

Primary care

Identifying predictors of high quality care in English general practice: observational study

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Abstract

Objectives To assess variation in the quality of care in general practice and identify factors associated with high quality care.

Design Observational study.

Setting Stratified random sample of 60 general practices in six areas of England.

Outcome measures Quality of management of chronic disease (angina, asthma in adults, and type 2 diabetes) and preventive care (rates of uptake for immunisation and cervical smear), access to care, continuity of care, and interpersonal care (general practice assessment survey). Multiple logistic regression with multilevel modelling was used to relate each of the outcome variables to practice size, routine booking interval for consultations, socioeconomic deprivation, and team climate.

Results Quality of clinical care varied substantially, and access to care, continuity of care, and interpersonal care varied moderately. Scores for asthma, diabetes, and angina were 67%, 21%, and 17% higher in practices with 10 minute booking intervals for consultations compared with practices with five minute booking intervals. Diabetes care was better in larger practices and in practices where staff reported better team climate. Access to care was better in small practices. Preventive care was worse in practices located in socioeconomically deprived areas. Scores for satisfaction, continuity of care, and access to care were higher in practices where staff reported better team climate.

Conclusions Longer consultation times are essential for providing high quality clinical care. Good teamworking is a key part of providing high quality care across a range of areas and may need specific support if quality of care is to be improved. Additional support is needed to provide preventive care to deprived populations. No single type of practice has a monopoly on high quality care: different types of practice may have different strengths.

Introduction

Quality of care varies in most settings in which it has been studied, including in the United States,¹⁻³ the United Kingdom,⁴⁻⁸ New Zealand,⁹⁻¹⁰ Australia,¹¹⁻¹² and Holland,¹³ and medical errors are a cause of increasing

concern.¹⁴ In the United Kingdom the government has proposed a range of strategies for improving quality in the NHS.¹⁵⁻¹⁷ To respond appropriately to such initiatives it is necessary to understand both the extent of variation in quality of care and its causes, and several authors have examined these relations.¹⁸⁻²⁴ However, data on quality of care are not widely available, especially in primary care. Researchers rely largely on information collected from volunteer practices or on the small amount of routinely available data.

Quality of care is a multidimensional concept,²⁵ and different aspects of quality need different methods of measurement.²⁶ We have previously defined the components of quality of care as a combination of access (whether patients can get to health care) and the effectiveness of clinical care and interpersonal care (whether care is any good when they get there).²⁵⁻²⁷ Within this framework we aimed to assess the extent of variation in quality of care in English general practice and identify factors associated with high quality care.

Methods

Selection of practices

We selected three out of the eight English NHS regions: North Thames, North West, and South West. From each of these three regions we selected two health authorities as being representative of their region in terms of rurality and socioeconomic deprivation. The six health authorities selected were Bury and Rochdale, West Pennine, Enfield and Haringay, South Essex, Avon, and Somerset. Finally, within each of these six authorities we selected a random sample of 10 practices stratified in terms of practice size, training status, and socioeconomic deprivation. When a practice refused to participate, another with similar characteristics was chosen at random and invited to participate; 60 out of 75 (80%) practices that we approached agreed to take part.

Outcome measures

Quality of clinical care: chronic disease management—We used computerised disease registers or prescribing records to select 20 patients in each practice receiving maintenance treatment for each of three conditions: asthma in adults, angina, and type 2 diabetes mellitus.

After confirming the relevant diagnosis from the medical records, we extracted data from medical records to identify aspects of care previously defined by expert panels as being both necessary to undertake and necessary to record for these conditions.²⁸ Criteria used in the analyses are listed in the full version of this paper on the *BMJ's* website.

Quality of clinical care: preventive care—For each practice we sent a questionnaire to the appropriate health authority to collect information on rates of uptake for cervical cytology screening; primary childhood immunisation; measles, mumps, and rubella immunisation; and preschool vaccination.

Patient evaluation: access and interpersonal care—We randomly selected 200 adults from each practice list and sent each patient a copy of the general practice assessment survey.^{29, 30} We used data from these questionnaires to assess the quality of access, continuity of care, and interpersonal aspects of care.

Team climate and team effectiveness—Because of the importance now ascribed to teamwork in general practice, we sent the team climate inventory to all staff employed by the practices³¹; 48 (80%) practices took part in this assessment. The analyses included data from 42 (70%) practices, representing 387 (60%) members of staff. For the analyses reported in this paper we combined the team climate subscales into a single score.

Data analysis

For each criterion for angina, asthma, and diabetes we recorded whether the necessary aspect of care was recorded. We analysed these binary variables with an item response model within a multilevel framework (items within patients).³² For each condition, we calculated a score for each practice. Higher clinical scores (maximum = 100) reflected better clinical care measured with evidence based process measures.

We then used the scores for angina, asthma, diabetes, preventive care, access, continuity, and interpersonal care as dependent variables in a series of backwards stepwise regression models to identify predictors of high quality care. Clinical scores at the level of the patient were analysed with a multilevel model to account for the potential of clustering within practices. We analysed the scores from the survey of patients within a survey framework to allow for clustering, by using an ordered logistic regression model. We analysed the indicators for preventive care by looking at the achievement of higher target rates (90% for immunisations, 80% for cervical cytology) with logistic regression. All analyses were undertaken with Stata.

We regressed a common set of independent variables on each dependent variable. These independent variables were practice size (based on whole time equivalent general practitioners), routine booking interval for consultations (5 minutes, 7.5 minutes, 10 minutes), overall team climate, and deprivation score.

Results

Quality of clinical care: chronic disease management

Variation in quality of chronic disease management—Data were collected in all 60 practices. Table 1 summarises practice scores for these and other variables.

Table 1 Variations in quality of care: summary clinical, access, and interpersonal scores (maximum=100)

Dependent variable	Mean score	Standard deviation	Range	Intracluster correlation coefficient
Angina	55.0	6.74	41-67	0.14
Asthma	50.1	12.33	25-73	0.30
Type 2 diabetes	62.1	11.84	33-83	0.37
Access	60.7	9.21	44-79	0.079
Continuity of care	66.5	11.07	42-87	0.081
Treatment by receptionists	68.2	9.19	45-85	0.057
Communication	72.0	6.34	60-88	0.025
Interpersonal care	69.2	6.84	50-83	0.030
Doctor's knowledge of patient	59.1	7.10	43-76	0.028
Nursing care	75.8	7.71	48-88	0.015
Overall satisfaction	74.7	5.93	59-88	0.022

Table 2 Variations in quality of care: summary of scores for prevention

Preventive care indicator	No (%) of practices
Primary childhood immunisation: target achieved (90%)	44/49 (90)
MMR vaccine at 13 months: target achieved (90%)	27/44 (61)
Child preschool booster (excluding MMR): target achieved (90%)	35/48 (73)
Preschool MMR booster: target achieved (90%)	22/42 (52)
Uptake of cervical cytology: target achieved (80%)	44/49 (74)

MMR=measles, mumps, and rubella.

Predictors of quality of chronic disease management

Compared with practices with five minute consultation booking intervals, practices with 10 minute booking intervals had higher scores for all three chronic diseases. Mean scores in practices with routine 10 minute booking intervals, adjusted for different pools of patients in different practices and the fact that many items were conditional variables that did not apply to all patients, were 10.0 points higher for diabetes (95% confidence interval 1.06 to 18.95, $P=0.028$), 10.2 points higher for angina (3.83 to 16.58, $P=0.002$), and 21.6 points higher for asthma (12.30 to 30.91, $P<0.001$) than in practice with five minute intervals. For diabetes, two other variables were significantly associated with differences in quality of care. Larger practices had higher scores for diabetes than did smaller practices (adjusted difference 2.16 (0.22 to 4.10), $P=0.029$), as did practices where staff reported better team climate (2.37 (0.36 to 4.38), $P=0.021$).

Quality of clinical care: preventive care

Complete data for all five indicators were available for 42 (70%) practices (table 2). Practices in deprived areas had lower uptake rates for cervical cytology—odds ratio 0.65 (0.48 to 0.89, $P=0.008$). Preventive care and other practice variables showed no significant independent associations.

Access and interpersonal aspects of care

Copies of the general practice assessment survey were sent to 11 831 patients, and 4493 (38%) were returned after, for most practices, two reminders.

Smaller practices had higher scores for access (adjusted odds ratio 0.87 (0.76 to 0.99), $P=0.038$), as did practices where the staff reported better team climate (1.23 (1.09 to 1.38), $P=0.001$). Practices with higher scores for team climate also had higher scores for continuity of care (1.33 (1.18 to 1.50), $P<0.001$).

Small practices had higher scores on the receptionist scale (0.82 (0.74 to 0.90), $P < 0.001$), as did practices with fewer deprived patients (0.88 (0.83 to 0.94), $P < 0.001$). More deprived practices had lower scores for interpersonal care (0.92 (0.86 to 0.98), $P = 0.015$) and overall satisfaction (0.90 (0.82 to 0.98), $P = 0.019$). Practices where the staff reported better team climate also had higher scores for satisfaction (1.11 (1.05 to 1.19), $P < 0.001$).

Discussion

The findings of this study confirm that English general practice varies widely in quality of care, as measured from a range of perspectives. Our findings highlight the importance of assessing quality of care with a range of measures, as each approach illuminates different aspects of quality of care.

Predictors of quality of care

Four variables stood out as predictors of quality of care. The largest effect was the relation between the booking interval for routine consultations and the quality of management of chronic disease. Other authors have emphasised the importance of adequate time for consultations.²³ The effect was greater for asthma than for diabetes and angina, possibly because the last two conditions are more likely to be treated in separate clinics than in routine surgeries. These data provide strong support for the view that general practice should be structured to allow time for the increasing complexity of the work required of general practitioners.

Secondly, we found significant associations between size of practice and quality of care, as has been seen in other studies,^{19–24} although the relation was not simple. Smaller practices scored better than larger ones for access to care, but for diabetes care larger practices had higher scores than smaller ones. This emphasises that no single type of practice has a monopoly on high quality care—different types of practice may have different strengths. This is an important finding at a time when small practices in the United Kingdom are coming under particularly close scrutiny from the government.³³ As others have found, there may be a trade-off between high quality clinical care and interpersonal care.³⁴

Thirdly, deprivation predicted poorer uptake of preventive care, highlighting that quality of care in general practice is influenced by environmental factors.^{18–35} Preventive care is one area in which patients' actions influence the quality of care that can be provided. In other areas where practices had the main control, no significant associations between deprivation and quality of care were found.

Finally, team climate was associated with quality of care for diabetes care, access to care, continuity of care, and overall satisfaction. This was the only variable that was associated with high quality care across a range of aspects of care. The associations are not necessarily causal: it is possible, for example, that staff felt better in practices where good care was given because they received fewer complaints from patients. However, the measure of team climate is intended to reflect how people actually work together and how much support is given towards maintaining high standards of care.

What is already known on this topic

Quality of care varies in virtually all aspects of medicine that have been studied

Most studies look at quality of care from a single perspective or for a single condition

What this study adds

Quality of care varies for both clinical care and assessments by patients of access and interpersonal care

Practices with longer booking intervals provide better management of chronic disease; preventive care is less good in practices in deprived areas

No single type of practice has a monopoly on high quality care—small practices provide better access but poorer diabetes care

Good team climate reported by staff is associated with a range of aspects of high quality care

High quality care in general practice needs effective teamwork, and this is emphasised in the awards of the Royal College of General Practitioners, which assess the performance of practice teams rather than individuals.

Limitations of the study

Although this is one of the most comprehensive surveys of quality of care in British general practice, the study looked at only limited aspects of overall quality. For example, the clinical data represented only three chronic conditions, a small part of the clinical work undertaken in general practice. Ongoing work by three of the authors (SC, MR, JH) has developed, and is currently field testing, clinical indicators for 19 common conditions presenting in general practice in the United Kingdom.³⁶

The clinical scores were derived from information available only from medical records. Although the expert panels that derived the review criteria selected only aspects of care that they believed needed to be recorded,²⁸ a considerable gap may still exist between what doctors do and what they record.³⁷ Although there is evidence from the United States that quality of record keeping is positively correlated with quality of care,^{38–39} similar analyses have not been carried out in the United Kingdom.

This study confirms that wide variation in the quality of care exists in English general practice. The study also identifies important predictors of high quality care that need to be considered as general practice is restructured to meet the needs of the 21st century.

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A memorable dinner companion Doctors' honours

The heavy, gilt edged, embossed italic card specified evening dress and decorations, so I donned white tie and tails, with my sole lapel miniature the general service medal (Malaya). The table plan put me next to Sir Cecil Wakeley Bt KBE CB FRSE FRCS honFRCS FFR FRCSI FRACS LID DSc (1892-1979). He reminisced over his long career and was glad we had only three courses and wines instead of double that number as in the first half of the 20th century. I explained that I had complained (fruitlessly) in the newsletter of my college that it served white bread and butter, fatty meats, rich puddings, cream, and cigars. Wakeley had been editorial secretary of the *British Journal of Surgery* from 1942 to 1972, and he rejoiced that the qualitative anecdotal case reports, series, and polemics ("In my experience...") had been replaced by quantitative papers testing hypotheses, even if the journal's pages were now spattered with mysterious P_s (probability values).

Wakeley's main worry was the sharp decline in public esteem of the medical profession. I disagreed, citing opinion polls that the public put their trust, above every calling, in doctors, whereas our principal calumniators, journalists and politicians, were distrusted totally.

"But I said esteem, Baron, not trust?"

"How, Sir Cecil, do you measure esteem?"

"Easy, Baron, the honours list. Twice a year when I was PRCS [1949-54] we took Attlee our list: 'We'd like a peerage for him, a baronet, Ks for this half dozen, and then some CBEs and OBEs.' Now, Baron, look around you at this distinguished medical banquet, and you'll see hardly even a K, because honours today go to captains of industry and civil servants, who therefore no longer hold our profession in its former esteem."

Did Wakeley win this rally? I waited until I could compare the honours lists for surgeons in 1949 and half a century later. In 1949 five surgeons were knighted, and eight were CBEs or CMGs. In 1999 there were two surgical knight/dames and two CBEs. All the presidents of the college of surgeons between 1940 and 1965 became peers or baronets, but since 1966 only one PRCS was ennobled; the others got a K. In the recent birthday honours only one of the 25 new knights bachelor was from health care, and he was a chairman of a regional office of the NHS Executive. Game, set, and match to Sir Cecil.

Jeremy Hugh Baron *honorary professorial lecturer, Mount Sinai school of medicine, New York*