Computer Use and Needs of Internists: A Survey of Members of the American College of Physicians–American Society of Internal Medicine

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The American College of Physicians–American Society of Internal Medicine conducted a membership survey in late 1998 to assess their activities, needs, and attitudes. A total of 9,466 members (20.9% response rate) reported on 198 items related to computer use and needs of internists. Eighty-two percent of the respondents reported that they use computers for personal or professional reasons. Physicians younger than 50 years old who had full- or part-time academic affiliation reported using computers more frequently for medical applications. About two thirds of respondents who had access to computers connected to the Internet at least weekly, with most using the Internet from home for e-mail and nonmedical uses. Physicians expressed concerns about Internet security, confidentiality, and accuracy, and the lack of time to browse the Internet. In practice settings, internists used computers for administrative and financial functions. Less than 19% of respondents had partial or complete electronic clinical functions in their offices. Less than 7% of respondents exchanged e-mail with their patients on a weekly or daily basis. Also, less than 15% of respondents used computers for continuing medical education (CME). Respondents reported they wanted to increase their general computer skills and enhance their knowledge of computer-based information sources for patient care, electronic medical record systems, computer-based CME, and telemedicine While most respondents used computers and connected to the Internet, few physicians utilized computers for clinical management. Medical organizations face the challenge of increasing physician use of clinical systems and electronic CME.

INTRODUCTION

Most health care organizations are trying to assess the computer use and needs of physicians. Surveys of physicians have been conducted to gauge their computer use [1-5]. The American College of Physicians–American Society of Internal Medicine (ACP-ASIM) surveyed its membership in order to identify characteristics and environmental circumstances that influence internists' activities, needs, and attitudes toward health care issues. The findings reported here on the computer use and needs of internists are based on the 1998 ACP-ASIM member survey.

MATERIALS AND METHODS

The ACP-ASIM mailed surveys to its membership between June 1998 and October 1998. Ten versions of the survey were created to minimize the number of items per respondent and maximize the number of items across different content segments. The segments included demographic information, practice characteristics and issues, general technology, professional technology, meetings and educational products, and membership issues. All active members of ACP-ASIM with valid United States addresses were sent surveys. A total of 71,363 surveys were mailed, with 15,375 members responding to the survey, for a total response rate of 21.6%. Survey versions containing items related to computer use and needs were sent to 45,206 members, with 9,466 members responding, for a response rate of 20.9%. The overall sample (respondents) was fairly similar (within 5%) to the population (mailed surveys) in terms of age, gender, and primary specialty. Of 579 items in the entire survey, 198 questions were related to computer use and needs of internists. All survey items were close-ended and self-reported. Many survey items contained Likert-type formats (usually 5-point scales) or dichotomous yes/no responses. Each respondent's demographic data, purchasing data, and use of educational programs were obtained from other ACP-ASIM databases.

Statistical analysis of the data included one-way frequency analysis and univariate descriptive statistics using SAS software [6]. Questions with Likert-type scales were summarized using an average and a semi-interquartile range (SIR), which is defined as (75^{th} percentile – 25^{th} percentile)/2. In addition, decision tree analysis using the SPSS Chi-squared Automatic Interaction Detector (CHAID) method and Exhaustive CHAID method [7] was performed on 46 selected items to identify important predictive demographic variables, including age, gender,

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academic affiliation, practice size, membership category, and subspecialty.

The survey was used to identify membership medical informatics needs using two methods. The first method selected survey items that represented reported needs with an average greater than 3.75 or less than 2.25 on a 5-point Likert scale (1 to 5), or greater than 75% or less than 25% for yes/no responses. The scales were standardized for interpretation and comparison. Sixty-eight of 198 items (34%) were selected by this method. The second method selected items identified by physicians as desirable or important with a scale rating above 3.0 on a 5-point Likert scale. Twenty-three of 198 items (12%) were identified by this method, six of which were duplicate items identified by the first method.

Some limitations should be considered when interpreting the data. First, respondents were not exactly similar to the entire membership (population) with respect to some demographic characteristics. In addition, the survey response rate was low (20.9%). Hence, the survey respondents may show a "self-selection" bias in that they are likely to represent more supportive and interested ACP-ASIM members than non-respondents. This probably resulted in an overestimation of computer use by respondents compared with non-respondents.

RESULTS

Computer Use by Internists

The ACP-ASIM survey revealed that 82% of internists use computers for personal or professional reasons. Eighty-one percent of physicians had the technology to connect to the Internet from home and 65% from the office. The median computer experience for physicians was 5 years at home and 3 years at the office. Decision tree analysis revealed that physicians younger than 50 years old use computers much more frequently. Also, physicians with full- or part-time academic affiliations used computers more often for medical applications. Furthermore, male physicians tended to use computers more frequently than female physicians.

In the professional setting, physicians utilized computers to help them administratively manage their practice. Physicians reported computer functionality (5-point scale, with 1=not at all and 5=completely) for insurance/managed care billing (average, 4.36; SIR, 0.5), office accounting/finances (average, 4.13; SIR, 1.5), and appointments (average, 3.71; SIR, 2). In the office setting, physicians were less likely to have computers with the functionality to clinically manage their patients. For example, physicians reported that computers in their office had functionality to access information to manage patient medical histories (25%), for reminders and alerts (16%), and to find information on clinical practice guidelines (9%). When with a patient, physicians rarely consulted a non-Internet computer-based information source (6%) or a Web-based information source (4%). In the hospital setting, physicians had functionality to access laboratory test results (76%) and online storage of radiographs (21%). Also, in hospitals, physicians reported low functionality of computers to access information on patient medical histories (25%), for reminders and alerts (14%), and to find information on clinical practice guidelines (12%).

Physicians sometimes used computers in their home for patient management. For example, 28% of physicians used a computer for inpatient care management and 27% of physicians for outpatient care from the home on at least a weekly basis. Physicians reported using the computer for e-mail in the office (58% daily), but exchanged e-mail with colleagues (21%) or patients (7% weekly or daily) less often.

The Internet was used by the majority of respondents. Sixty-seven percent of physicians with the technology to connect to the Internet at home used the Internet on a weekly or daily basis, and 69% of physicians used the Internet at the office. At home, physicians used computers for personal e-mail (69% daily or weekly) and to seek nonmedical information (62% daily or weekly). They also used computers at home occasionally to seek medical information. For example, 27% of respondents used computers for database literature searches on a weekly or daily basis. However, only 2.6% of physicians used computers for exchanging e-mail with patients on a weekly or daily basis at home, and only 1.8% of physicians reported using computers to earn CME credit on a weekly or daily basis.

Physicians rated themselves as average in terms of using the Internet for purposes other than e-mail (average, 2.77; SIR, 1.5 [scale: 1=not at all skilled and 5=very skilled]). Physicians indicated that the Internet was problematic (5-point scale, with 1=not at all problematic and 5=very problematic) in the lack of time to use the Internet (average, 3.60; SIR, 1). In addition, they were concerned about the accuracy of information (average, 3.29; SIR, 1) and assuring the security and confidentiality of information (average, 3.15; SIR, 1). Physicians were neutral regarding

knowing what was on the Internet (average, 2.91; SIR, 1).

Needs Analysis

Based on the survey's results, the following members' general medical informatics needs were identified:

- Enhance general computer skills
- Increase knowledge of computer-based information sources for patient care
- Increase knowledge of electronic medical record (EMR) and office-based and hospital-based management systems
- Increase use of computer-based continuing medical education
- Increase use of telecommunications and telemedicine
- Address Internet issues of security, confidentiality, and accuracy

Respondents believed it was very important to develop computer skills (average, 4.21; SIR, 0.5 on a 5-point scale, with 1=not at all important and 5=very important). However, physicians were less satisfied with their current computer skills (average, 2.62; SIR, 1 on a 5-point scale, with 1=not at all satisfied and 5=very satisfied). Physicians rated their own computer skills as average (average, 4.01; SIR, 2 on a 7-point scale, with 1=below average, 4=average, and 7=above average). Physicians believe computers increase their efficiency and effectiveness (average, 3.28; SIR, 1.5 on a 5-point scale, with 1=not at all and 5=very much).

In general, respondents felt computers are useful tools for finding medical information (average, 3.45; SIR, 1.5 [1=not at all useful; 5=very useful]). Sixty-nine percent of respondents reported occasional use of computers to find medical information. Physicians wanted electronic versions of abstracts of journal articles (average, 3.38; SIR, 1.5), full text of journal articles (average, 3.27; SIR, 1.5), and complete journals (average, 3.05; SIR, 1 [1=not at all useful; 5=very useful]). However, only 19% of physicians consulted an Internet-based information source for clinical decision-making for individual patient care on a weekly or daily basis. Internists reported the desirability of receiving guidelines in electronic format for clinical issues (average, 3.50; SIR, 1 [1=not at all desirable; 5=very desirable]). Yet, physicians reported that clinical practice guidelines were available on only 12% of hospital computers and on only 9% of computers in their practice. In addition, only 17% of physicians used software (e.g., CD-ROM) on a computer as a source for clinical decision-making for individual patient care. Physicians rarely reported (12% more than occasionally) using Internet-based information sources for clinical decision-making when with a patient. In addition, internists rarely used the Internet for medical news groups or online discussion groups.

Physicians reported using computers for managing their medical practice. Sixty-five percent of respondents reported using computers in the office for management of nonclinical work on a weekly or daily basis. Physicians felt that the EMR is useful (average, 3.63; SIR, 1 [1=not at all useful; 5=very useful]). However, only 19% of physicians reported that their office was partially or completely computerized for patient records. Internists reported functionality of computers in their practice to access patient medical history (19%), for reminders and alerts (16%), ordering diagnostic tests (13%), documentation of patient care (12%), ordering medication and therapeutics (10%), and image storage for radiographs (6%).

Internists were neutral about the usefulness of electronic versions of CME resources (average, 3.11; SIR, 1 [1=not at all useful; 5=very useful]). They rarely reported using computers in the office or home for CME credit on CD-ROM (less than 14%) or connecting to the Internet (less than 10%) on at least a monthly basis.

Internists frequently used the Internet at home for e-mail and non–e-mail purposes, but they used telecommunications (e-mail) less frequently in the professional setting. The extent to which offices are computerized for e-mail among staff was reported by 31% of physicians. In practice, physicians reported using computers to exchange information with colleagues (21%), from office computers to hospital computers (15%), or with other remote sites from office computers (12%). Less than 7% of internists connected to the Internet from the office to exchange e-mail with patients on a weekly or daily basis. Personal use of video terminals to provide health care services or consultations from a distance (telemedicine) was reported on at least a monthly basis by only 8% of physicians.

DISCUSSION

The ACP-ASIM membership survey revealed that the majority of physician respondents (82%) use computers. Most physicians connected to the Internet from home, but fewer from their offices. About two thirds of respondents connected to the Internet from home or the office on a daily or weekly basis.

Finding time to connect to the Internet was problematic, and concerns were expressed about the accuracy, security, and confidentiality of information on the Internet. Knowing what is available on the Internet is also important to members. Physicians younger than 50 years old reported greater use of computers, especially if they had academic affiliations.

In the future, with the introduction of very fast wired (cable and telephone) and wireless communication, there may be greater integration of these services and information sources into the clinical workflow [8]. If so, more physicians will use the Internet from their home and office on a more regular basis. Finding time to use the Internet will continue to be problematic for the busy physician, but the security and confidentiality of information on the Internet are currently being addressed with Federal regulations. Assuring the accuracy of information on the Internet and informing physicians about medical Web sources will be an opportunity and a challenge for medical organizations.

The survey revealed that physicians used computers in professional settings, especially in the office, for administrative functions of billing, accounting, and scheduling appointments. Fewer than 25% of physicians reported using computer applications for clinical management of patients, and the frequency of such use was low. Physician respondents rarely used computers at the point of care for medical information on a regular basis. Perhaps there is an unwillingness of physicians to sacrifice any more of their precious but limited time allotted for face-to-face patient contact. At home, the majority of physicians reported using computers for personal e-mail on a regular basis. They use computers to seek nonmedical information, but rarely use computers for CME.

In the future, most physicians will continue to use computers in the office for administrative functions. With increasing use of EMR systems and more monitoring of physician performance, there may be incentive to use computers to manage patients in the professional setting. At home, physicians will continue to use personal e-mail and seek nonmedical information. It will be a challenge for medical organizations to develop electronic CME programs that will interest physicians contending with other competing demands at home and in the office.

Physicians rated their own computer skills as average and were not satisfied with their computer expertise. Physicians believe that it is very important to develop their computer skills to increase their efficiency and effectiveness in the future. This represents a great opportunity for medical organizations to help physicians increase their computer knowledge through a variety of learning formats. Physicians continue to want the delivery of new medical knowledge by printed material and CD-ROM products. Although the computer industry believes that very fast Internet connections will replace the CD-ROM as a means of delivering information, printed materials will still be important to physicians. In addition to traditional printed books and journals, physicians will increasingly print materials from electronic sources.

Physicians wanted to increase their computer skills and use information technologies to enhance their clinical practice. Physicians reported a desire to learn about current general computer applications, new uses of telemedicine, including e-mail with colleagues, staff, and patients, and general Internet issues. Physicians also reported a need to increase their knowledge of computer-based information sources of patient care through use of EMR systems, electronic medical books and journals, electronic clinical guidelines, and electronic sources of CME.

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