The effects of interactions between patient characteristics on patients' opinions of general practice care in eight European countries

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The literature shows that patients' positive opinions of general practice care are associated with being older, of lower educational level, lower social status and being married, but there is no association with the sex of the patient. The health related characteristics of patients, such as self-reported health status, chronic condition and utilization of care, also predict judgements of the quality of some aspects of general practice care. This study investigated whether, in addition to individual effects, combinations of patient characteristics can also influence opinions of care, and whether these findings are valid in different European countries.

A self-completion questionnaire was developed and given to consecutive patients in five general practices in each of eight European countries. There were 48 questions covering five aspects of care: availability and access, organisation and co-operation, medical care, relationship and communication, information and support and an overall opinion. There were a further 16 questions on patient characteristics. One way analysis of variance, using SPSS software, was used to compare mean scores for each aspect of care for different values of the patient characteristic. Multivariate analysis was used to investigate the interaction effects between pairs of patient characteristics, which, individually were found to influence opinion. Further tests were made to identify any interaction between the effect of each patient characteristic and the country of residence.

1008 (response rate 63%) questionnaires were completed. The patient characteristics which influence patients' opinions were found to be age, levels of education and professional qualification, length of relationship with the practice, and whether they have a chronic condition. However, there are no interaction effects between these characteristics. Importantly these effects were found to be valid in all countries in this study. The patient characteristics which do not appear to influence opinions of care are sex, levels of utilization of care and self-reported health status.

When surveying opinions of patients about general practice care, since patients of different characteristics will give different views of the same service, the sample of patients whose views are surveyed should aim to account for these predictable differences. Decisions on changes in care provision should be based only on the results of patient opinion surveys in which the characteristics of the sample of patients responding to the survey were taken into account.

Key words: general practice; family medicine; patient characteristics; patient opinion

Introduction

Patient opinions are recognized as a valid measure of the quality of general practice care (Wensing *et al.,* 1994). Many surveys are conducted to gather patients' opinions of their general practice care to guide the selection of improvements to be made, although the quality of the instruments used varies widely (Hearnshaw *et al.,* 1996). The literature on the relationship between patients' opinions of medical care and different sociodemographic characteristics of patients has given many conflicting results, but a systematic review and meta analysis (Hall *et al.,* 1990) has summarized the evidence. In general, sociodemographic characteristics are only minor predictors of satisfaction with medical care, but nevertheless are important. The overall trend is that slightly greater satisfaction is associated with being older, of low educational level, lower social status and being married, but there is no association with the sex of the patient. The health related characteristics of patients, such as self-reported health status, chronic condition and utilization of care, have also been shown, by both a literature review and regression analysis on empirical data, to predict judgements of the quality of some aspects of general practice care (Wensing *et al.,* 1997).

It is likely that, if these characteristics of patients can influence opinions of care, then the combination of certain characteristics may differentially influence opinions of care. For example, for patients who have a chronic condition, the effect of age on their opinion may be greater than it is on those who do not have a chronic condition. Alternatively, for patients who have poor health status, the effect of their age on their opinion may be greater than it is for those of good health status. A further potential influence on opinions of care is the country or health care system in which the care is provided. For example, for patients in country A the effect of age on their opinion may be greater than it is for patients in country B. This study investigated the effect of interactions between patient characteristics and their opinions of general practice care.

If the interactions between the different characteristics of patients and their opinions of care can be catalogued in this study, then users of patient opinion surveys will be informed about the necessary stratification of samples of patients. They will know how to take account of the differing views of patients with different combinations of characteristics. The likelihood of having a biased sample can thus be reduced and the validity of results can be increased.

Methods

A validated questionnaire was created, based on the priorities of patients in eight European countries (Grol *et al.,* 1999). The questionnaire asked patients to score 48 questions on scales of five categories, numbered 1 to 5 with the end categories labelled 'poor' and 'good'. 46 questions covered five aspects of care: availability and access (seven questions), organization and co-operation (nine questions), medical care (nine questions), relationship and communication (11 questions), information and support (ten questions). The final two questions were on overall opinion. There were a further 16 questions on patient characteristics. The questionnaire was translated from a source version in English into the language of each participating country, following a systematic translation process (Grol *et al.,* 1999) and subsequently refined and developed into the shorter EUROPEP instrument (Wensing *et al.,* 2000).

In each country, a sample of 200 patients was sought, from a stratified sample of four or five general practices. The practices were stratified by rural or urban setting and number of general practitioners. Consecutive patients, consulting the general practitioner, were given the questionnaire with a reply paid envelope to mail it directly back to the research team in each country. The inclusion criteria for patients were that they should be 18 years or older, literate in the language of the country and the general practitioner had no medical reason to exclude them.

The data were collected in each country and entered in to a pre-prepared SPSS file, then sent

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to the co-ordinating centre for data cleaning and aggregation before analysis. The analysis reported here focused on the relationships between the mean scores for each of the five aspects of care, as dependent variables, and the independent variables of nine patient characteristics. The five sociodemographic characteristics were age, sex, country, education level, and professional qualification level, and the four health related characteristics were health status, utilization of care services, length of relationship with the practice and having a chronic condition. The values for each characteristic were categorised (see Table 1). A series of univariate analyses of variance, using SPSS software, compared mean scores for different values of each patient characteristic. These analyses were used to identify those characteristics which do, individually, influence scores. Those characteristics were incorporated in a model which tested for any effects from combinations of characteristics.

A series of multivariate analyses, using SPSS general linear modelling, investigated whether the profiles of scores over the five aspects of care varied according to combinations of patient characteristics. In these analyses, the five aspects of care served as within-subject, dependent variables, and combinations of patient characteristics served as between-subject, independent variables. The area of analysis of most interest was the combined effect of two independent variables on the profile of scores for the five aspects of care. This was the multivariate analogue of a two-way interaction effect. In all analyses, the effects of additional patient characteristics, that were found in the comparison of means to influence patients' opinions, were controlled for.

Results

The response rate to the questionnaire was 1008 out of 1600 questionnaires issued (63%). The patient characteristics were derived as shown in Table 1. The sample numbers for each characteristic are also shown in Table 1. Table 2 gives the number of responses for each country.

The results of the comparison of means, tested by one-way analysis of variance, are shown in Table 3. It can be seen that six patient characteristics of age, country, education level, professional qualification level, length of relationship with the practice and having a chronic condition each, individually, influenced the scores given by patients. The direction of differences in mean scores between categories of patients were identified using post-hoc Tukey analysis in SPSS. These six variables were then incorporated into the generalized linear model used to investigate the effect on scores of combinations of patient characteristics. The three patient characteristics of sex, health status, and utilization of care services were not found to influence the scores given and, therefore, were not included in the model.

The profiles of the scores given, over the five aspects of care, were investigated for evidence of interaction effects between all possible pairs of five of the patient characteristic variables. The sixth variable, country, was controlled for as an additional between-subject factor, but was not included as a potential interaction variable in this analysis. This was because there was one country which had a very low number of responses and one country which did not collect data on the characteristics of educational level and professional level. To address this, a separate analysis was used for interaction effects on the dependent variable overall score, between country and the other variables. Sensitivity analyses were conducted for the effect of inclusion of these two countries.

Table 4 shows there were no significant interaction effects on profiles of patients' scores found between any of the pairs of the five patient characteristic variables investigated. Table 5 shows there were no significant interaction effects between the patient characteristic of country and any other characteristic variable when data from all countries were included. There were also no significant interaction effects found when Portugal was excluded, nor when Finland was included but the variables education level and professional level excluded from the model.

Discussion

This study shows that, when surveying opinions of patients about general practice care, patients of different characteristics will give different views of the same service. This confirms previous published findings. One important additional finding is that there were no effects of interactions between patient characteristics on their rating of care. This

Table 1   Categories derived for each patient characteristic variable

Characteristic	Question on questionnaire	Derived value	Number (%) in each category (N=1008)
Age	What year were you born?	Young = under 40 years Middle = 40 to 65 years Old = over 65 years	308 (31.2) 423 (42.9) 255 (25.9)
Sex	Are you male or female?	M = male F = female	319 (32.4) 665 (67.6)
Education level	What is your highest level of education? Please tick the highest level. 6. categories were listed from the EC standard lists for each country 7. other	Low = category 1 Medium = category 2 or 3 High = category 4, 5 or 6 Category 7 omitted	306 (39.6) 321 (41.5) 146 (18.9)
Professional qualification	What is your highest professional education? Please tick the highest level. 6. categories were listed from the EC standard lists for each country 7. other	Low = category 1 Medium = category 2 or 3 High = category 4, 5 or 6 Category 7 omitted	137 (20.2) 289 (42.7) 251 (37.1)
Health status	In general, I would say that my health is: Excellent very good good fair poor	High = excellent or very good Medium = good Low = fair or poor	266 (27.4) 352 (36.3) 352 (36.3)
Utilization of care	How many times have you seen the general practitioner that you usually see over the last 12 months? PLUS How many times have you been an inpatient in hospital during the last 12 months? PLUS How many times have you been seen by a specialist or hospital doctor during the last 12 months (as an outpatient)?	Sum of the numbers Low = less than 3 times Medium = 4 to 12 times High = more than 12 times	282 (31.1) 463 (51.0) 162 (17.9)
Length of relationship with the practice	How long have you been a patient at the practice you usually visit? Number of years	Short = less than 2 years Medium = 2 to 10 years Long = more than 10 years	198 (22.1) 500 (55.9) 196 (21.9)
Chronic condition	Do you have any of these illnesses? Diabetes Long-term severe respiratory illness Heart and blood vessel diseases Stroke High blood pressure Chronic digestive problems Musculo-skeletal illness Chronic headache (e.g., migraine) Psychiatric illness (e.g., depression) Malignant disease (e.g., cancer, leukaemia) Other long-term disease	1 = yes to any of the list 0 = no to all of the list	669 (66.4) 339 (33.6)

suggests that the influence of each characteristic is independent of the presence or absence of the other characteristics. A further important finding is that all these results are valid in all the eight European countries included in this study.

We have answered the example questions we posed in the introduction. For patients who have a chronic condition, the effect of age on their opinion of general practice care is not any greater than it is on those who do not have a chronic condition.

Table 2   Number of responses for each country

Country	Number (%) of valid responses
Denmark	168 (17)
Germany	125 (12)
Finland	104 (10)
Netherlands	142 (14)
Norway	157 (16)
Portugal	35 (4)
Sweden	160 (16)
United Kingdom	117 (12)
Total	1008

Table 3   Direction of differences of mean scores for patients with different characteristics

	Differences found	Direction of differences
Sociodemographic characteristics		
Age	Y	Higher age, higher score
Sex	N	
Country	Y	Multiple differences
Education level	Y	Higher education level, lower score
Professional qualification level	Y	Higher professional level, lower score
Health related characteristics		
Health status	N	
Utilization of care	N	
Length of relationship with the practice	Y	Longer relationship, higher score
Chronic condition	Y	Chronic condition present, higher score

For patients who have poor health status, the effect of their age on their opinion is not greater than it is for those of good health status. For patients in country A, the effect of age on their opinion is not greater than it is for patients in country B.

One implication of these results is that, when the results of patient opinion surveys are used to inform decisions on changes to be implemented, the characteristics of the sample of patients responding to the survey should be taken into account to avoid errors in interpretation of the results. Age, chronicity, education level, professional level, and length of relationship with the practice, should each be considered in the selection of the sample of patients for a survey. However, there is no need to consider interactions between these characteristics as affecting the opinions given in a significant way. The degree to which these characteristics of the sample need to be addressed will vary depending on the purpose of the survey.

Our results for individual sociodemographic characteristics (Table 3) confirm previous findings on the predictive value of these characteristics (Hall *et al*. 1990). Older patients rated general practice care higher then younger patients. Less highly educated patients rated their care better than more educated patients. Patients who are less highly professionally qualified rated their care better than more highly qualified patients. On the other hand there were no differences found between ratings by males and females. There were many differences between the ratings given by patients from different countries, for particular aspects of care. These were investigated in more detail in a further study and will be reported elsewhere (for example, Grol *et al.,* 2000).

Our results for health related characteristics are also in accord with Wensing *et al.* (1997). Patients with a long time relationship with the practice give higher ratings than patients with a shorter relationship. Patients with chronic conditions give higher ratings than those without. However, there were no differences found in ratings between patients of high and low utilization of health care or between patients of low or high health status. These confirmations of previous findings suggest the representativeness of the samples of patients in this study was at least as high as that in previous studies and thus that our results are at least as generalizable.

It is not yet known (Hall *et al.,* 1990) whether the differences of opinions of patients with different characteristics indicate that the judgements are independent of the quality of care provided. For example, perhaps older patients are more generous than younger patients in judgements of everything, or more educated patients have higher expectations of all services they receive and so rate them more harshly than less well educated. Alternatively, the differences in judgements could be due to differences in experiences because older patients actually receive better care or more educated patient

Table 4 Two-way interaction effects between pairs of 5 patient characteristics on the profiles of scores on 5 aspects of care*

First interaction variable	Second interaction variable	Exact F(df,error df)	Wilks lambda	Significance, p
Age	Education level	F(161488) = 1.290	0.959	0.195
Age	Professional qualification level	F(161488) = 1.033	0.967	0.417
Age	Length of relationship with the practice	F(161488) = 1.156	0.963	0.297
Age	Chronic condition	F(8974) = 0.526	0.991	0.837
Education level	Professional qualification level	F(161488) = 1.494	0.953	0.094
Education level	Length of relationship with the practice	F(161488) = 1.123	0.964	0.327
Education level	Chronic condition	F(8974) = 0.839	0.986	0.568
Professional qualification level	Length of relationship with the practice	F(161488) = 0.743	0.976	0.751
Professional qualification level	Chronic condition	F(8974) = 0.470	0.992	0.878
Length of relationship with the practice	Chronic condition	F(8974) = 0.333	0.995	0.953

*A generalized linear model was used in SPSS. The additional between-subject factor, which was controlled for, was Country.

Table 5 Two-way interaction effects between variable Country and five other patient characteristics*

First interaction variable	Second interaction variable	Significance, p		
		All countries and variables	Country 6 excluded	Education and professional levels excluded
Country	Age	0.968	0.945	0.965
Country	Length of relationship with the practice	0.633	0.600	0.715
Country	Chronic condition	0.172	0.129	0.768
Country	Education level	1.000	0.999	
Country	Professional qualification level	0.555	0.458	

*A generalized linear model, which also included Main Effects for each variable, was used in SPSS.

receive less good care. Evidence to support these explanations has not yet been presented. Nevertheless, when using patient opinions to determine the need for changes in care provided, such speculations should be carefully considered.

For example, suppose a general practice is making a decision between using scarce resources on improving either the antenatal clinic (mostly younger patients) or the diabetic clinic (mostly older patients). In a survey of patients' opinions, the latter can be predicted to get slightly better ratings than the former,

just because the responders to the survey are older, have been attending that practice for a long time, and they have a chronic condition, but not necessarily because the clinic needs less improvement.

In summary, the patient characteristics, investigated in this study, which influence opinions of patients, about general practice care, are age, country, education level, professional qualification level, length of relationship with the practice, and whether they have a chronic condition. Samples of patients in patient opinion surveys of general

practice should be stratified to represent these characteristics adequately. These factors have their effect independently of each other and there are no effects due to interactions between them. Thus, the stratification can treat each characteristic as independent of the others. On the other hand, the patient characteristics which do not influence opinions are sex, health status and levels of utilization of care. Samples of patients do not need to be stratified on these characteristics.

The need for further research is to quantify the differences in opinions of patients of different characteristics and clarify the reasons for such differences.

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