaviour: this is 'adjusting for case mix'.

Analysis was performed using the statistical packages *SPSS* and *GLIM*.[13] Logistic regression analysis[14] was used to investigate differences in behaviour between principals and trainees. To determine whether observed differences could be attributed to differences in case mix, odds ratios[14] were generated before and after adjusting for case mix (age and sex of patient and reason for consultation). In an initial analysis, data for individual doctors were aggregated across all four years to provide a single observation in the form of a binomial proportion. To examine whether differences in behaviour were consistent across time, separate tests were then undertaken for each of the four years of data collection. In view of the large sample sizes and the number of statistical tests conducted, a significance level of one per cent was adopted and hence 99% confidence intervals are quoted.

Results

A total of 213 practice activity records were completed by 207 trainees and 828 were completed by 255 principals in 62 practices. These practices represented 83% of those eligible to participate in the study and 70% of training practices in the northern regional health authority. After excluding consultations for which there were no data on patient age or sex, reason for or length of consultation, there remained details of 15 621 consultations with trainees and 93 404 consultations with principals.

The number of consultations recorded in the practice activity records by principals agreed closely with the independent record kept by practice staff,[15] suggesting that the practice activity record represented an accurate record of doctors' activities.

There were no significant differences in the age or sex of patients seen or in the reason for consultation between those trainees in their first period of six months in general practice and those in their second period. Furthermore, there were no significant differences between these two groups of trainees in the content and management of consultations. Although the length of consultations varied significantly at the 1% level, the differences between first and second time trainees were not consistent across all four years of data collection: the difference reached statistical significance in only three of the four years; in two of these, the proportion of long consultations was greater for first time trainees, but in the remaining year, however, this trend was reversed. Since there was no evidence of any consistent differences between first and second time trainees, the data for all trainees were combined for subsequent analyses.

The raw data for trainees and principals, as recorded on the practice activity records, are summarized in Table 1. Trainees had a higher percentage of consultations with children aged less than 12 years, and a lower percentage of consultations with patients aged 65 years and over compared with principals. They also had a higher percentage of consultations with patients with acute minor conditions and a lower proportion with patients with chronic intermediate, chronic major and female conditions compared with principals.

There were also significant differences between trainees and principals in the content and management of consultations (Table 1). Odds ratios of trainees against principals for each variable before adjusting for case mix in each of the four years of data collection are shown in Table 2. An odds ratio greater than one implied that a trainee was more likely to undertake a procedure than a principal. An odds ratio of one implied that trainees and principals were equally likely to undertake a procedure. Therefore, if the confidence interval included one there was no evidence that trainees differed significantly from principals for that particular year of data collection; conversely, if the confidence interval did not include one it can be concluded that trainees differed from principals. For five variables — patient examined, new prescription issued, repeat prescription issued, return appointment arranged and patient referred — significant differences were consistently observed in each of the four years. Three further variables, clinical procedure performed, certificate issued and long consultation, showed significant differences in three of four years. For the remaining variables, laboratory test done or ordered and x-ray requested, the differences between trainees and principals reached statistical significance in only one of the four years.

The data were re-analysed adjusting for patient age, sex and reason for consultation to check whether these differences in content and management were an effect of the different case mix seen by trainees and principals (Table 2). Adjusting for case mix reduced the total number of statistically significant differences between trainees and principals from 31 of 40 comparisons to 20, and reduced the number of variables that were significantly dif-

Table 1. Characteristics of patients consulting trainees and principals in 1984–88, and content and length of consultations.

	% of consultations with	
	Trainee (n = 15 621)	Principal (n = 93 404)
Age of patient (years)		
0–11	*21.6*	*14.9* **
12–64	*70.3*	*70.4*
65+	*8.1*	*14.8* **
Sex of patient		
Male	*40.6*	*39.8*
Female	*59.4*	*60.2*
Reason for consultation		
Acute minor	*45.2*	*29.0* **
Acute intermediate	*11.0*	*9.9*
Acute major	*0.8*	*1.2*
Chronic minor	*10.8*	*11.4*
Chronic intermediate	*8.0*	*14.8* **
Chronic major	*2.9*	*7.7* **
Female condition	*6.4*	*8.1* **
Other	*4.0*	*4.9*
2+ reasons	*10.2*	*12.3*
No reason given	*0.6*	*0.8*
Content of consultation		
Patient examined	*75.9*	*71.0* **
Clinical procedure done	*4.6*	*6.8* **
Laboratory test done/ordered	*10.1*	*9.6*
X-ray requested	*2.8*	*2.3* **
New prescription issued	*47.3*	*40.7* **
Repeat prescription issued	*13.5*	*22.3* **
Certificate issued	*7.7*	*9.9* **
Return appointment arranged	*24.2*	*30.0* **
Patient referred	*9.0*	*12.0* **
*Estimated length of consultation (minutes)***		
<6	*38.6*	*46.2*
6–9	*45.0*	*41.2*
>9	*16.4*	*12.7*

n = number of consultations. Difference between trainees and principals: **P<0.01.

Table 2. Odds ratios of trainees against principals for content and length of consultations, by year, before adjusting for case mix and after adjusting for case mix.

	Odds ratio (99% CI) before adjusting for case mix in year				Odds ratio (99% CI) after adjusting for case mix in year			
	1984–85	1985–86	1986–87	1987–88	1984–85	1985–86	1986–87	1987–88
Patient examined	1.26 (1.14 to 1.40)**	1.33 (1.20 to 1.47)**	1.16 (1.04 to 1.28)**	1.38 (1.24 to 1.53)**	1.08 (0.97 to 1.21)	1.04 (0.93 to 1.16)	0.92 (0.83 to 1.03)	1.08 (0.97 to 1.21)
Clinical procedure done	0.85 (0.69 to 1.03)	0.50 (0.40 to 0.63)**	0.57 (0.46 to 0.71)**	0.78 (0.64 to 0.94)**	0.91 (0.74 to 1.11)	0.58 (0.46 to 0.73)**	0.60 (0.48 to 0.75)**	0.88 (0.72 to 1.08)
Laboratory test done/ordered	1.20 (1.04 to 1.40)**	1.01 (0.87 to 1.17)	1.10 (0.95 to 1.27)	0.95 (0.82 to 1.10)	1.32 (1.13 to 1.54)**	1.19 (1.02 to 1.39)**	1.26 (1.09 to 1.46)**	1.09 (0.93 to 1.28)
X-ray requested	1.64 (1.27 to 2.13)**	1.14 (0.86 to 1.50)	1.08 (0.81 to 1.43)	1.19 (0.90 to 1.56)	1.73 (1.32 to 2.25)**	1.20 (0.90 to 1.59)	1.12 (0.84 to 1.50)	1.33 (1.00 to 1.77)
New prescription issued	1.29 (1.17 to 1.41)**	1.38 (1.26 to 1.50)**	1.27 (1.16 to 1.39)**	1.29 (1.18 to 1.41)**	1.10 (1.00 to 1.22)	1.07 (0.98 to 1.18)	1.06 (0.96 to 1.16)	1.04 (0.94 to 1.14)
Repeat prescription issued	0.62 (0.54 to 0.70)**	0.54 (0.47 to 0.61)**	0.54 (0.47 to 0.61)**	0.49 (0.43 to 0.56)**	0.84 (0.73 to 0.97)**	0.81 (0.70 to 0.93)**	0.81 (0.70 to 0.94)**	0.75 (0.65 to 0.86)**
Certificate issued	0.85 (0.72 to 1.01)	0.78 (0.67 to 0.92)**	0.69 (0.58 to 0.81)**	0.72 (0.61 to 0.84)**	0.95 (0.79 to 1.13)	0.88 (0.74 to 1.04)	0.74 (0.62 to 0.88)**	0.82 (0.69 to 0.98)**
Return appointment arranged	0.84 (0.75 to 0.93)**	0.78 (0.71 to 0.87)**	0.73 (0.66 to 0.81)**	0.65 (0.58 to 0.72)**	1.02 (0.91 to 1.14)	1.04 (0.94 to 1.16)	0.95 (0.85 to 1.06)	0.85 (0.76 to 0.95)**
Patient referred	0.78 (0.66 to 0.91)**	0.65 (0.56 to 0.76)**	0.68 (0.58 to 0.80)**	0.81 (0.70 to 0.93)**	0.84 (0.72 to 0.99)**	0.76 (0.65 to 0.89)**	0.79 (0.68 to 0.93)**	0.93 (0.80 to 1.08)
Consultation >9 minutes	1.99 (1.76 to 2.25)**	1.43 (1.27 to 1.62)**	1.17 (1.04 to 1.33)**	1.01 (0.89 to 1.15)	2.46 (2.16 to 2.80)**	1.91 (1.69 to 2.18)**	1.58 (1.38 to 1.80)**	1.32 (1.16 to 1.51)**

CI = confidence interval. Difference between trainees and principals: **$P<0.01$.

ferent in all four years of the study from five to two — repeat prescription issued and long consultation. While issuing a repeat prescription had been identified in the analysis of the unadjusted data, long consultation had not. Two variables, patient examined and new prescription issued, now showed no significant difference between trainees and principals for any of the four years of the study while in the analysis of the unadjusted data both had been significantly different in all four years of the study.

A patient being referred became significant in only three of the years, having previously been significant in all four. Performing a clinical procedure and issuing a certificate both became significant in two of the years having previously been significantly different in three and laboratory test done or ordered became significant in three of the four years rather than the one suggested by the unadjusted data. Return appointment arranged became significant in only one year having previously been significant in all four.

Discussion

The case mix and content of trainee consultations in 62 training practices, the substantial majority of such practices in the north of England, has been studied over a period of four years; this is a much larger study population than any previous study in this field.[2-9] The study confirms the differing case mix of patients seen by trainees and principals: trainees saw more patients with acute minor conditions and fewer with chronic intermediate, chronic major and female conditions. This is consistent with their seeing more children under the age of 12 years and fewer adults aged 65 years and over. This greatly strengthens the results of previous studies.[2-5]

It has also been shown that the differing case mix accounts for many of the apparent differences between trainees and principals in the content of consultations as suggested by the raw data. Adjusting for case mix decreased the differences between trainees and principals over the four years of the study for six of the 10 variables and only two remained as different in all four years. Such an analysis has not been previously reported. Comparing the content of consultations with different doctors, ignoring the effect of case mix, can produce misleading results. For example, it is important to recognize that the only differences between trainees and principals in issuing a new prescription are due to the differing case mix they see. We therefore suggest that case mix should be allowed for in such comparisons in future.

Two variables showed differences between trainees and principals in all of the four years of the study — repeat prescription issued and long consultation. Another two showed no such differences over the four years of the study — patient examined and new prescription issued. For the other six variables the differences were not consistent over the four years and should be interpreted with caution. Although all these differences have been clarified by allowing for case mix, there are two limitations to a study such as this. First, in common with all studies that compare the performance of trainees against another group of doctors,[2-5] it is not clear whose performance is right, trainees or the comparison group, in this case principals. The common assumption is that the work pattern of the established doctor is the norm, though this study cannot support or refute that assumption. Trainees consulting more slowly than principals could represent a more considerate but time consuming consultation style; equally it could represent inefficient use of time owing to inex-

perience. Secondly, as this was a cross-sectional study the results offer no insight into how the activities of trainees change over time, particularly how they deal with patients with chronic illnesses.[9] Although 11% of trainees' consultations were with patients with chronic intermediate or chronic major conditions, we cannot say how often they were seeing these patients. Nevertheless, trainees are exposed to patients with chronic illness; how these opportunities are used to improve the trainees' management of chronic illness is a matter for the individual trainee and trainer. If trainers monitor their trainees' workload[2] there is little need for patients with chronic conditions to be directed to trainees; however, this may have to be done to ensure that trainees see patients with specific chronic conditions.[9]

This study confirms that trainees see patients who are younger than those seen by principals and more likely to be suffering from a condition classified as acute minor. Once these differences are taken into account, however, the clinical content of trainees' consultations is broadly similar to that of principals. Allowing for case mix is an important step in understanding apparent differences in the clinical content of consultations.

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