Sex inequalities in access to care for patients with diabetes in primary care:
questionnaire survey

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ABSTRACT

Background
Health experiences differ between men and women. The health services have focused their attention on gynaecological health problems in women, however women with non-gynaecological health problems could be unintentionally neglected. Given the increased prevalence of diabetes, the healthcare needs and experiences of women with diabetes are increasing.

Aim
To determine the extent of sex inequalities in access to care for diabetes in primary care.

Design of study
Cross-sectional population-based questionnaire study.

Setting
Twenty-three general practices spread through 23 different primary care trusts in the former Trent Region, UK.

Method
The study consisted of a random sample of 1673 patients with diabetes. Outcomes measured were odds ratios adjusted for age for measures of physical access to the GP's surgery; ease of obtaining appointments; access to primary care professionals; levels of routine diabetes care received; barriers to physical activity, problems eating and psychological distress as measured by the 18 score Diabetes Health Profile.

Results
Women were less likely than men to report that they had talked to their GP or practice nurse about their diabetes in the previous 12 months and were less likely to report that they were able to book routine appointments at convenient times. Almost 40% of all patients with diabetes reported difficulty in visiting the GP's surgery for their diabetes care, and women were more likely to report difficulties in visiting the surgery than men. Women were more likely than men to be afraid to go out alone (7.9% versus 3.6%) and more likely to be housebound (6.8% versus 2.4%). Women had significantly higher scores for eating problems and barriers to physical activity than men.

Conclusions
Women report more problems with access to diabetes care than men. If the ambitions of the National Service Framework are to be met, then positive action needs to be taken to improve access to care for women with diabetes.

Keywords
diabetes mellitus; health care quality, access, and evaluation; inqualities; sex.

INTRODUCTION

The health experiences of women are different from those of men and it is highly appropriate that the Acheson report *Inequalities in Health* calls for more research into inequalities in health by sex.[1] Women and men have differing patterns of morbidity and mortality, with elderly women suffering greater morbidity than elderly men.[2] It is essential that the NHS is sensitive to how sex affects health and access to health services. Hitherto the health service has focused its attention on biological differences with services focusing on women's reproductive needs, contraceptive health and the prevention of gynaecological cancers.[1]

While this is laudable, an unintended consequence could be the neglect of women with non-gynaecological health problems. For example, other diseases such as coronary artery disease, are traditionally seen as 'male' diseases. Such perceptions are likely to underlie the stark sex inequalities in the provision of secondary prevention for coronary heart disease which have been demonstrated.[3–8]

Conditions such as diabetes affect both men and women. Given the increased prevalence of diabetes in the elderly, its high rate of preventable complications in the elderly and the changing age

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and sex structure of the population, the morbidity and healthcare needs experienced by women with diabetes are likely to be substantial and growing.

There is no reason why the delivery of high-quality care for diabetes should be affected by sex. Indeed, the National Service Framework (NSF) for diabetes aims to improve the quality of care for all patients with diabetes and reduce inequalities.[9] Despite the evidence for sex inequalities in the care of women with coronary artery disease,[3–8] little is known about the existence of sex inequalities in access and quality of care for men and women with diabetes. While patients with diabetes are known to have excess mortality especially from cardiovascular disease,[10] we do not understand why this excess risk is more marked in women than men.[11] It could reflect differences in prevalence of risk factors and/or it could reflect differing patterns of access and uptake of care.

It is important to document baseline data if the NSF for diabetes is to deliver its ambitions and improve the health of all patients with diabetes. The NSF intends to place a great emphasis on patient-centred care and the views of its patients are of utmost importance. The NSF recognises that good care is team based — team care recognises that different aspects of care call for different people with a range of skills. Also, good services have good access for routine, urgent and emergency care — access that is equitable, not discriminating on the grounds of age, sex, ethnicity or beliefs.

We undertook a large population-based survey designed to determine the extent of sex inequalities in primary care access to care for men and women with diabetes. Access to care is of fundamental importance in the NHS, since the service was founded on the principle of equity of access for equal need. Furthermore, as society changes — and the NHS with it — the public increasingly expects to receive not just fairness in access to care but prompt, convenient and effective services.

METHOD
Design and setting
This was a cross-sectional questionnaire survey undertaken in general practices in the former Trent Region. Practices were recruited via the Trent Focus Collaborative Research Network, members of which have been found to be representative of practices elsewhere in Trent.[12] We approached 45 practices; 33 (73.3%) agreed to participate, and 25 were selected, each within a different primary care trust area within the former Trent Region (UK). Two practices later withdrew, one due to other commitments and one because it was participating in another diabetes study.

How this fits in
Effective and early control of blood glucose and blood pressure reduce complications in patients with diabetes. Inequalities in access to care for patients from less affluent backgrounds are known to exist and are likely to affect outcomes for patients with diabetes. Sex differences in access to care have been found for other diseases not traditionally viewed as 'female' problems. Unexpected sex differences in mortality and morbidity in diabetes have been observed, but the underlying reasons have not been satisfactorily explored. This study showed that women with diabetes were less likely to talk to their GP or practice nurse about their diabetes than men, and reported less access to convenient routine appointments; women with diabetes also reported having significantly more problems with physical access compared with men and had significantly higher scores for eating problems and barriers to physical activity than men.

Participants
A researcher visited each practice between January and March 2002 (just prior to the publication of the standards for the NSF for diabetes). We asked each practice to identify a random sample of one-third of the patients on their computerised diabetes register, and to send these patients an invitation signed by a GP, a copy of the questionnaire, a patient information sheet and consent letter, and a reply-paid envelope addressed to the researcher. Each questionnaire was identified by a practice code and the patient's practice computer number. Four weeks after the first mailing, practices were sent a list of those numbers that had been returned, and asked to send a standard reminder letter and questionnaire to all non-responders. A further 4 weeks was allowed for replies. Responders did not have to identify themselves with their name.

We asked practices not to exclude any patient from the mailing unless the questionnaire was likely to cause distress, for example, because of recent bereavement. If any recipients were unable to complete the questionnaire due to age or illness, we asked parents, spouses or carers to complete it and record this on the questionnaire.

Questionnaire design
We designed the questionnaire to measure absolute access to health care and compare relative access to health care within subgroups. Access is a complicated concept[13] and there has been much work in the last 30 years to define its meaning for researchers and health policy makers. For this study, we decided that the following domains were likely to be important for patients with diabetes: temporal factors (for example, time waiting); geographical factors (for example, physical access); socioeconomic factors (for example, social circumstances); educational factors (for example, ability to understand how to enter the health

system) and technological (for example, use of telephone to access services). The text of the questions is shown in the results tables and a copy of the questionnaire is available on request.

We used the 18 score Diabetes Health Profile (DHP), which is a disease-specific questionnaire developed and evaluated in the UK.[14] This is a modified version of the 32-item questionnaire for insulin-dependent diabetic patients, developed and validated by Meadows *et al* and adapted by them for use in non-insulin-dependent patients.[14] The DHP includes measures of constructs of knowledge and cognitive functioning, attitudes and beliefs, management and self-care and treatment satisfaction. It gives three composite scores for barriers to activity, eating problems and psychological distress. It has good content validity from the perspective of the patient. It has good evidence for internal consistency and it is also relatively brief, making it suitable for use alongside a more generic questionnaire. It has also been used in the general practice setting and for measuring differences between patient groups.[15]

We also included the questions from the 2001 Census for unemployment status in the last week, ethnicity, accommodation and access to a car or van, as socioeconomic factors are related to access to diabetes care,[16] and also to morbidity and mortality rates.[17,18]

We piloted the questionnaire twice before the study began in two practices that were not participating in the main study.

Sample size calculation

With 25 practices, and one-third of the patients with diabetes in each practice (estimated at 60 patients per practice) and a 60% response rate to the questionnaire, we estimated that we would need to administer at least 1500 questionnaires in order to obtain at least 900 responses from patients with diabetes. This sample size was determined in order that we would be able to estimate a binary response with an estimated value of 50% to within ±5.8% assuming an intracluster correlation coefficient of 0.05. With this sample size we would have approximately 90% power with a 1% significance level to detect an odds ratio of 1.25 or more comparing females with males, for a binary response with an estimated value of 50% in males, assuming equal numbers of males and females.

Data entry and analysis

We entered questionnaire responses into an Access database, with a 10% repeat entry to check data validity. The error rate was <1.0%. Stata (version 8.0) was used for the analysis.

Unconditional logistic regression was used to calculate odds ratio (OR) with 95% confidence intervals (CI) for each outcome, adjusting for age in 10-year age bands and allowing for clustering within practices using a robust standard error. The logistic regression command for survey data was used with practices identified as the primary sampling unit. The main explanatory variable was sex (females compared with males). We undertook a second analysis which also included three sociodemographic variables (patient living alone, patient has access to a car or van, and patient unemployed) in the model. Mann–Whitney U tests and linear regression for survey data were used to test differences in the three domains of the DHP. A significance level of 0.01 was selected, and the significance tests were two-tailed.

In order to determine whether our responders were likely to be representative of the population of patients with diabetes, we compared the age–sex structure of responders to the questionnaire with the age–sex structure of patients with diabetes derived from a large aggregated general practice database of 468 practices from across the UK in 2001, known as QRESEARCH (www.qresearch.org).

RESULTS

We had 1082 responses from a total of 1673 diabetic patients registered with 23 general practices who received a questionnaire, giving an overall response rate of 64.7%. Altogether, 1026 (94.6%) questionnaires were completed by the patient, 42 (3.9%) were completed by the patient's spouse or carer and 17 (1.6%) were completed by the patient's parent or guardian. We found a very similar age distribution for the male responders in our sample compared with the male population with diabetes in the QRESEARCH database, however there were slightly fewer very elderly patients among the female responders; 49% of the responders to the survey were female, compared with 46% of patients with diabetes in the QRESEARCH population.

Characteristics of male and female responders

Table 1 shows the characteristics of male and female responders. There were no significant differences between males and females in terms of their current age, duration of diabetes, treatment group, ethnicity or employment status. Fewer women had use of a car or a van than men (57.1 versus 77.1%; difference = -20.0%; 95% CI = -27.6 to -12.3%; *P*<0.001), and more women lived alone compared with men (33.5 versus 15.3%; difference = 18.2%; 95% CI = 14.1 to 22.3%; *P*<0.001).

Access to health professionals

Table 2 shows reported access to healthcare professionals in the previous 12 months. Overall, 76.5% of patients reported having talked to their GP about their diabetes, 75.0% to their practice nurse, 57.1% to an optician, 42.4% to a chiropodist and 26.5% to a dietician. Eighty-six per cent of patients found it easy to get through to their surgery by telephone, and 80.8% of patients were able to book routine appointments at a convenient time. Two-thirds of patients thought their surgery would fit them in for an urgent appointment on the same day.

However, compared to men, women were less likely to report that they had talked to their GP (age- and practice-adjusted OR = 0.67; 95% CI = 0.53 to 0.84) or practice nurse (age- and practice-adjusted OR = 0.67; 95% CI = 0.50 to 0.89) about their diabetes in the previous 12 months. Women were less likely to report that they were able to book a routine appointment at a time convenient for them (age- and practice-adjusted OR = 0.47; 95% CI = 0.30 to 0.74). These findings remained significant when adjusted for three sociodemographic variables (living alone, unemployment, access to a car or van) and similar ORs and 95% CIs were produced.

Women were slightly more likely to report always or sometimes having problems understanding what the doctor or nurse said to them (age- and practice-adjusted OR = 1.42; 95% CI = 1.04 to 1.93), but this was not statistically significant at $P<0.01$.

Table 1. Characteristics of male and female responders.

	Female		Male		Total	
	$n = 532$	Col %	$n = 550$	Col %	$n = 1082$	P-value[a]
Median (IQR) duration diabetes in years	6 (3–12)		6 (2–12)		6	0.49
Age band (years)						
<55	127	23.9	133	24.2	260	0.77
55–64	114	21.4	127	23.1	241	
65–74	151	28.4	162	29.5	313	
75–84	115	21.6	104	18.9	219	
≥85	25	4.7	24	4.4	49	
Treatment group						
Diet only	111	21.2	123	22.8	234	0.10
Oral medication and diet	252	48.1	273	50.6	525	
Insulin and diet	120	22.9	120	22.2	240	
Insulin, oral medication and diet	41	7.8	24	4.4	65	
Census-related questions						
Patient's ethnic group is white	511	96.1	534	97.1	1045	0.34
Patient has use of car or van	304	57.1	424	77.1	728	<0.001
Patient lives alone	178	33.5	84	15.3	262	<0.001
Patient is unemployed	15	2.8	20	3.6	35	0.37

Col % = column percentage. [a]χ^2 test for categorical variables and Mann–Whitney U for duration of diabetes, adjusted for clustering by practice.

Getting to the GP's surgery

Overall, 39% of patients reported difficulty in visiting the doctor for diabetes care. The most common reason was the long walk to the surgery, cited by 21.0% of patients (227 of 1082). Difficulties in getting time off work, being afraid to go out alone, feeling too ill and lack of buses were cited by 5–6% of all patients.

Table 2. Access to primary care health professionals.

	Female		Male				
Question	$n = 532$	Col %	$n = 550$)	Col %	AOR[a]	95% CI	P-value
Have you talked to any of these people about your diabetes in the last 12 months?							
A family doctor at the surgery?	387	72.7	441	80.2	0.67	0.53 to 0.84	0.002
A practice nurse at your surgery?	379	71.2	432	78.5	0.67	0.50 to 0.89	0.01
An optician?	292	54.9	326	59.3	0.84	0.62 to 1.14	0.25
A chiropodist ?	229	43.0	230	41.8	1.05	0.78 to 1.41	0.74
A dietician?	143	26.9	144	26.2	1.05	0.90 to 1.22	0.54
Are you able to book routine appointments at a time convenient for you?	414	77.8	460	83.6	0.47	0.30 to 0.74	0.002
If you need to telephone your surgery is it usually easy to get through?	448	84.2	482	87.6	0.72	0.51 to 1.01	0.06
If you needed an urgent appointment for diabetes care do you think the surgery would fit you in on the same day?	327	61.5	365	66.4	0.83	0.60 to 1.14	0.23
Do you always or sometimes have problems understanding what the doctor or nurse has said to you?	229	43.0	193	35.1	1.42	1.04 to 1.93	0.03

AOR = adjusted odds ratio. Col % = column percentage. [a]The odds ratios compare women with men, are adjusted for age, and take account of clustering by practice. Values given are for those answering 'yes' to the question.

Table 3. Reasons for difficulties visiting doctor for diabetes care.

Question	Female n = 532	Col %	Male n = 550	Col %	AOR[a]	95% CI	*P*-value
Do you have any difficulties with visiting the doctor?	235	44.2	187	34.0	1.52	1.19 to 1.94	0.002
Are you afraid to go out on your own?	42	7.9	20	3.6	2.24	1.26 to 3.99	0.01
Is it too costly to travel to the surgery?	16	3.0	11	2.0	1.47	0.80 to 2.70	0.21
Do you feel too ill?	31	5.8	24	4.4	1.34	0.81 to 2.23	0.24
Are you housebound?	36	6.8	13	2.4	3.09	1.51 to 6.34	0.004
Is it a long walk to the surgery?	132	24.8	95	17.3	1.57	1.08 to 2.28	0.02
Are there not enough buses?	37	7.0	25	4.5	1.55	0.90 to 2.66	0.11
Do you have difficulty getting time off work?	23	4.3	37	6.7	0.61	0.37 to 1.01	0.06

AOR = adjusted odds ratio. Col % = column percentage. [a]The odds ratios compare women with men, are adjusted for age, and take account of clustering by practice. Values given are for those answering 'yes' to the question.

As Table 3 shows, women were more likely to report difficulties in physically getting to the GP's surgery (age- and practice-adjusted OR = 1.52; 95% CI = 1.19 to 1.94). Women were more likely to be afraid to go out alone (age- and practice-adjusted OR = 2.24. 95% CI = 1.26 to 3.99) and to report being housebound (age- and practice-adjusted OR = 3.09, 95% CI = 1.51 to 6.43). These findings remained significant when adjusted for the three sociodemographic variables (living alone, unemployment, access to a car or van).

Access to routine care

In terms of routine check ups in the previous 12 months, 71.7% of all patients recalled receiving dietary advice, 51.0% recalled receiving advice about exercise, 78.4% reported that they had an eye examination, 80.9% had their feet examined, and 95.0% reported a blood pressure measurement (Table 4).

There were no significant differences for these factors between men and women, although women were slightly less likely than men to report that they had had their feet examined (age-adjusted OR = 0.66; 95% CI = 0.44 to 0.99), but this was not statistically significant at *P*<0.01.

Diabetes health profile

The number of valid scores (that is, every question in a domain answered) was at least 89% for each domain. Assessment of Cronbach's α for the entire patient group gave satisfactory values of 0.84 for psychological distress, 0.76 for barriers to activity, and 0.81 for disinhibited eating. These compare favourably with the scores given in the validation of the DHP-18.

In terms of our main study comparison, we found that women had significantly higher scores on the DHP for eating problems (women: median = 6, interquartile range [IQR] = 3–8; men: median = 5, IQR = 3–7; *P* = 0.003) and barriers to physical activity (women: median 4, IQR = 2–7; men: median = 4, IQR = 1–6; *P* = 0.001), but no difference for psychological distress (women: median = 3, IQR =

Table 4. Access to diabetes checkups in the last 12 months.

Question: In the last 12 months ...	Female n = 532	Col %	Male n = 550	Col %	AOR[a]	95% CI	*P*-value
Did someone talk to you about what you should eat because of your diabetes?	379	71.2	397	72.2	1.00	0.70 to 1.44	0.99
Did someone talk to you about exercise or what you could do to keep fit?	251	47.2	301	54.7	0.76	0.56 to 1.04	0.09
Did someone put drops in your eyes in order to examine them?	407	76.5	441	80.2	0.86	0.64 to 1.14	0.28
Did someone examine your feet?	415	78.0	460	83.6	0.66	0.44 to 0.99	0.04
Did someone measure your blood pressure?	502	94.4	526	95.6	0.61	0.30 to 1.23	0.16

AOR = adjusted odds ratio. [a]The odds ratios compare women with men, are adjusted for age, and take account of clustering by practice. Values given are for those answering 'yes' to the question.

1–5; men: median = 3, IQR =1,6; *P* = 0.60). These differences remained significant in linear regression analysis adjusting for age-band and three sociodemographic variables (living alone, unemployment, access to a car or van), with allowance for clustering by practice.

DISCUSSION

Summary of main findings

This is a large population-based survey of patients with diabetes conducted in UK primary care at the time of the first publication of the NSF for diabetes. In terms of absolute access to care, the vast majority (>80%) of patients with diabetes had been in contact with their general practices within the last 12 months, but 40% reported difficulties in visiting the practice. While absolute access is shown to be reasonable, we found inequalities between men and women in terms of their relative access to care, with women having more difficulties in accessing diabetes care than men. They reported finding it more difficult to book a routine appointment at a convenient time, and to get to the surgery, and they were less likely to talk to the doctor or a practice nurse. All these findings were independent of age, sociodemographic factors (living alone, unemployment and access to a car or van), and took account of clustering by the patients' registered practice.

Strengths and limitations of the study

Methodological strengths of our study include its large population base, random sampling of all patients with diabetes within practices, a reasonable response rate, and the use of validated instruments where available. We found very little evidence of a selection bias since the age and sex of the responders compared well with population data. This means that our sample is representative of the general population with diabetes and hence the findings are likely to be generalisable.

Overall it appears that the DHP-18 within our questionnaire has given reliable results in comparison with other studies, and shown some ability to distinguish between differing groups of patients. Our patient sample differed from the populations previously studied using the DHP, in that it was entirely community based and included all treatment modalities (diet alone, diet and tablets, insulin alone and diet, tablets and insulin) and had no limits on age. Some of our patients were children, and it may have been difficult for their parents to answer the questions on their behalf; some were frail elderly and housebound, so questions were inapplicable. The absolute proportions of such patients were low, and our

odds ratios were age adjusted, so this is unlikely to have impacted on our results. The cross-sectional nature of our study enables us to comment on association rather than causation.

Comparison with existing literature

Our finding that over 80% of patients with diabetes had been in contact with their general practices within the last 12 months while it should be close to 100%, still represents a vast improvement on the 20% of patients with diabetes reported to have seen their general practice at least once in 5 years between 1990 and 1995.[16] It probably reflects the shift in care from secondary to primary care over the last decade.

The differential reporting of access to diabetes care by men and women suggests that there may be sex inequalities in diabetes, as has been been found in the care of women with coronary artery disease.[3–8] It is however possible that different levels of recall could explain our findings (that is, women were less able to remember talking to a doctor or nurse than men), but if this were the case then we would expect to find sex differences for the other questions relying on recall such as talking to a chiropodist or dietician and receiving dietary advice. The findings may also represent different expectations of males and females in terms of access, since the data are self-reported. There is however evidence from clinical records that women with diabetes are significantly less likely than men to have records for body mass index, pulses, blood pressure values below 145/85 mmHg, microalbuminuria testing, serum cholesterol concentration, serum cholesterol values below 5 mmol/l or treatment with angiotensin-converting enzyme inhibitors in the presence of proteinuria or microalbuminuria.[19]

Implications for clinical practice and future research

Regular monitoring and medication review are crucial for the management of patients with diabetes, because early and effective glycaemic control and blood pressure control decrease complication rates and improve survival.[20,21] Problems with all types of access to care will clearly severely limit the opportunities that patients have to benefit from these measures, and better understanding of the issues can help lead to measures to improve access. For example, simple interventions such as automated disease management calls with nurse follow-up for patients with diabetes have been shown to improve the care for patients with diabetes in the US.[22] Women are also more likely than men to want to communicate with their doctor by telephone,[23] and there is some

evidence that telephone consultations with GPs or nurses are a safe substitute for face-to-face consultations.[13] The results of our study suggest that female patients in particular have difficulties with physical access, and it would be worth exploring whether this could be overcome with telephone support.

Since diabetes affects more than 3% of the population, the impact of inequalities in absolute terms is likely to be profound but amenable to intervention.

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