Patient satisfaction with out of hours primary medical care

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Abstract

***Objectives*—To describe the relationship between patient satisfaction with out of hours care provided by deputising and practice doctors in four urban areas in England and characteristics of the service provided and patients, the care given, and health outcomes.**

***Setting*—Fourteen general practices in four urban areas in England.**

***Participants*—People who requested out of hours care.**

***Design*—Analysis of data from a study of out of hours care. Patients were interviewed within 5 days of their request for out of hours care. Data on the service provided were obtained from medical records and all other data were collected at interview. Satisfaction was measured using a valid reliable instrument.**

***Results*—2152 patients were recruited to the study and 1466 were interviewed. Satisfaction data were available on 1402 patients. "Overall satisfaction" was associated with age, doctor type, lack of access to a car at the time of the request, and health outcome. The relationships between satisfaction subscales and patient characteristics (age, sex, ethnicity, and access to a car at the time of the request), service characteristics (doctor type and delay between the request and visit), whether a prescription was given, and health outcome were variable. If an expected home visit was not received, "overall satisfaction" and satisfaction with "communication and management", "doctor's attitude", and "initial contact person" were reduced.**

***Conclusion*—Patient satisfaction is dependent on many factors. Mismatch between patient expectation and the service received is related to decreased satisfaction. This may increase as general practitioners delegate more out of hours care to cooperatives and deputising services.**

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Keywords: patient satisfaction; out of hours care; general practice

Key messages

- Patients who are more likely to express low overall satisfaction with out of hours care are younger, do not have access to a car, expect but do not receive domiciliary care, have worse health outcomes, receive care from a deputising service, and experience longer delays between request and care.
- There is no consistent evidence for an association between overall satisfaction with out of hours care and sex, ethnicity, receipt of prescription, whether or not the doctor is a GP principal, and the time of day when care is requested.
- Non-white people are less satisfied with interpersonal aspects of out of hours care and women are less satisfied with continuity of care.

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Patient satisfaction with medical care is a measure of patient perception of the quality of that care.[1] Its importance as an outcome of health care is now accepted and its measurement is being encouraged.[2 3] Nevertheless, quantitative measurement of patient satisfaction is problematic[4] because, unless sensitive, reliable, valid satisfaction questionnaires are used, the veracity of the findings will be uncertain. Although the development of these instruments is a demanding task, a number have been published which examine patient satisfaction with different aspects of primary medical care in the UK.[5–9]

Between 1982 and 1988 several studies of patient satisfaction with out of hours care provided by deputising services and practice doctors were published but satisfaction questionnaires with established reliability and validity were not used.[10–13] More recently a reliable and valid satisfaction questionnaire was used in a prospective randomised controlled trial comparing out of hours care provided by practice and deputising doctors[14] and, in a modified form, in an evaluation of out of hours care provided by out of hours cooperatives and deputising services[15] and practices, cooperatives, and deputising services in single geographical areas.[16]

These studies provide some information on the relationship between patient, service and care factors, and satisfaction (table 1). Nevertheless, the studies by Salisbury[15] and by Shipman *et al*[16] were undertaken in single areas, response rates were variable (67% and 53%, respectively), and the interval between the episode of care and return of the questionnaire was unspecified. These data are therefore of uncertain generalisability to all out of hours care in the UK, and the delay between the episode of care and response may have affected the results.

We have previously presented the results of a randomised controlled trial provided by practice and deputising doctors, but only included differences in satisfaction between the services

Table 1 Association between service, patient, and care factors and satisfaction with out of hours care

	Association with satisfaction		
	Salisbury[15]	*Shipman et al*[16]	*McKinley et al*[14]
Patient factors			
Age	Increases with age	Increases with age	
Sex	Female higher		
Access to car	Not significant		
Ethnicity	Non-white less satisfied		
Felt able to travel		Increased	
Domiciliary care desired	Decreased	Decreased	
Service			
Type	Not significant	Greater satisfaction with delay by practices	Greater satisfaction with care provided by practices than by deputising services
Location of care	Decreased with telephone advice	Increased with centre care	
Time of call			
Delay	Decreases with delay		
Care			
Prescription given		Increased	
Outcome		Increased with improved outcome	

(table 1).[14] These data were from four deputising services (three in a regional metropolitan area and one in a single regional city) and were all gathered within 5 days of the episode of care. They were suitable for multivariate analysis of the association between satisfaction and factors reflecting patients (age, sex, access to a car, and ethnicity), services (deputising or practice, principal *v* non-principal deputy, delay and time of request), care given (prescription issued or not), and symptom resolution, and provide more generalisable results than the previous studies. We now present this analysis.

Methods

The data were collected as part of the previously reported prospective randomised comparison of out of hours care provided by deputising services and by own practice doctors to which we refer readers for full details of the methods of data collection.[14 17] Briefly, patients requesting out of hours care in 14 teaching and training practices which served both inner city and suburban populations in Leicester, Manchester, Salford, and Stockport were approached in their own homes and asked to complete the satisfaction questionnaire[8] and health outcome scale. Data were collected from close relatives or carers of children less than 16 years old and people who were unable to complete the questionnaire because of infirmity or not having a language spoken by an available interviewer. The questionnaire was administered by the interviewer if the patient or participant could not read English. Out of hours duty periods were randomly assigned to practice and deputising doctors of whom there were 49 and 183, respectively (61% of deputising doctors were local principals). A request for out of hours care was defined as any request for medical care between 19.00 and 07.00 hours on weekdays, from 13.00 hours on Saturdays, and from 07.00 for 24 hours on public holidays.

Data on the service and call type (table 2) were obtained from clinical records of the episode of care. All other information was obtained at interview. Patients' expectations of the care they would receive were obtained using the question "When the doctor was called, which of the following was wanted?" to which the responses were "to ask for a visit", "to ask for advice or reassurance on the telephone", "to ask to be seen at the surgery or medical centre", "not sure of the reason", and "other". Change in the patient's perceived health status was measured using responses on a graduated visual analogue scale to the question: "Compared with how you felt when you called the doctor, how do you feel now?" on which 0 corresponded with "much worse", 40 with "no difference", and 100 with "completely better". Patient satisfaction was assessed using a multi-scale satisfaction questionnaire containing 32 questions which comprise an "overall satisfaction" scale and seven subscales (satisfaction with "communication and management" in the consultation, "doctor's attitude", "continuity of care", "delay until visit", "access to out of hours care", "initial contact person" (for example, telephonist), and "telephone advice"). Its reliability and validity have been established.[8]

Table 2 Variables included in the analysis

Patient characteristics	
Age (years)	<1, 1–4, 5–15 16–29, 30–64, over 65
Sex	Male, female
Access to car at time of request	Yes, no
Ethnicity	White, non-white
Service characteristics	
Service	Practice or deputising
Type of doctor seen	Practice, GP principal deputy, non principal deputy
Delay to visit	Minutes
Call type	Daytime, evening, night
Care given	
Prescription received	Yes, no
Outcome of care	
Perceived improvement in health	Visual analogue scale (mm)

METHOD OF ANALYSIS AND DATA PRESENTATION

The relationships between "overall satisfaction" and six of the seven satisfaction subscale scores and patient, service, clinical care, and outcome factors listed in table 2 were statistically modelled for all patients in the original study. The "telephone advice" subscale was not included because it was received by only 11% of patients. Because only 6% of subjects described their ethnic group as other than white, ethnicity has been grouped as "white" and "non-white". Because 95% of patients

Table 3 Overall satisfaction

Variable		*Estimate*	*95% confidence interval*	*p value*
Adjusted mean satisfaction		67.6	62.7 to 72.5	
Patient characteristics				
Age	1–4	1.9	2.5 to 6.2	<0.0001
	5–15	5.1	0.4 to 9.8	
	16–29	4.1	−0.8 to 8.9	
	30–64	8.9	4.4 to 13.3	
	Over 65	12.8	8.1 to 17.6	
Female		−1.6	−4.0 to 0.8	0.2
No access to car		−2.9	−5.2 to −0.5	0.03
Non-white		−3.5	−8.5 to 1.5	0.4
Service characteristics				
Deputising service		−10.6	−14.3 to −6.8	<0.0001
Non-principal deputy		2.1	−2.3 to 6.4	0.3
Delay (minutes)		−0.013	−0.02 to −0.001	0.02
Night visit		−1.6	−4.3 to 1.1	0.3
Care given				
Prescription given		2.3	−0.2 to 4.9	0.1
Outcome of care				
Visual analogue scale (mm)		0.24	0.18 to 0.3	<0.0001
Intracluster correlation (doctors)		0.039		0.0003

The adjusted mean satisfaction has been adjusted for the other variables in the table. Subsequent rows give the change in satisfaction for each variable. For example, overall satisfaction was 1.9 scale points higher for a child aged 1–4 than for an infant less than 1 year old or 1.6 scale points less for a female of the same age. For "delay" and "outcome" the data represent the change in satisfaction for each extra minute of delay or millimetre improvement in outcome measured by the visual analogue scale. The doctor (or practice) effect represents the intracluster correlation in satisfaction in patients seen by the same doctor (or practice/service).

cared for by the deputising services received a visit, the relationship between patients' expectation of receiving telephone advice or a visit and whether they actually received advice or a visit was examined using data from subjects receiving care from practice doctors; 20.8% of patients who received care from practices received telephone advice while 1.4% of those who received care from deputising services did; 74.9% and 94.8%, respectively, received home visits from each service and 3.9% and 2.5%, respectively, received care at centres from each service.[17]

Data were analysed using a multilevel model[18 19] because satisfaction scores for subjects cared for by the same doctor or practice were correlated (see appendix).[14] An analysis which ignores this correlation will produce confidence limits which are too narrow. The "adjusted mean satisfaction" line shows the mean and 95% confidence limits of the satisfaction scores for a white male patient less than 1 year old with family access to a car at the time of the request which was made during the day or evening (not between 22.00 and 07.00 hours). He received care from a practice doctor who arrived 52 minutes after the request (the average for the sample) and did not give a prescription. The patient had the average health outcome scale score of 69. For satisfaction with aspects of care likely to be determined by practice organisation ("access" and "initial contact person"), the level of analysis was the practice or service rather than the doctor. The "estimate" column then shows the change in satisfaction scores for each factor. For dichotomous factors the estimate is added to the baseline estimate. The estimates for delay and outcome show the change in satisfaction with change in delay or outcome measured in minutes or millimetres on the visual analogue scale, respectively.

Results

Of the 2152 patients recruited to the study, 2063 were eligible for inclusion and 1466 (71%) were interviewed. Of these, 1402 (86%) completed at least part of the satisfaction questionnaire. There was no difference in the sex ratio of respondents and non-respondents (57.8% and 58.2% female, respectively; χ^2=0.806, p=0.8) although the mean age of the respondents was lower than that of the non-respondents (26.7 years *v* 33.2 years; *t*=4.6, p<0.001). A parent acted as informant for 97.3% of those aged less than 16 years. An informant responded for 14% of the adults and the interviewer administered the questionnaire to 10% of adults. Of the last two groups, 64% and 65%, respectively, were aged over 65 years and 8% and 3%, respectively, described their ethnic origin as non-white.

The data for "overall satisfaction" are shown in table 3. Older patients and the carers of older children expressed greater "overall satisfaction". Other important influences were the doctor type, perception of the patient's health outcome and, to a lesser extent, access to a car and the delay to visit. Patients who were seen by deputising doctors had overall satisfaction scores 10.6 (95% CI 6.8 to 14.3) scale points lower than those seen by practice doctors. The scores were 2.9 (95% CI 0.5 to 5.2) points less for patients without access to a car and approximately 0.24 (95% CI 0.18 to 0.30) scores more for each millimetre increase in the visual analogue outcome scale.

The regressions for each satisfaction subscale are shown in table 4. Older adults and the carers of older children expressed greater satisfaction on all subscales except "continuity of care". Women and the carers of female children were less satisfied with "continuity of care" and "delay". Non-white subjects were less satisfied with "communication and management", the "doctor's attitude", and the "initial contact person". Patients who had access to a car at the time of their request were more satisfied with the "doctor's attitude".

Patients who had received care from a deputising doctor were less satisfied on all except the "continuity of care" and "access" subscales. Increased delay between the request and the visit was associated with decreased satisfaction with "access" and "delay". Nevertheless, it was a small effect with an increase in delay of 90 minutes reducing the mean satisfaction by 3.8 scale points. Those who had requested care at night (between 22.00 and 07.00 hours) were more satisfied with "access to care". Whether or not a deputy was a general practice principal had no effect on any of the subscales.

Giving a prescription was associated with increased satisfaction with "communication and management". Improved perceived health outcome was associated with increased satisfaction on all subscales.

PATIENT EXPECTATION

If telephone advice was given when a visit was expected, "overall satisfaction" scores were 18.3 (95% CI 11.0 to 25.6) scale points lower than if telephone advice was both requested

Table 4 Patient satisfaction on each satisfaction subscale

Variable		*Estimate*	*95% confidence interval*	*p value*
Communication and management				
Adjusted mean satisfaction		66.1	61.4 to 70.8	
Patient characteristics				
Age	1–4	1.0	−3.1 to 5.1	
	5–15	4.0	−0.4 to 8.5	
	16–29	−0.9	−5.4 to 3.6	<0.0001
	30–64	5.9	1.7 to 10.1	
	Over 65	8.2	3.7 to 12.7	
Female		0.2	−2.1 to 2.5	0.9
No access to car		−1.4	−3.7 to 0.8	0.3
Non-white		−6.2	−11.0 to −1.5	0.05
Service characteristics				
Deputising service		−7.7	−11.4 to −4.0	<0.0001
Non-principal deputy		2.0	−2.3 to 6.2	0.4
Delay (minutes)		−0.004	−0.016 to 0.007	0.4
Night visit		−2.5	−5.0 to 0.0	0.05
Care given				
Prescription given		3.2	0.8 to 5.6	0.02
Outcome of care				
Visual analogue scale (mm)		0.32	0.26 to 0.38	<0.0001
Intracluster correlation (doctor)		0.054		<0.0001
Doctor's attitude				
Adjusted mean satisfaction		71.1	65.8 to 76.3	
Patient characteristics				
Age	1–4	1.1	−3.4 to 5.6	
	5–15	6.3	1.4 to 11.3	
	16–29	1.8	−3.3 to 6.8	<0.0001
	30–64	6.8	2.2 to 11.4	
	Over 65	10.9	5.9 to 15.8	
Female		0.3	−2.3 to 2.8	0.8
No access to car		−3.1	−5.5 to −0.6	0.05
Non-white		−7.2	−12.5 to −1.9	0.03
Service characteristics				
Deputising service		−6.7	−11.0 to −2.4	0.008
Non-principal deputy		1.9	−2.9 to 6.8	0.4
Delay (minutes)		−0.0006	−0.019 to 0.007	0.3
Night visit		−1.9	−4.8 to 0.9	0.2
Care given				
Prescription given		1.9	−0.7 to 4.6	0.2
Outcome of care				
Visual analogue scale (mm)		0.21	0.15 to 0.27	<0.0001
Intracluster correlation (doctor)		0.068		<0.0001
Continuity of care				
Adjusted mean satisfaction		61.6	57.2 to 66.0	
Patient characteristics				
Age	1–4	−1.8	−5.8 to 2.2	
	5–15	0.3	−4.0 to 4.7	
	16–29	0.9	−3.5 to 5.4	0.2
	30–64	−1.4	−5.5 to 2.7	
	Over 65	−3.0	−7.4 to 1.4	
Female		−3.9	−6.1 to −1.6	0.001
No access to car		0.3	−1.9 to 2.4	1.0
Non-white		−3.6	−8.3 to 1.0	0.3
Service characteristics				
Deputising service		1.8	−1.5 to 5.1	0.2
Non-principal deputy		−0.7	−4.5 to 3.1	0.7
Delay (minutes)		−0.003	−0.013 to 0.007	0.7
Night visit		0.3	2.2 to 2.8	0.8
Care given				
Prescription given		−0.7	−3.1 to 1.6	0.6
Outcome				
Visual analogue scale (mm)		0.08	0.02 to 0.13	0.006
Intracluster correlation (doctor)		0.023		0.07
Delay until visit				
Adjusted mean satisfaction		51.8	57.2 to 66.0	
Patient characteristics				
Age	1–4	−2.0	−6.9 to 3.0	
	5–15	2.5	−2.9 to 8.0	
	16–29	−4.7	−10.2 to 0.8	0.001
	30–64	1.7	−3.4 to 6.8	
	Over 65	6.6	1.3 to 12.0	
Female		3.3	0.6 to 6.0	0.01
No access to car		−1.3	−3.9 to 1.4	0.4
Non-white		−6.8	−12.7 to −0.9	0.07
Service characteristics				
Deputising service		−12.5	−16.8 to −8.2	<0.0001
Non-principal deputy		1.1	−3.7 to 5.9	0.6
Delay (minutes)		−0.046	−0.059 to −0.033	<0.0001
Night visit		−0.5	−3.5 to 2.6	1.0
Care given				
Prescription given		1.2	−1.5 to 3.9	0.5
Outcome of care				
Visual analogue scale (mm)		0.11	0.04 to 0.18	0.001
Intracluster correlation (doctor)		0.061		<0.0001

and given. Satisfaction was also reduced with "communication and management" by 24.7 (95% CI 17.7 to 31.7) scale points after adjusting for age and clustering, the "doctor's attitude" by 22.7 (95% CI 14.9 to 30.4) scale points after adjustment, and with the "initial contact person" by 12.1 (95% CI 4.5 to 19.7) scale points after adjustment.

MODEL CHECKING

Distribution of the scale scores was checked using normal probability plots of the residuals at patient and doctor levels. These were irregular, with evidence of a ceiling and floor effect because the scales were derived by the summing of ordered categorical items. The precision of the estimates of the model parameters was checked using a non-parametric bootstrap[20] which gave estimates consistent with the parametric analysis, thus confirming the robustness of the models used.

Discussion

These data contain important messages for both purchasers and providers of out of hours primary medical care. They indicate that patient satisfaction is related to characteristics of the patient and service, care given, outcome, and also to expectations of patients.

PATIENT CHARACTERISTICS

Older patients and respondents for older children were more satisfied with the care received. This effect is more complex than that reported by Salisbury[15] and may represent a cohort effect as the carers of older children will tend to be older parents. It reflects the findings of previous work which indicate that satisfaction increases with age[21]; however, Baker and Streatfield found that satisfaction with general practice declined with increasing age, but this was related to a greater desire for personal care.[22] This desire seems to have been less important to patients who had requested urgent care.

Rashid and Jagger[23] found that Asian subjects have a greater expectation that medical care will be available 24 hours a day. Salisbury[15] found that non-white subjects expressed lower overall satisfaction, but our results did not confirm this finding. We found that non-white people expressed lower average satisfaction with "communication and management", the "doctor's attitude", and the "initial contact person". Although people of Asian origin place more importance on receiving out of hours care from a doctor from their own practice,[23] there was no association between satisfaction with "continuity of care" and ethnicity in these data.

Patients who did not have access to a car at the time of the request were likely to be from socioeconomic groups 4 and 5. Their lower "overall satisfaction" and satisfaction with the "doctor's attitude" may reflect the relationship between satisfaction with care and socioeconomic status previously reported.[21]

Table 4 continued

Variable		*Estimate*	*95% confidence interval*	*p value*
Access to out of hours care				
Adjusted mean satisfaction		69.3	64.5 to 74.1	
Patient characteristics				
Age	1–4	1.7	−2.3 to 5.7	0.02
	5–15	5.0	0.6 to 9.3	
	16–29	0.8	−3.7 to 5.3	
	30–64	4.8	0.7 to 9.0	
	Over 65	5.2	0.7 to 9.8	
Female		0.5	−1.8 to 2.8	0.6
No access to car		−2.4	−4.6 to 0.2	0.1
Non-white		−5.8	−10.5 to −1.1	0.08
Service characteristics				
Deputising service		−2.4	−6.1 to 1.3	0.2
Non-principal deputy		−1.3	−5.0 to 2.4	0.5
Delay (minutes)		−0.014	−0.027 to −0.002	0.02
Night visit		2.6	0.0 to 5.1	0.03
Care given				
Prescription given		−0.9	−3.3 to 1.5	0.5
Outcome of care				
Visual analogue scale (mm)		0.07	0.01 to 0.12	0.02
Intracluster correlation (practice/service)		0.032		<0.0001
Initial contact person				
Adjusted mean satisfaction		67.9	63.1 to 72.6	
Patient characteristics				
Age	1–4	3.7	−0.8 to 8.1	0.01
	5–15	5.7	0.9 to 10.4	
	16–29	4.5	−0.5 to 9.6	
	30–64	6.7	2.1 to 11.3	
	Over 65	7.8	2.8 to 12.9	
Female		0.3	−2.2 to 2.9	0.7
No access to car		−1.1	−3.5 to 1.4	0.7
Non-white		−6.9	−11.9 to −1.9	0.01
Service characteristics				
Deputising service		−4.7	−8.0 to −1.4	0.02
Non-principal deputy		1.7	−2.2 to 5.6	0.4
Delay (minutes)		0.012	−0.026 to 0.002	0.09
Night visit		−0.9	−3.7 to 1.9	0.6
Care given				
Prescription given		0.0	−2.7 to 2.7	0.9
Outcome of care				
Visual analogue scale (mm)		0.01	−0.06 to 0.07	0.04
Intracluster correlation (practice/service)		0.001		0.9

See footnote to table 3.

SERVICE CHARACTERISTICS

Characteristics of the service were related to satisfaction in two ways. Firstly, patients were less satisfied with deputising doctors on all scales except for "continuity of care" and "access to out of hours care". All but one practice used the deputising service telephone answering services so that the arrangements for accessing out of hours care were similar in each group. We found no difference in expressed satisfaction on the "continuity of care" subscale; we believe this reflects a desire for readily available out of hours care which contrasts with the desire for routine care from a personal doctor.[22 24 25] Secondly, increased delay between the request and visit was associated with decreased "overall satisfaction" and satisfaction with "delay until visit" and "access to out of hours care", although the effects were small. Satisfaction with the "communication and management" and the "doctor's attitude" was not affected by increased delay. A request for out of hours care represents a perceived need for urgent medical attention. This may help to explain the above finding. If the perceived urgent need is not met, satisfaction with the content of care ("communication and management" and "doctor's attitude") is unaffected but satisfaction with the speed of response ("delay" and "access") and "overall satisfaction" (which uses items such as "the out of hours service could be improved") is reduced.

PROCESS AND OUTCOME OF CARE

Issuing a prescription was only associated with increased satisfaction with "communication and management" and "access". This may reflect an insufficient explanation of why a prescription was not necessary by the doctor. It is also important to note that giving a prescription is not associated with most aspects of satisfaction, which is in contrast with the finding of Shipman.[16]

The relationship between satisfaction and health outcomes is likely to be complex. Higher patient satisfaction with medical care improves compliance[7 26] which may improve health outcomes. Nevertheless, patients may report greater satisfaction on post hoc satisfaction measures if they perceive the outcome of their care to have been an improvement in their health. It may not be possible to determine whether outcome is causally related to satisfaction using observational data.

EXPECTATION

Our only formal indication of patient expectation was whether the patient expected telephone advice or a home visit. Patients were more satisfied if this expectation was met. The relationship between satisfaction and delay until visit also suggests that expectation is as important a determinant of satisfaction with out of hours care as it is for care during normal consulting hours.[27] It is likely that there will continue to be a mismatch between patients' expectations, their medically defined need, and the resources of the health service which is providing care.[28] Patients' desire to have out of hours care at home from a doctor they know is likely to be eroded by the continuing establishment of general practitioner out of hours cooperatives with which patients are no more satisfied than deputising services.[15] Whether or not the likely decrease in patient satisfaction with out of hours primary medical care can be reduced or reversed by modifying patient expectation is uncertain, but is an area worthy of future research.

STUDY DESIGN

This is an additional analysis of data collected for a previous study which provided an observational comparison of doctor, patient, and service factors which may influence patient satisfaction with care. The findings therefore have to be interpreted with caution, but they indicate important areas for further enquiry. Nevertheless, the study has multiple strengths. Patients from 14 practices were randomly allocated to two systems of care. A high response rate to a valid reliable patient satisfaction questionnaire was achieved within 5 days of the request for care, which should have minimised change in satisfaction with time. The data were gathered by trained standardised interviewers. A wide range of suburban and inner city patients in four urban areas in the UK were recruited which should be representative of urban patients although all practices were teaching and training practices. Nevertheless, older subjects were underrepresented among responders so the data may

be less generalisable to this group, although it is in agreement with many other data. An informant provided information for all children and for 14% of adults, so these patients' view of their care was not obtained. Nevertheless, informants are likely to act as the patients' advocate and we believe they provided valuable information in this context.

CONCLUSION

These data indicate that patient satisfaction with out of hours care varies with patients, services and the care given, and its outcome. Their implications are manifold—for example, the finding that non-white subjects are less satisfied with interpersonal aspects of the care given requires investigation, continuity does not seem to be an issue for patients in this context of care but patients need to be kept informed about likely delays, and perhaps reasons for them, and the finding that receipt of a prescription does not affect satisfaction should help to reduce professional anxieties about the perceived negative impact of non-prescribing for patients who request out of hours care. The data also demonstrate the importance of patient expectation and that it is unlikely that patient satisfaction with out of hours care can be addressed by providers alone. Both purchasers and providers need to investigate urgently whether expectation can be managed.

Appendix

Multilevel modelling is a statistical technique used to overcome the problems encountered when data are clustered. Clustering may occur when there are groups of subjects who are more like each other than the rest of the study population. For example, in a multipractice study patients from one practice may resemble each other more in some respects than would be expected by chance.

If summary statistics for each cluster (practice) are compared, data are "lost" and calculated competence limits will be wide. Also, unless some adjustment is made in the analysis for the size of each cluster, small clusters will exert a disproportionate effect on the result. An analysis based purely on individual subjects will produce confidence limits which are too narrow because variation within each cluster may be less than expected. Multilevel analysis accounts for similarities between subjects in each cluster (intracluster correlations) and produces more reliable estimates of the confidence limits for a random population. The analysis will produce an estimate of the intracluster correlation coefficients. For these data the intracluster correlations for the satisfaction scales vary between 0.02 and 0.07.[14]

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