Does awareness of being video recorded affect doctors' consultation behaviour?

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SUMMARY. Four general practitioners, two of whom had no previous experience of video recording in the consultation, took part in a study to assess the effect of awareness of video recording on their consultation behaviour. A video camera was sited unobtrusively in each consulting room for a month during which five randomly selected surgeries were recorded with the doctors being informed at the time, and five without their being informed.

The video recorded consultations were analysed using TIMER, a tool designed to measure objectively behaviour in terms of physical, verbal and secondary activities in consultations. The proportions of time spent on the 27 consultation parameters were compared when doctors were aware and unaware of the recording, using analysis of variance. This demonstrated only one significant difference, in the low frequency parameter of the doctor's exploration of the patients' concepts ($P<0.05$). In a secondary analysis of the first four consultations in each surgery, where any effect of the presence of the video camera would be expected to be most marked, there was again only one significant difference in the 27 parameters (in patient preparation; $P=0.01$).

No significant difference owing to awareness of video recording was found in consultation length, the number of problems dealt with, or previous inexperience of video recording. When surgeries at the start of the month were compared with those at the end, four significant differences ($P<0.05$) out of 108 areas were demonstrated both when the doctor was aware and unaware of video recording, and there was no consistency in the direction of the differences.

When tested for sensitivity to differences between doctors, the TIMER method was shown to have the sensitivity to detect real differences on this sample size.

This study offers no evidence that video recording has an effect on objective measures of doctors' consultation behaviour, and it offers support for the use of video recording as a tool for teaching and research.

Introduction

VIDEO cameras are used increasingly in research,[1,2] undergraduate education[3,4] and postgraduate education,[5-7] especially vocational training.[5] They are now being used for accreditation, including fellowship by assessment of the Royal College of General Practitioners (*Guide to assessment for fellowship of the Royal College of General Practitioners*. Unpublished document, 1989). Their use and acceptability has sometimes been affected by complaints of methodological bias or the 'Hawthorne' effect.[8] For example, researchers are concerned that putting in a video camera may alter the behaviour of subjects. Students and trainees complain that the camera makes their consultations 'artificial', and the use of video recordings for assessment has been dogged by worries about bias — are the video recorded consultations actually representative of a doctor's normal behaviour pattern?

Most studies concerning the effect of video recording have concentrated on effects on patients.[9-11] One study has demonstrated that the video recording made no appreciable difference to patient stress and arousal compared with the control consultations (whereas this was not the case when a second doctor was present).[12]

The effect of knowledge of being video recorded on the doctor, and therefore on those aspects of the consultation under his or her control, has been largely ignored, owing to methodological problems. The issue is crucial, however, because of the increasing use of video recording in education, research and accreditation.

An intervention study was designed to test the null hypothesis that awareness of videotape recording would have no effect on objective measures of doctors' consultation behaviour. In order to do this the conditions for the patients in both the control and the intervention groups had to be the same. Since it is unethical to video record without a patient's consent and impossible in practical terms to do so without the doctor's knowledge and consent, a true 'control' comparison was not possible. However, although patients had signed consent forms and the doctors were aware throughout the month that some surgeries would be video recorded, the study design came as close to a control as is practically possible. This 'control' situation was compared with one in which the doctor was definitely aware that he or she was being recorded.

Method

A video camera was placed in a high corner of each of four general practitioners' consulting rooms in turn for a period of one month with that doctor's consent. The camera was wired through the roof space to a video recorder in the administrative area. The lights on the video recorder were covered to prevent doctors from knowing when they were being recorded. There was also no sound or light from the camera to indicate that it was in use. The surgeries for the study were chosen at random (by CSE) and were telephoned through to the practice manager who was the only member of the practice aware of those recordings which were made without the doctor's knowledge.

Every patient or guardian of a patient consulting with a doctor being studied was asked to sign a consent form for video recording regardless of whether the recorder was being used. Those who refused permission were not video recorded.

Each general practitioner had 30 surgeries during the experimental period. Doctors were informed that five surgeries (that is, only a small proportion of the total) would be recorded without their being informed beforehand. On a further five surgeries the doctor was informed by the practice manager at the start of the surgery that he or she was definitely being recorded on that occasion. A total of 339 consultations were analysed (see Table 1): 164 when doctors were aware of recording and 175 when they were not aware. Differences between general practitioners in the number of consultations analysed were accounted for by consultations involving more than one patient, patients refusing to be video recorded (the overall refusal rate was 17%) and differences in numbers seen in individual surgeries.

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Two of the doctors concerned had been video recorded for teaching and research purposes on many occasions. One doctor was a new partner to the practice who had not experienced video recording before and the fourth was a vocational trainee with limited experience of video recording.

Analysis

The recordings were analysed using time interval medical event recorder (TIMER), a tool that has previously been used to detect effects from computer use during the consultation.[2] Each consultation is examined five times and is scored at five second intervals for physical activities, verbal activities and secondary task activities in addition to a number of general parameters (Appendix 1). Because of the variation in the length of consultations the amount of time allocated to the different areas was converted into a percentage of the length of each consultation (for three types of activity: physical, verbal and secondary task). The overall consultation duration was analysed using raw data.

Using SPSSX, actual time data were normalized using $\sqrt{x2}$ and percentages of consultation duration were normalized using Probit. To test whether there were any significant differences in the usage of time by all four doctors combined when aware or unaware of video recording, the consultations within each of the 20 surgeries under each condition were analysed. This analysis involved measuring the proportion of time within each consultation devoted to each activity (Appendix 1), applying the Probit normalization, and then employing the analysis of variance. This method was chosen because there were different numbers of consultations under each experimental condition.

Reliability

The coding was all carried out by one person (CSE). A sample of 14 consultations covering 31 problems were chosen at random to check intra-rater reliability (the coder's consistency over a period of time). The time taken to analyse a single consultation (on average 50 minutes) precluded the checking of larger numbers of consultations. Of the items examined by the TIMER method, intra-rater comparisons at least one month apart yielded only one Spearman correlation coefficient below 0.8 (patient education at 0.72). Two further experienced coders examined a different random sample of 13 consultations covering 30 problems to check the inter-rater reliability of the main coder (to check that the coder was not deviating consistently from the rules of TIMER). Correlation coefficients ranged from 0.6 and 1.0, with only six out of 56 less than 0.8.

Results

For the four doctors overall, the mean consultation length was 7.8 minutes for the 175 consultations when doctors were unaware and 8.4 minutes for the 164 consultations when they were aware of video recording, but this difference was not significant (analysis of variance). There were no significant differences in consultation length for any of the general practitioners when they were analysed separately. Video recording also had no significant effect on the number of problems dealt with by each doctor (Table 1), again using the analysis of variance.

Table 2 shows the mean percentage of time allocated to each type of activity as measured by TIMER for consultations where general practitioners were aware of being recorded and those where they were not.

In the analysis of the 27 factors (covering doctor and patient activity) only one factor — the doctor's exploration of patients' concepts — demonstrated a significant difference between consultations where doctors were aware of recording and those where they were not ($P<0.05$). Comparison between awareness of video recording for the 89 consultations for the two doctors experienced in video recording and the 75 consultations for the two who were inexperienced, with the 96 consultations for experienced doctors and 79 for inexperienced doctors when unaware of recording showed no significant differences in any of the 27 factors. Since any effect might be expected to be at its greatest in the earlier consultations in a surgery, the first four consultations in all surgeries for all four doctors when aware

Table 1. Mean number of problems dealt with and mean consultation length for consultations with each general practitioner for the two experimental conditions.

	GP aware of video recording			GP not aware of video recording		
	n	Mean no. of problems	Mean consultation length (min)	*n*	Mean no. of problems	Mean consultation length (min)
GP 1	51	2.48	9.6	46	2.41	9.4
GP 2	38	2.54	8.4	50	2.63	9.5
GP 3	42	1.98	5.8	40	2.14	7.8
GP 4	33	1.51	6.7	39	1.61	6.2
All GPs	164	2.17	8.4	175	2.23	7.8

n = total number of consultations analysed.

Table 2. Mean percentage of time spent on the 27 physical, verbal and secondary task activities for consultations by all four general practitioners for the two experimental conditions.

	Mean percentage of consultation length			
	GP aware of video recording (*n* = 163)		GP unaware video recording (*n* = 175)	
	Doctor activity	Patient activity	Doctor activity	Patient activity
Physical activities[a]				
Administration	*39.0*	*3.1*	*39.3*	*2.8*
Preparation	*13.3*	*13.6*	*12.7*	*15.6*
Examination	*10.1*	*10.1*	*10.2*	*10.2*
Conversational posture (both doctor and patient)	*34.0*		*35.3*	
Verbal activities				
Medical questioning	*6.3*	*2.1*	*5.8*	*2.3*
Medical information giving	*23.3*	*27.9*	*23.9*	*29.1*
Social discussion	*2.4*	*3.6*	*2.7*	*4.1*
Instruction	3.9	*<0.1*	*4.0*	*0.1*
Silence (both doctor and patient)	*30.4*		*27.9*	
Secondary task activities				
Exploring patient's concepts	*3.0*	*4.6*	*4.0*	*4.5*
Patient education	*8.0*	*2.2*	*7.9*	*1.6*
Management sharing	*0.8*	*0.1*	*1.5*	*0.1*
Prevention	*0.8*	*0.2*	*0.7*	*0.5*
No secondary task (both doctor and patient)	*80.3*		*79.2*	

n = number of consultations analysed.
[a]Total of doctor and patient activity is more than 100% because doctor and patient can be active at the same time.

of recording were compared with the first four consultations when doctors were not aware. Using the analysis of variance ony one significant difference emerged from the 27 factors — preparation by the patient ($P=0.01$). Since it would be expected that one in 20 random analyses would show a difference at the $P=0.05$ level, these differences cannot be taken as evidence to reject the null hypothesis. Using the first four consultations in surgeries the two general practitioners with experience of video recording were compared with the two with no previous experience but no significant differences were found.

The data were next examined for a difference between the recordings at the start of the month compared with those at the end. For all the four doctors the consultations in the first surgery when aware of recording were compared with the last surgery when aware of recording and similarly for the first and last surgeries when unaware of the video recording. Use of the *t*-test for independent samples on a doctor by doctor basis demonstrated four significant differences ($P<0.05$) out of 108 factors (27 factors, four doctors) when aware and another four out of 108 factors when unaware of recording. This number of differences was also less than what would be expected randomly in the analysis of a large number of factors and there was no consistency in the direction of the differences. This, again, does not offer sufficient evidence to reject the null hypothesis.

The data were examined for confirmation that the tool used, TIMER, was sensitive enough to have detected any differences which might be present. Using the analysis of variance, comparisons between doctors demonstrated significant differences ($P<0.05$) in 13 out of 27 TIMER items, of which 10 had $P<0.01$. Inter-doctor comparisons demonstrated significant differences in consultation length ($P=0.001$) and number of problems dealt with ($P=0.001$). In a comparison between the two doctors with experience of video recording (who were more experienced in primary care as well) and the other two doctors, 11 significant differences ($P<0.05$) out of 27 TIMER areas were found.

Discussion

Since any objective study of consultation content requires either a recording device or an observer, a true control situation in a study designed to evaluate the effect of a recording device is both impracticable to achieve and unethical. The alternative adopted in this study was to have the video recorder present for a whole month. It was therefore a comparison between consultations when the doctor knew that he or she was being recorded against those where the doctor knew there was only a low likelihood of being recorded. This only fails to represent a controlled comparison if the doctors behaved differently for a whole month because they knew the potential existed for video recording. When asked for their subjective impressions, participating doctors all said that when they were not told they were being recorded, they assumed that no recording was being made. Certainly the behaviour of doctors in the surgeries when they were unaware of the video recording indicated that this was so since several personal telephone calls were made between patient consultations.

Considering the array of measures applied to the consultations and the random caseload that exists in general practice, there was a strong similarity in the doctors' behaviour when aware and not aware of video recording. These findings, therefore, offer no evidence that awareness of video recording has an effect on objective measures of doctors' consultation behaviour. Any effect that does exist is likely to be of no practical importance and is certainly substantially less than any differences between doctors.

This conclusion only holds for the four general practitioners in this particular practice. However, comparison between the two doctors with experience of video recording and the two novices showed no difference, and there is nothing particularly unusual about the practice that would predict an abnormal response to video recording by the doctors.

Whether a video taped sample of consultations can be said to be a reliable indicator of a doctor's 'normal consultations' depends on several factors. This research only measured the quantity of physical, verbal and secondary task activity and did not attempt to assess differences in more qualitative measures. While a general practitioner may behave similarly when video recorded, his or her decision making could be degraded or enhanced. Before accepting that video recording has no effect on the consultation, such qualitative factors need to be examined. The sample size also needs consideration. However, for the parameters examined here, the consistency of doctor behaviour even in small samples was remarkable. Our data suggests that as few as 10 consultations may give an accurate reflection of an individual doctor's activities. Where clinical judgements were being examined it is likely that a larger sample would be required to allow for the variety of the general practice case mix.

Within these constraints it is possible to conclude that the anxiety often expressed by doctors — the 'I won't behave normally if a camera is there' — is unfounded.

Appendix 1. *Consultation parameters scored by time interval medical event recorder (TIMER).*

The consultation duration is measured and general consultation events — interruptions, problems, prescriptions, referrals and investigations — recorded. Then specific activities in each of three broad areas (physical, verbal and secondary task) are scored at five second intervals for both the doctor and the patient. Since three factors involve both patient and doctor — conversational posture, silence and no secondary task — there are 27 factors which can be allocated proportions of time (Table 2). While doctor and patient can be physically active at the same time, only one verbal and one secondary task can be scored at any one time.

General parameters

Consultation length
Number and nature of problems discussed
Number of prescriptions issued
Whether investigation and/or referral carried out
Interruptions

Physical activity

This is coded from the pictures alone. Doctor activity and patient activity is recorded at each five second interval, for nine parameters: four doctor, four patient parameters and one joint parameter (conversational posture).

Administration (internal) — includes any reading, writing, reference to papers by doctor or patient which does not require intervention by external agents.

Administration (external) — includes administration that involves external agents or third medical parties (includes telephoning).

Preparation — any activity by doctor or patient which is preliminary to another activity, for example preparing for an examination or preparing to leave.

Examination or treatment — the doctor carrying out an examination or giving treatment and the patient receiving these.

Conversational posture — a default category which occurs when neither doctor nor patient is doing anything else.

Verbal activity

This is coded from the soundtrack alone. Doctor and patient verbal activity is entered for each time interval; if both are speaking at once it is coded according to who started first. Nine parameters are scored: four doctor, four patient parameters and one joint parameter (silence).

Medical questioning — any questioning by patient or doctor relating to any aspect of the presenting patient's health.

Medical information giving — any information given by the patient or doctor relating to the presenting patient's health.

Social discussion — any discussion by patient or doctor which is of no medical relevance to the health of the presenting patient.

Instruction — giving directions, such as the doctor asking the patient to take breaths or saying how to take medication or the patient telling a doctor to take his or her blood pressure.

Silence — the default category when there is no verbal activity.

Secondary task activity

Generally the doctor will be responsible for taking the initiative to fulfil secondary activities, although patient volunteered information may fulfil a task with no input from the doctor. The activities are scored for doctor and patient, according to who was the initiator, but no two activities can be judged to occur simultaneously. Nine parameters are scored: four doctor, four patient and one joint parameter (no secondary tasks).

Exploring patient's concept — refers to information from the patient which extends beyond a description of his symptoms, but nevertheless relates to problems created by his illness. It includes patient's medical ideas, causes for illness, and discussion of the effects that he thinks his illness or its treatment has on him and attempts by the doctor to elicit this information.

Patient education — any input from the doctor, either doctor or patient initiated, which increases the patient's understanding (not just the name) of illness and/or prevention.

Management/decision sharing — includes any involvement of the patient, either doctor or patient initiated, in management of the presenting, continuing or opportunistic problem.

Prevention — any reference, either doctor of patient initiated, to a procedure or information intended to procure an arrangement to screen for a preventable disease.

No secondary task — the default category when there are no secondary tasks occurring.

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