Missed appointments in general practice: retrospective data analysis from four practices

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SUMMARY

Little is known about which patients miss appointments or why they do so. Using routinely collected data from four practices, we aimed to determine whether patients who missed appointments differed in terms of their age, sex, and deprivation scores from those who did not, and to examine differences between the practices with respect to missed appointments. The likelihood of someone missing at least one appointment was independently associated with being female, living in a deprived area, and being a young adult. Living in a deprived area was associated with a threefold increase in the likelihood of missing an appointment, and the extent of this association was the same across all four practices. Interventions aimed at reducing missed appointments need to be based upon these findings.

Keywords: *appointments and schedules; doctor–patient relations; population characteristics.*

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Submitted: 11 August 2000; Editor's response: 3 January 2001; final acceptance: 22 May 2001.

Introduction

LITTLE is known about which patients miss appointments or why they do so. At one end of the spectrum such people may be seen as a vulnerable group with multiple health problems and difficult lives, while at the other they may be regarded as nuisances who repeatedly fail to keep appointments which could have been used more gainfully for people in greater need. Indeed, while missed appointments may be welcomed by many general practitioners (GPs), they are clearly seen as a source of frustration by others. However, apart from data from two small studies of United Kingdom general practice non-attenders,[1,2] and one study from the United States,[3] there is very little about this subject in the literature in this area. The prevalence of missed appointments remains to be determined; while Wilkinson[4] quoted a figure of 4.9% from a single practice, an unpublished survey by the Doctor-Patient Partnership quoted a figure of 4.5%, based upon data from a larger number of practices, and a recent paper from Sheffield reported that 6.5% of appointments were missed.[5] This paper also reported an association between missed appointments and deprivation, but did not explore the relationship between deprivation, age, sex, and practice. It is important to consider the influence of the practice in the missed appointment rate, since there are many practice factors that may contribute.

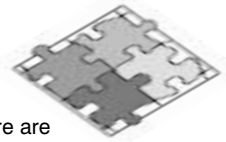
The aim of this study was to analyse routinely collected sets of general practice data from four practices to determine whether patients who missed appointments differed in terms of their age, sex, and deprivation scores from those who did not, and to examine differences between the practices with respect to missed appointments.

Method

Four practices in West and North Yorkshire participated in this study. All had thorough records of all missed appointments with a GP on their computer systems. Details of missed appointments covering a 12-month period between 1998 and 1999 were downloaded using the practices' own search software. The information was then analysed. Comparative data were examined to ensure that the computer recording of consultations had reached a 'steady state', in an identical way to that previously described.[6] The presence or absence of one or more missed appointments was determined for each individual, and patients with and without missed appointments in each practice were compared.

The postcodes of all patients were assigned Townsend deprivation scores, which were derived from the 1991 census and accessed via MIMAS at the University of

HOW THIS FITS IN



What do we know?

There have been very few studies of missed appointments; as a result there are limited data upon which interventions can be based.

What does this paper add?

The likelihood of missing an appointment was independently associated with living in a deprived area, being female and being a young adult. Interventions aimed at reducing missed appointments need to be based on these findings.

Manchester. For comparisons between practices, χ^2 tests and Fisher's exact tests were used for categorical data, i.e. sex and proportion of patients missing at least one appointment. Students' *t*-tests and ANOVA were used for age comparisons, and Mann–Whitney and Kruskall–Wallis tests for comparison of the Townsend scores between practices. Multiple logistic regression was used to assess the association between sex, age and deprivation on the likelihood of missing at least one booked appointment. For this analysis, data from all practices were used together. To determine whether the practice influenced these associations 'the practice' was included as an interaction term in the models. In this analysis, age and Townsend scores were categorised into quintiles. All statistical analysis was done using STATA version 7.

Results

There were significant differences in the mean age and deprivation levels for the registered populations between the four practices, but no differences in the sex ratio across practices (Table 1). The total proportion of patients who missed at least one appointment from all four practices was 7.7%, with a variation of between 4.2% and 11.8% between practices. Three-quarters of patients who missed an appointment only missed one, with 20% missing two, and 6% missing three or more.

The likelihood of someone missing at least one appointment was independently associated with being female, living in a deprived area and being a young adult (Table 2).

There was no significant interaction between the practice and either age or deprivation with the likelihood of missing an appointment, i.e. the odds ratios for missing an appointment associated with either deprivation or age were identical in all four practices, and therefore the same as the odds ratio calculated using data from all practices. Living in an area of greater deprivation was associated with an increased likelihood of missing an appointment, regardless of practice. However, there was a significant interaction with gender ($P<0.001$). The odds ratios for practices A and B did not differ significantly from each other or from that derived using all the data (Table 2). The odds ratio for practice C was significantly lower than the overall odds ratio and suggested that in this practice, sex did not influence the likelihood of missing an appointment (odds ratio = 1.0, 95% CI = 0.8 – 1.2), whereas in practice D there was a significantly stronger influence of sex on the likelihood of missing an appointment than the overall odds ratio for all practices (odds ratio = 95% CI = 1.7, 1.5–2.0).

Discussion

These results illustrate that living in a deprived area has a strong influence on the likelihood of missing an appointment, and that the extent of this association is the same across four differently organised practices, suggesting that practice organisation and structure do not influence the effect of deprivation. As a result, practices with more patients from the most deprived areas will have a greater prevalence of missed appointments. Young adults are more likely than children or older adults to miss appointments, and again the extent of this association is the same across all practices. The overall effect of female sex on the likelihood of missing appointments masked a large variation between practices. This may be a chance finding, although the low *P*-value for the interaction term suggests that the probability of this result being owing to chance is low. It may be that the effect of sex on missing appointments is influenced by the ways in which access to general practitioners and their appointment systems are organised, but further work is needed to explore this finding.

The data suggest that younger adults, those living in areas with greater deprivation, and women, miss more appointments in some practices. Some of these groups also consult more, and it may be that they miss more appointments as a result of their making more appointments, although the strength of these associations suggests that these factors are important. Factors such as the perceived value of keeping an appointment (this is perhaps more important for the elderly), access to a telephone or transport in more deprived areas, and poorer physical and mental health in deprived areas, may underpin these findings. The strong and consistent association with area deprivation suggests that inter-

Table 1. Details of practices and patients covering a 12-month period of data collection between 1998 and 1999.

	Practice A	Practice B	Practice C	Practice D	*P*-value	Total
Number of patients registered throughout this period	13 492	6 188	13 523	7 642		40 845
Mean age in years (SD)	39.0 (22.8)	43.8 (21.2)	42.4 (23.5)	38.0 (23.4)	<0.001	40.0 (23.0)
Number of male patients (%)	6 641 (49.2)	3 012 (48.7)	6 460 (47.8)	3 718 (48.7)	0.12	19 831 (48.6)
Practice median Townsend score (interquartile range)	2.7 (2.0 to 20.5)	-1.8 (-1.8 to -1.8)	-2.1 (-4.4 to 1.4)	6.1 (3.5 to 11.4)	<0.001	1.4 (-1.8, 5.2)
Number of patients missing at least one appointment (%)	1 344 (10.0)	261 (4.2)	642 (4.7)	901 (11.8)	<0.001	3 148 (7.7)

Table 2. Association between likelihood of missing an appointment and sex, age, and area deprivation for 40 845 patients from four practices in Yorkshire.

	n	Proportion missing at least one appointment (%)	Crude odds ratio (95% CI)	Adjusted odds ratio (95% CI)[a]
Sex				
Male	19831	6.6	1	1
Female	21014	8.8	1.4 (1.3–1.5)	1.4 (1.3–1.5)
Age quintile				
1 (≤17)	8192	7.8	1.7 (1.5–1.9)	1.7 (1.6–2.0)
2 (18–34)	8545	11.7	2.6 (2.2–2.9)	2.7 (2.4–3.1)
3 (35–48)	8344	6.9	1.5 (1.2–1.7)	1.6 (1.1–1.9)
4 (49–63)	7803	6.9	1.5 (1.3–1.7)	1.7 (1.4–1.9)
5 (≥64)	7961	4.9	1	1
Townsend deprivation score quintile				
1 (≤ -1.75)	12964	4.2	1	1
2 (-1.74–0.64)	3598	7.5	1.8 (1.6–2.1)	1.8 (1.5–2.1)
3 (0.65–2.00)	7245	7.4	1.8 (1.6–2.0)	1.7 (1.5–2.0)
4 (2.01–6.12)	7806	10.6	2.7 (2.4–3.0)	2.7 (2.4–3.0)
5 (≥6.13)	7405	11.0	2.8 (2.5–3.1)	2.7 (2.4–3.0)

[a] Adjusted for sex, age and area deprivation.

ventions to decrease the number of missed appointments may require improvements in the material conditions of people living in these areas[7] and may not be influenced by interventions at the practice or individual level.

Several other factors that could not be assessed in this study — primarily because these factors are complex and hard to measure — may account for some, but probably not many, of the variations between practices in the prevalence of missed appointments. These include ways in which access to GPs and their appointment systems are organised (for example, large numbers of patients may attend an open surgery rather then make an appointment); the ease of making appointments; the proportion of review appointments, and how far in advance appointments can be booked.

While the practices in this study were atypical, in that they were members of a research network, they varied in terms of their organisation, location and size. The numbers of missed appointments for each patient were very similar to those reported elsewhere.[5] Therefore, we believe that these findings may have a more general application.

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Acknowledgements

We would like to thank Alastair Carson from the Department of General Practice, University of Glasgow, for assistance with accessing the Townsend scores. This work was carried out while Richard D Neal was Director of Yorkshire Primary Care Research Network (YReN). YReN and Fisher Medical Centre receive funding from the National Health Service Executive (NHSE) Northern and Yorkshire. The views expressed in this paper are those of the authors and not necessarily those of NHSE.