Computers in the Examining Room: The Patient's Perspective

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CompuHx is an Interactive Health Appraisal System (IHAPS) used in the examining room at Kaiser-Permanente's San Diego Department of Preventive Medicine to record patient information, assist in diagnosis, and provide a legible summary of findings. The purpose of the present project was to examine the impact of computer use in the examining room on patient satisfaction with the Health Appraisal experience. Survey results showed no significant differences in patient satisfaction between patients whose examiners used CompuHx and those whose examiners did not. These findings indicate that, in the eyes of the patients surveyed, clinician use of a computer in the examining room did not depersonalize their relationship with the clinician, nor did it enhance satisfaction with the thoroughness of the exam or confidence in the examiner's findings.*

INTRODUCTION

The use of computerized information systems in the "health maintenance" or preventive care setting to collect and store patient information comprises an essential element of the efficient health care system of the future. Most research on computer use by clinicians, however, has focused on informatics in hospitals and in specialty medicine [1,2]. The little research that has been done on computers in the consulting room comes from studies conducted several years ago in the United Kingdom where it is estimated that 75-90% of primary care physicians work in computerized practices and over 60% use computers during consultation [3,4,5,6].

Results from the UK studies on patient reactions to computers in the consulting room indicate that the overall impact on patients is small [7,8,9]. One study from the early stages of computer use, however, did show increased stress in patients with dyspeptic symptoms whose physicians used a diagnostic computer system. The researchers urged doctors to take care to preserve their 'human touch' [10], a concern still debated in more recent computer literature [11]. Also focusing on the patient encounter, Brownbridge, Lilford, and Tindale-Biscoe found that midwives using a computer were inclined to give less information to patients, especially when they were new to the computer, and used more closed questions and leading questions [9]. A more recent study conducted in Israel indicated that primary care physicians who use computerized medical records during a patient encounter had changed their working styles to devote more attention to the computer and longer uninterrupted intervals for data entry than when using the traditional paper record. These physicians changed from a "conversational pattern" in which they alternated frequently between the patient and the record to a "block pattern," first establishing a number of items of information and then entering them into the record [12]. The study did not, however, include patient reactions to the encounter.

The present research focuses on patients in the second phase of a comprehensive study of an interactive health appraisal system in preventive medicine [2]. In the first phase of the study, administrators and some clinicians hypothesized that the use of CompuHx in the examining room would enhance patient satisfaction with the thoroughness of the exam and their confidence in the examiner's findings. Other clinicians, however, expressed concern that using the computer in the examining room might depersonalize patient care. While most CompuHx users did not feel that it was a problem, they mentioned making a concerted effort (especially when they were first learning the system) to maintain eye contact with patients rather than focusing on the computer terminal or keyboard. The present paper addresses these concerns by comparing the reactions of patients whose clincians use CompuHx to the reactions of patients whose clincians do not use the computer.

HEALTH APPRAISAL

The Kaiser-Permanente Medical Care Program provides a detailed, complete history and physical examination to 50,000 members per year in the San Diego Department of Preventive Medicine. The majority of these patients are the "worried well," patients whose care does not require the traditional,

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costly, sickness-care portion of the organization [13]. Despite this fact, however, personal interactions with the clinician are an essential part of the health appraisal process for these patients. Recent interviews with 53 patients indicated that approximately 60% came with specific symptoms, concerns, or fears to discuss [14]. All examinations are performed by a nurse practitioner or physician assistant ("examiner"), with a physician always available for consultation. The minority needing further care are guided to the appropriate physician. Five of the 22 examiners are CompuHx system users.

COMPUHX IN THE EXAMINING ROOM

CompuHx is designed to record patient information, assist in diagnosis, and provide a legible summary of findings. CompuHx enforces thoroughness by (1) addressing all information contained in the original patient questionnaire, (2) ensuring that all information necessary for diagnosis has been obtained, and (3) recording/storing/reproducing the information in a legible, structured, and easily accessible medium. CompuHx is intended ensure the performance of the examiners and the quality of patient care.

Two categories of information are initially stored in the data base: patient history (based upon a questionnaire completed by the patient prior to the visit) and lab values. Stored in the examining room computer are almost 100 screens, each specific to a question in the medical history. When queried by the examiner, the program displays screens specific to questions answered affirmatively (or left unanswered) on the questionnaire. Following the patient history screens is a series of 20 screens to be used in similar fashion during the actual physical examination. At the end of the physical exam, the computer displays a list of all findings and diagnoses. The examiner eliminates findings that have been subsumed, prioritizes the diagnoses, relating a condition to a referral if necessary, and "ties" medications to a condition if prescribed. When complete, all information is sent back to the data base and a written summary of the patient history and medical examination is generated along with a "to do" list. A summary letter to the patient discussing the implications of findings is currently in alpha testing.

STUDY METHODOLOGY

Surveys

During Fall 1994, 800 Health Appraisal patients were asked by examiners to complete a survey evaluating their experience at the Health Appraisal clinic. A total of 428 patients completed surveys for a response rate of 54%. Respondents included 195 patients whose examiners did not use the CompuHx computer program and 233 patients whose examiners used CompuHx during the history and physical exam.

Survey design was based on past research indicating that patient satisfaction is related to the affective quality of the provider's manner, the amount of information conveyed, and the provider's technical and interpersonal skill [15]. Of particular value to patients are interpersonal skills of the practitioner. The following scales were included on the survey:

Global Satisfaction with Health Appraisal: 6-item scale developed for this project measuring different aspects of the patient's experience at Health Appraisal (Cronbach's alpha=.92).
Cognitive: 6-item scale measuring perceptions of examiner's explanations and information and patient's understanding of and confidence in the findings of the exam (Cronbach's alpha=.96) [16].
Affective: 7-item scale measuring perceptions of the treatment relationship, the examiner's positive regard for the patient and willingness to listen to his/her concerns (Cronbach's alpha=.98) [16].
Behavior: 4-item scale measuring perceptions of the thoroughness of the examination and confidence in the examiner (Cronbach's alpha=.97) [16].
Acceptance of Advice: 5-item scale measuring patient's willingness to accept examiner's advice (Cronbach's alpha=.90) [17].
Computer in Exam Room: 3-item scale measuring patient's attitude toward the use of the computer by the examiner--answered by CompuHx group only (Cronbach's alpha=.84) [9]
Responses to the scales, as well as to selected single items (e.g., personal computer use by patients), were analyzed for the total sample and for the CompuHx and non-CompuHx patients separately.

FINDINGS

Patient Demographic Data

Demographic data indicated patient gender to be the only significant difference between the CompuHx and non-CompuHx groups (see Table 1). There was a significantly larger proportion of males in the CompuHx group. Approximately 50% of both male and female patients used computers at home or in the office; computer users were significantly younger than patients who did not use computers.

Table 1
Selected Demographic Characteristics
(n=428)

	Total Sample	Exams with CompuHx	Exams without CompuHx
Mean Age	56.3 yrs	57.5 yrs	54.8 yrs
Gender			
Male	52.1%	60.4%	42.3%
Female	47.9%	39.6%	57.7%
Chi-Square (1, N=424) = 13.92, p<.001.			
Uses a Computer at Home or Work			
No	52.1%	54.6%	49.2%
Yes	47.9%	45.4%	50.8%

Impacts of CompuHx

There were no significant differences (two-tailed t-tests) in any of the satisfaction scales or items between patients whose examiners used CompuHx and those whose examiners did not (see Table 2).

CompuHx patients "agreed" with the positive statements in the "Use of Computer in the Exam Room" scale (mean=3.95, s.d.=0.93). They also "agreed" with the statement, "If given a choice, I would choose an examiner who uses a computer" (mean=3.83, sd=1.15). They "disagreed" with the statement, "The examiner seemed to have trouble using the computer" (mean=1.74, sd=1.26). There were no significant differences between patient satisfaction with different examiners for those surveys where examiner codes were available.

Overall, there was a slight positive correlation between satisfaction and age, i.e., older patients were slightly more satisfied. This finding is supported by literature that indicates that older patients tend to express higher satisfaction with quality of care [15].

Gender differences were also examined since there were significantly more males in the CompuHx response group. Findings showed that, in both groups, female patients were slightly more satisfied with examiner behavior and said they were more likely to take the examiner's advice. Gender differences were statistically significant for the CompuHx group and the total sample (see Table 3).

In all groups, patients who used computers themselves were slightly less satisfied with various aspects of Health Appraisal. This finding, however, may simply reflect patient age, rather than computer use, as a predictor of satisfaction. Patients who use computers are significantly younger than patients who do not (mean age=49 years vs. 63 years, p=0001, t =9.92, df=401) and younger patients in this study (see above) and in the literature are less satisfied.

Study Limitations

Findings are based on a sample of patients who agreed to complete the survey and are not representative of all Health Appraisal patients. Patients who did not speak English or who were confused or otherwise unable to comprehend the survey were not asked. Also, patients with less positive health outcomes or experience with the Kaiser process may not have agreed to participate. The method was the same, however, for both the CompuHx and non-CompuHx patients. Thus, this limitation should not bias the finding that the patients who completed the surveys were equally satisfied.

DISCUSSION

This study appears to be the first research conducted in the United States on patient reactions to computers in the examining room. The survey was based on the patient satisfaction literature and included reliable scales measuring patients' overall satisfaction with their experience; cognitive, affective, behavioral, and advice scales; and specific items concerning the clinician's focus on the chart or computer and whether the clinician seemed rushed during the exam. Findings showed no difference in patient satisfaction between CompuHx and non-CompuHx groups with any aspect of their Health Appraisal experience.

The finding that computers in the examining room did not result in lower affective and cognitive patient satisfaction scores indicates that clinician use of a computer during consultation did not depersonalize the encounter for the patients. The fact that scores on the behavior scale (measuring perceptions of the thoroughness of the exam and confidence in the examiner) also showed no differences indicates, however, that computer use by the clinician also did not enhance patient satisfaction with their experience. Although CompuHx patients agreed that they would choose an examiner who used a computer, their scores on this item were considerably lower than their highly positive ratings on the other scales. Clearly, the computer was less important to patients than the other aspects of their relationship with the clinician, with which they were highly satisfied.

Table 2
Comparison of Patient Satisfaction with Exams Conducted with and without CompuHx

Dimensions of Patient Satisfaction	Total Sample		Examinations With CompuHx		Examinations Without CompuHx	
	Mean	SD	Mean	SD	Mean	SD
	(*n*=427)		(*n*=233)		(*n*=194)	
Global Satisfaction with Health Appraisal Scale	4.43	0.77	4.43	0.73	4.43	0.81
Cognitive Scale	4.56	0.77	4.52	0.76	4.60	0.79
Affective Scale	4.55	0.79	4.51	0.76	4.60	0.81
Behavior Scale	4.54	0.84	4.51	0.82	4.59	0.88
Acceptance of Advice Scale	4.39	0.75	4.32	0.77	4.47	0.73
Examiner focused on chart/computer (1 item)	3.63	1.39	3.69	1.30	3.57	1.49
Examiner seemed rushed (1 item)	1.81	1.26	1.76	1.17	1.87	1.38

Scale scores: 1=strongly disagree, 3=neutral, 5=strongly agree.

Table 3
Scales Showing Differences by Patient Gender

Dimensions of Patient Satisfaction	Total Sample		Examinations With CompuHx		Examinations Without CompuHx	
	Male	Female	Male	Female	Male	Female
	(n=221)	(n=203)	(n=139)	(n=91)	(n=82)	(n=112)
Behavior Scale	(n=174)	(n=152)	(n=119)	(n=62)	(n=55)	(n=90)
Mean	4.46	4.64	4.42	4.68	4.54	4.62
SD	0.88	0.79	0.88	0.65	0.89	0.88
	$p<.05$ (t=-2.02, df=323.8)		$p<.02$ (t=-2.30, df=159)		not significant	
Acceptance of Advice	(n=160)	(n=144)	(n=105)	(n=58)	(n=55)	(n=86)
Mean	4.29	4.51	4.24	4.48	4.38	4.52
SD	0.78	0.71	0.80	0.69	0.76	0.72
	$p<.02$ (t=-2.54, df=302)		$p=.05$ (t=-1.96, df=132.4)		not significant	
Examiner Seemed Rushed	(n=170)	(n=153)	(n=115)	(n=64)	(n=55)	(n=89)
Mean	1.85	1.76	1.90	1.50	1.75	1.94
SD	1.17	1.36	1.18	1.11	1.17	1.49
	not significant		$p<.05$ (t=2.28, df=136.6)		not significant	

Scale scores: 1=strongly disagree, 3=neutral, 5=strongly agree.

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