

Computer use by general practitioners in Scotland

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SUMMARY

Background. Despite the widespread adoption by general practitioners (GPs) of desktop computers, there has been very little evaluation of the way in which the computer is actually used during consultations and the way in which it affects patient satisfaction.

Aim. To ascertain the extent to which the computer is used in the consultation and to investigate the possible relationship between computer use and patient satisfaction.

Method. Six GPs completed a short questionnaire about the extent to which they use the computer during surgeries. Eighty-four consultations from the surgeries of these GPs were video recorded. Patient satisfaction data on these 84 patients were collected at the time of the surgery using the previously validated Consultation Satisfaction Questionnaire.

Results. All six GPs stated that they usually used the computer during consultations. However, video observation revealed that the computer was used in just 51% of surgeries. The proportion of time that the computer was used for varied from 0.03 to 0.4, with a mean value of 0.12. The commonest function for which the computer was used was prescribing. The consultations in which the computer was used (CU) were on average 148 seconds longer than the non-computerized consultations (NCU). There was no difference in patient satisfaction between the two groups.

Conclusion. Despite this group of GPs having a self-declared interest in the use of computers, the extent to which the computer was used was much lower than expected from the GPs' self-reported use. This may be partly explained by the fact that using the computer takes up valuable time within the consultation and does not appear to contribute to patient satisfaction. If desktop computers are to be used to their full potential in general practice, more work is required to evaluate their impact on the consultation process itself.

Keywords: computer use in general practice; GPASS; video-recorded consultations.

Introduction

COMPUTING has become such an accepted element of primary care in Britain that virtually every general practice now has a computer. The application of this technology has filtered

into the consultation itself with the arrival of desktop computers on over 60% of doctors' desks.¹ The Government currently spends around £47 million in this area every year,² thus indicating that general practice is seen as a fundamental part of the NHS information technology strategy.³

Although some benefits of general practitioner (GP) computer use will be realized outwith consultations, any immediate impact on patient care is likely to be felt during the consultation itself. As new systems are introduced, the impact of computers should be observed and evaluated. However, the opportunity for study is often neglected. Only two evaluations of the impact of computers on the consultation process have been published in the past 10 years.^{4,5} Without evaluation of how computers are used in the consultation, inappropriate behaviours are likely to continue⁶ and beneficial aspects will not be implemented in future systems.

This study investigates the extent to which the Scottish-based computing system, GPASS, whose software is free to GPs in Scotland, is used during consultations, and examines the relationship between computer use and patient satisfaction.

Method

General practitioners

Nineteen GPs in the Greater Glasgow and Lanarkshire Health Board areas who were already involved in studies of the impact of computers on medical practice were asked to participate in a secondary study that aimed to evaluate the direct effects of computer use on consultations using the analysis of video recording. Six GPs agreed and, at the time of recruitment, each completed a short questionnaire about their pattern of computer use including the aspects of the consultations for which it was used. One surgery from each GP was recorded.

All of the practices were visited two weeks before the date of the recorded consultation so that the process of data collection could be explained to the GPs and the reception staff. At this visit, the surgery to be recorded was identified. The surgeries were identified in advance so that patients could be pre-warned of the presence of the video camera at the time of booking their appointment. A total of 84 consultations were recorded.

Patients

On the day of the recording, the camera was set up by the researcher before the surgery started. All patients attending the prearranged surgeries were invited to participate in the study. The researcher (HR) remained in the reception area throughout the surgery to explain to each patient that the purpose of the video study was to observe the way in which the GP used the computer. Consent was obtained in accordance with the General Medical Council (GMC) regulations⁷ using a specially designed consent form. Written consent was obtained from the patients before their appointment and, if the patient was under 16, consent was obtained from a parent. In case any sensitive topics had occurred during the consultation, patients were asked for their consent to release of the videotape after the consultation. In addition, patients were asked to complete a patient satisfaction questionnaire immediately after the consultation.⁸

All of the 84 video-recorded consultations were viewed by one

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medically qualified observer (HR). Eight of the consultations, part of one GP's surgery, were viewed by a second observer to assess the reliability of the data collected.

Study instruments

Ranking of a complex activity such as computer use is difficult, as it can be measured in a number of different ways. After piloting in a practice not involved in the study, three criteria were selected for use in this study: (1) whether or not the computer was used at all during the consultation; (2) the proportion of time within the consultation for which it was used; and (3) the type of activity for which it was used (prescribing, health promotion, history). The total duration of the consultation, measured from the time that the GP and patient began conversing to the moment conversation stopped, was also recorded, so that duration of computer use could be expressed as a proportion of the total consultation time.

A video assessment form to analyse the consultations was designed for this study. Each presentation was classified into one of four possible categories: 'psychological' (e.g. depression, anxiety); 'minor physical' (e.g. 'colds'); 'major physical' (e.g. angina, diabetes); and 'health checks'.

The impact of the computer was most likely to be felt by the patient at the time of the consultation, and so the Consultation Satisfaction Questionnaire (CSQ) was used to measure satisfaction.⁹ The CSQ is reliable and valid and has been used in similar patient groups before. The instrument comprises a series of 18 questions scored from 1 to 5 on a five-point Likert scale, where 1 indicates satisfaction and 5 indicates dissatisfaction. The CSQ was analysed according to the method described by Baker,⁹ whereby mean values for each of four subscales were calculated from groups of questions. The subscales were 'general satisfaction', 'professional care', 'depth of relationship', and 'perceived time'.

All study instruments (GP computer-use questionnaire, video-analysis instrument, and CSQ) were piloted in a non-study practice before being applied to the study group.

Data management and analysis

For the analysis of GP computer use, the consultations were divided into two groups, those in which the computer was used (CU) and those in which it was not used (NCU).

Data on GP computer use and patient satisfaction were managed and analysed using the Statistical Package for the Social Sciences (SPSS) for Windows. Categorical variables are presented as count and percentage, and non-normally distributed continuous variables as median and range. Comparisons between consultations in which the computer was used and those in which it was not used were carried out using chi-squared tests for categorical data and Mann-Whitney tests for the distribution of free continuous data. Comparisons of CSQ subscales for the two consultation types were carried out using *t*-tests, and the subscale variables are presented as median and standard deviation (SD).

Results

Six GPs out of the original 19 agreed to participate. The size of their practices ranged from three to eight partners; one was in a rural area and the rest were urban. None of the practices were fundholding. All six GPs had a computer on their desk and stated in the original questionnaire that they usually used it during consultations.

Within the six video-recorded surgeries, 104 patients were eligible for inclusion and were asked to participate, and 84 (81%) agreed. Of these, 74 (88%) agreed to complete a patient satisfaction questionnaire, and 50 (68%) of these were completed fully.

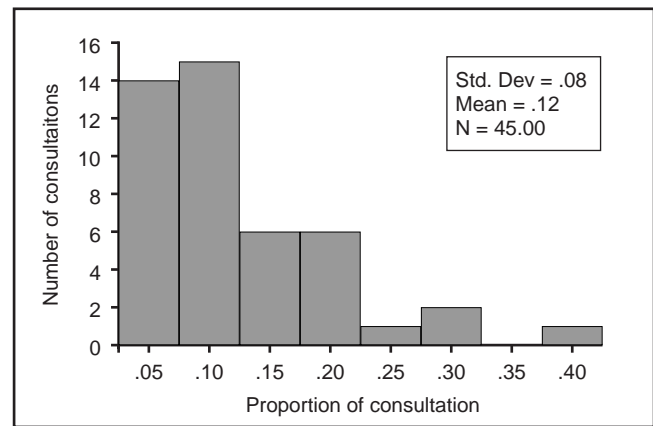


Figure 1. Histogram showing the proportion of time for which the computer was used.

Figure 1 shows the range of times for which the computer was used. Use by individual practitioners is described in Table 1. The number of consultations in which the computer was used (CU) was just 43 (51%), leaving 41 (49%) in which it was not used (NCU). During consultations in which the computer was used, the proportion of time spent using the computer ranged from 0.03 to 0.40, with a mean value of 0.12. For all consultations, the median proportion of time was 0.06. Patterns of computer use varied widely between GPs, from one GP (a) who used the computer in every consultation to another (f) who did not use it in any of the recorded consultations (Table 1). The commonest function for which the computer was used was repeat prescribing, with the history next and health promotion very much less (Table 1). The computer could be used for more than one function in each consultation, and so the totals for individual functions add up to more than the total number of consultations.

There were no differences in age, sex, or presenting complaint between the CU and NCU consultations. There was, however, a significant difference in the length of consultations between the two groups (Table 2). Patient satisfaction was analysed for the four subscales described above, and no differences were found (Table 3).

Discussion

The most striking observation arising from this study is how little desktop computers are actually used, even by a group of self-reported, computer-using GPs. The doctors used the computer in just over half of all consultations and, in those, it was used on average for 12% of the total consultation time. When it was used, it was mainly for prescribing and rarely for other aspects of the consultation. Moreover, the extent to which GPs stated that they used the computer at the beginning of the study was significantly smaller than that ascertained by direct observation.

In recruiting patients for a video study, there is a trade-off between maximizing participation by warning patients of the presence of the video camera and recruiting a more representative sample by approaching patients on the day of their appointment. In this particular study, we were interested in the behaviour of the GP and the use of the computer, and we felt that maximizing the rate of consent was of paramount importance. Considering the complex nature of the consent process, the agreement of 81% of patients to release the videotapes was reasonable.

It may be argued that the findings of this study apply only to the particular computer system used by the study GPs, that is GPASS, but the lack of comparative data for other systems

Table 1. Pattern of computer use for each GP.

GP	Number of consultations	Number (%) of consultations computer used	Number (%) of consultations computer used for history	Number (%) of consultations computer used for prescribing	Number (%) of consultations computer used for health promotion
a	17	17 (100)	14 (82)	10 (59)	1 (6)
b	15	6 (40)	1 (6.7)	7 (47)	2 (13)
c	11	10 (91)	2 (18)	10 (90)	0 (0)
d	8	3 (38)	2 (25)	5 (63)	0 (0)
e	11	7 (64)	0 (0)	3 (27)	1 (9)
f	22	0 (0)	0 (0)	0 (0)	0 (0)

Table 2. Characteristics of the consultations.

	Computer use (n = 45)	No computer use (n = 39)	Statistical test
Age (years)	Median 35 Range 1 to 79	Median 39 Range 2 to 80	M-W Z = -0.24 P = 0.81
Sex	n = 21 47% male	n = 14 36% male	$\chi^2 = 1.00$ df = 1 P = 0.32
Condition type			
Psychological	4 (9%)	3 (8%)	$\chi^2 = 0.96$
Minor physical	8 (18%)	10 (26%)	df = 3
Major physical	24 (55%)	21 (54%)	P = 0.81
Health checks	8 (18%) (missing 1)	5 (13%)	
Length of consultation (seconds)	Median 465 Range 60 to 1330	Median 317 Range 85 to 960	M-W Z = -2.02 P = 0.04

Table 3. Patient satisfaction measured by 'Consultation Satisfaction Questionnaire'.

Questionnaire subscales	Computer use (n = 27)	No computer use (n = 23)	Statistical test
General satisfaction	Mean 1.7 (SD 0.7)	Mean 1.7 (SD 0.6)	t = 0.35 P = 0.73
Professional care	Mean 1.7 (SD 0.5)	Mean 1.7 (0.4)	t = -0.10 P = 0.92
Depth of relationship	Mean 2.2 (SD 0.8)	Mean 2.3 (SD 0.6)	t = -0.8 P = 0.44
Perceived time	Mean 2.0 (SD 0.7)	Mean 1.8 (SD 0.7)	t = 1.55 P = 0.13

means that we cannot be certain on this issue.

We have shown that the CU consultations were significantly longer than NCU consultations. In the CU consultations, computer use accounted for an average of 12% of the overall consultation time. Although the patients were not randomized as to whether the computer was used or not, and thus subject to potential bias, the results corroborate those from previous research, which found that CU consultations were 48–90 seconds longer^{5,10,11} than NCU consultations and that doctors who used a computer did so for an average of 7% of the total consultation time.⁴

Patient satisfaction is affected by many factors and not simply whether or not a computer was used in the consultation, for example, patient age and sex, presenting symptom, and consultation length.¹² The only one of these factors that differed significantly between the two groups (CU and NCU) was consultation length. CU consultations were on average 148 seconds longer than NCU consultations. However, the CU consultations were

not associated with higher levels of patient satisfaction. This might be explained by the observation (on viewing the videotapes) that the extra time was spent interacting with the computer rather than with the patient.

The problem of increased consultation length would seem to be a major drawback to computer use during consultations. In this study, the computer added more than two minutes per consultation. In a working week, during which GPs see 150 patients, using a computer for every consultation would add more than five hours' extra work.

If desktop computers are to become more than simply expensive prescription pads, then these problems have to be addressed. There are plans to abolish the requirement for duplication of records, and this may help. In addition, GPs must be able to integrate their computing system into consultations. Only when existing desktop computer systems are simple enough to make their use second nature will we be able to ensure that their use leads to improved patient care.

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