Bias in patient assessments of general practice: General Practice Assessment Survey scores in surgery and postal responders

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SUMMARY
Patient-based measures of the quality of primary care are increasingly important. However, their effective use requires bias to be minimised. Scores on the General Practice Assessment Survey (GPAS) differ according to whether patients are surveyed in the surgery or by post. It is not clear whether these differences relate to the mode of administration or to the types of patients who complete the scale in postal and surgery samples. Regression indicates that the bias reflects both effects and should be considered when GPAS scores are being interpreted.
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Introduction

PATIENT assessments of primary care are important for quality improvement, and the popularity of questionnaires completed by patients has led to interest in aspects of questionnaire design and administration and their relationships to bias, i.e. systematic under- or over-estimation.[1]

One popular questionnaire is the General Practice Assessment Survey (GPAS).[2] The GPAS has been used in surveys of surgery attenders[3] and in postal surveys of practice populations.[4] Scores in surgery responders are about 5% higher overall, but rise to 10% on the receptionist scale,[5] which may have important implications for the interpretation of data.

These differences may relate to task effects (differences related to the context in which the questionnaires are completed; for example, by postal and surgery responders), or to selection effects (relating to differences in the sociodemographic nature of surgery and postal samples). Age, ethnicity, and socioeconomic status are associated with GPAS scores.[3]

This study examined these two hypotheses by determining whether the scores of surgery and postal responders differ when sociodemographic differences are statistically controlled.

Method

The full GPAS dataset included 21 905 patients, 56.8% of whom were responders from surgeries. Data from postal surveys involved random samples from practice lists, while surgery samples involved questionnaire administration by practice staff to consecutive surgery attenders. Only those GPAS scale items present in versions 1 and 2, i.e. access, receptionists, continuity, communication, personal care, knowledge of the patient, nursing, and general satisfaction, were analysed (Figure 1). All except one of the GPAS assessment items use a six-point response format, ranging from 'very poor' to 'excellent'. For reporting purposes scale scores (between zero and 100) are calculated as a percentage of the maximum possible score.[6]

The following sociodemographic characteristics were used in the analysis: chronic illness ('yes' or 'no'); sex; age; ethnic minority ('white' or 'other'); and accommodation ('owner-occupier' or 'other'). Responders under the age of 16 years were excluded. Patients for whom there was missing data on any of the study variables (the GPAS scales or the demographic variables) were excluded, to provide a

HOW THIS FITS IN

What do we know?

Questionnaire design and administrative factors may be associated with bias in responses. Therefore, understanding the nature and magnitude of the bias is important for effective interpretation of patient-based measures of the quality of primary care. One important bias may relate to differences between practice populations surveyed by post and those surveyed while attending surgery.

What does this paper add?

Postal and surgery responders to the General Practice Assessment Survey (GPAS) differ in sociodemographic characteristics, with the characteristics of surgery responders more likely to be associated with lower GPAS scores. However, completion in the surgery is associated with higher scores on all subscales.

consistent sample size for analyses. However, because a significant proportion of patients had not consulted a nurse, a reduced dataset was used for the analysis of the GPAS nursing scale.

Analysis

To determine the effect of surgery and postal administration, multiple regression (using SPSS version 9) was used to examine the relationship between type of administration and GPAS scale scores, controlling for sociodemographic differences. All variables were entered into the regression simultaneously. The unstandardised regression coefficient relating to the binary administration variable (i.e. surgery or postal) estimated the difference in scores on each GPAS scale between surgery and postal responders, holding all other demographic factors constant.[7] GPAS scale scores are generally negatively skewed, which can influence multiple regression. Although transformations were attempted to reduce skew, these had little substantive effect on the results.

Included scales	Item	Content
Access	8	Convenience of practice location, hours for which practice is open for appointments, time taken to get an appointment with the usual or any doctor, availability of urgent appointments, waiting times for consultations, ability to contact practice by phone, ability to speak to the doctor on the telephone
Receptionists	1	Quality of treatment by the receptionists
Continuity	1	How often appointments are with the usual doctor
Communication	4	Thoroughness of history taking, how well doctor listens to what the patient says, how well the doctor explains health problems or treatments, how often patient leaves surgery with unanswered questions
Interpersonal care	3	Amount of time doctor spends with patient, doctor's patience with questions or worries, doctor's caring and concern
Knowledge of patient	3	Doctor's knowledge of medical history, knowledge of what worries the patient about their health, knowledge of the patient's responsibilities
Practice nursing	3	How well nurses listen to the patient, the quality of care they provide, how well nurses explain health problems or treatments
Satisfaction	1	How satisfied patient is with the practice overall

Figure 1 Scales in the GPAS. The following scales were excluded from the analysis: referral (report item only); enablement (GPAS version 2 only); trust; technical competence; and co-ordination (GPAS version 1 only).

Table 1. Differences between postal and surgery responders.

Item on GPAS scale	Surgery mean (n = 7051)[a]	Postal mean (n = 6483) [a]	Unadjusted difference (95% CI)	Adjusted difference[b] (95% CI)
Access	65.1	62.4	2.7 (2.1–3.3)	4.1 (3.4–4.7)
Receptionists	77.3	69.6	7.7 (6.9–8.5)	8.6 (7.8–9.4)
Continuity	70.2	66.9	3.3 (2.5–4.1)	4.5 (3.6–5.3)
Communication	77.3	74.3	3.0 (2.4–3.7)	3.6 (2.9–4.3)
Personal care	72.6	71.1	1.5 (0.8–2.2)	2.3 (1.5–3.0)
Knowledge of the patient	64.8	59.9	5.0 (4.2–5.7)	5.2 (4.4–6.0)
Nursing	77.2	76.8	0.4 (-0.4–1.2)	1.3 (0.5–2.1)
General satisfaction	80.9	77.7	3.2 (2.6–3.9)	3.9 (3.2–4.5)

[a]Sample size for analysis of nursing scale is 4088 (surgery) and 3886 (postal). [b]Adjusted for chronic illness, sex, age, ethnic minority, and accommodation status. CI = confidence interval.

Results

The included sample size was 13 534, 61.8% of the total dataset, with 56.6% of surgery responders and 68.6% of postal responders included. Included and excluded patients were compared on demographic characteristics where these were recorded (n = 16 223). Comparisons indicated that patients who were included were more likely to be white (86.4% versus 81.4%), owner-occupiers (63.9% versus 57.3%), and chronically ill (37.6% versus 33.4%), but did not differ in sex (62.8% female versus 61.2%) or age (mean age = 46.8 years in both groups).

Analysis of demographic differences between postal and surgery responders indicated that surgery responders were more likely to be younger (mean age = 44.3 years versus 49.5 years), female (65.0% versus 60.4%), from an ethnic minority (20.6% versus 6.0%), to have a chronic illness (44.4% versus 30.2%) and less likely to be owner-occupiers (54.4% versus 74.2%).

Table 1 shows the mean scores for each GPAS scale, the unadjusted difference between postal and surgery responders, and the difference derived from the multiple regression (i.e. the unstandardised regression coefficient), controlling for demographic factors. In all cases, the adjusted difference was greater than the original difference.

Discussion

GPAS scores are higher (i.e. more positive) in surgery than postal responders. The data suggests that the differences between surgery and postal responders relate both to a response set issue and to a selection effect. Generally, administering GPAS in the surgery accesses patients who are more likely to be in those groups associated with lower GPAS scores, i.e. from an ethnic minority, less affluent, and younger.[3] When these effects are held constant, the bias towards higher scores in surgery responders is increased.

This study cannot determine the cause of the bias. Given that the bias is largest in the receptionist scale, and that reception staff are often involved in distributing questionnaires,[2] patient concerns about confidentiality may result in socially desirable responses (i.e. more positive assessments), similar to the bias that is potentially found in face-to-face interviews.[1]

The substantive significance of these differences is unclear. According to the GPAS manual,[5] practices should be highlighted if they have scores 10 points above or below the mean in the locality. Only the bias in the receptionist scale approached this magnitude. Nevertheless, any bias may be important if it is in addition to modest (though real) differences in patient assessments that result in a practice being identified as an outlier.

It should be noted that the current results do not necessarily suggest that postal administration is superior in all cases. However, researchers using patient assessments will need to be aware of the biases associated with differences in administration when interpreting data.

References

1. McColl E, Jacoby A, Thomas L, *et al.* Design and use of questionnaires: a review of best practice applicable to surveys of health service staff and patients. *Health Technol Assess* 2001; **5(31)**.
2. Ramsay J, Campbell J, Schroter S, *et al.* The General Practice Assessment Survey (GPAS): tests of data quality and measurement properties. *Fam Pract* 2000; **17:** 372-379.
3. Campbell J, Ramsay J, Green J. Age, gender, socioeconomic, and ethnic differences in patients' assessments of primary health care. *Qual Health Care* 2001; **10:** 90-95.
4. Campbell S, Hann M, Hacker J, *et al.* Identifying predictors of high quality care in English general practice: observational study. *BMJ* 2001; **323:** 784-787.
5. Roland M. *General practice assessment survey (GPAS-2) manual.* Manchester: National Primary Care Research and Development Centre, University of Manchester, 2002.
6. www.gpas.co.uk
7. Tabachnick B, Fidell L. *Using multivariate statistics.* Boston: Allyn and Bacon, 2001.

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