Information-seeking behavior of medical residents in clinical practice in Bahia, Brazil*

Martha Silvia Martinez-Silveira, MLS; Nanci Oddone, PhD

See end of article for author's affiliations.

DOI: 10.3163/1536-5050.96.4.016

INTRODUCTION

In the last twenty years, several researchers around the world have explored issues related to information and clinical practice [1–6] and the role of the librarian in this context [7–11]. Several studies have focused specifically on residents' information needs and behavior [12–16]. This body of research indicates that preceptors serve as preferred information sources for many residents [12, 15], rather than textbooks or other resources [1, 17–19]. Additional studies have illustrated that residents may encounter a number of questions in clinical practice [15, 16], most frequently relating to topics such as therapy or diagnosis [13, 15, 20]. However, clinical questions are not often pursued by residents [12, 15]. Among pursued questions, the answers to these questions have been shown to change the management of the patient in up to 70% of the cases [15]. Common obstacles in the information-seeking process identified by residents include lack of time, doubt about the existence of relevant information, retrieval of too much information, and difficulties with navigation and searching [6, 14–16]. Few studies have focused specifically on health professionals' information needs in Brazil [19, 21–23], and none of these included residents.

Residency training in Brazil

Medical residency in Brazil is a graduate-level course of study, a specialization characterized by training in the clinical environment under medical professionals' supervision [24, 25] and limited by law to sixty hours per week. An individual residency may last two or three years; some specialties (e.g., cardiology, plastic surgery, angiology) require a second residency in either general medicine or general surgery [26], thus requiring a total of five to six years to complete.

Residents at the Professor Edgar Santos University Hospital (HUPES) of the Federal University of Bahia Medical College (UFBA-FAMEB) in Salvador, the capital city of the Brazilian state of Bahia, have direct access to several important resources including the HUPES Library, the UFBA-FAMEB Library, freely accessible regional and international electronic databases, and the Capes Portal <www.periodicos.capes.gov.br>, a powerful information tool providing access to several databases and more than ten thousand full-text scientific journals.

To explore the information needs and behavior of housestaff at this institution, the researchers surveyed a group of residents from October 2004 through December 2004. The team hypothesized that (a) consultation of scientific information constituted a crucial element of patient care; (b) residents were familiar with available information resources; and (c) they were able to handle these resources efficiently. This survey also aimed to identify the role of health sciences libraries and resources available in Brazil in meeting physicians' information needs for clinical practice.

METHODS

Sample

In 2004, 120 residents were enrolled at HUPES in 23 different specialties. For the survey, all residents in the third year of residency were selected due to the small size of the group (n=17) relative to those in other years of residency. For each third-year resident, 2 residents in the first year and 2 in the second year were randomly selected from a list of residents, resulting in a final pool of 85 residents.

Survey techniques

The authors employed a survey [27] with a critical incident component [28] to explore residents' reported information needs and behavior.

Questionnaire design

Investigators developed a six-part questionnaire with thirty-five questions (Appendix online) exploring: (1) demographic data, (2) respondents' behavior when faced with a clinical information need, (3) habits and preferences for information resources management, (4) information-related skills, (5) most frequent information needs, and (6) examination of a particular situation in which the resident needed information to support clinical care.

* Based on a presentation at IX ICML, the Ninth World Congress on Health Information and Libraries; Salvador, Bahia, Brazil; 20–23 September 2005.

Supplemental Tables 1, 2, 3, 4, and 5; Figure 1; and an appendix are available with the online version of this journal.

Pilot testing and survey distribution

A pilot version of the questionnaire was administered to ten senior medical students. Eight copies with answers were returned. Results of this pilot-testing revealed the need to reformulate some of the questions to clarify their intention. The instrument was refined to reflect these observations.

Printed copies of the final questionnaire were distributed to residents in person by the researchers with a deadline for completing the questionnaire. Two reminders were sent to residents who had not yet completed the survey. Whenever possible, the resident completed the questionnaire at the time of initial delivery.

Analysis

SPSS version 12 was used for all analyses. Differences between groups were analyzed using Fisher's exact test. For ordinal variables and continuous quantitative variables, respectively, the Mann-Whitney U test and Student *t* test were used.

RESULTS

Analysis of the 73 returned questionnaires (86% response rate) showed that respondents' ages ranged from 23 to 43 years (mean 27.6+/−3.2 SD); 39 were male (53%); and 39 were in their first year of a given residency (53%), while 24 (33%) were in their second year and 10 (14%) in their third year. Almost half of the sample (n=33, 45%) consisted of doctors pursuing their first residency, and the same number were in their second residency. Seven residents (10%) did not respond to this question.

Residents reported that they cared for an average of 13.5+/−6.3 SD patients a day in an average of 7.5 (SD 2.8) daily work hours. Four residents were not carrying out patient care activities, and 2 did not answer the question.

Information needs

All respondents noted information needs in the previous 30 days. The most frequent categories of these needs included drug therapy (n=32, 44%) and diagnosis (n=21, 29%). The most frequently used information sources during this period are shown in Table 1 (online). Concerning the motivations prompting residents to search for information in the past 30 days, doubts (n=53, 71%) and rare medical cases (n=52, 71%) were the most frequently noted (Table 2 online). Barriers encountered during searches for information are described in Table 2 (online).

Thirty residents (41%) reported frequently visiting a medical library, 18 (25%) rarely visited, and 24 (33%) never visited; 1 resident did not answer this question. Respondents in their first residency reported frequent visits to the library (18/33, 55%) more often than those in their second residency (8/33, 24%) (Students *t* test $P=0.03$). In the overall group, those who never or rarely visited a library (42/73, 58%) indicated that collections were outdated (27/73, 26%); documents that they needed were not available (11/73, 26%); or libraries were not needed because of the Internet (11/73, 26%).

Preferred information sources are summarized in Table 3 (online). Individuals in their second residency preferred to consult their preceptors (11/33, 33%), while those in their first residency gave priority to consulting their private collections (17/33, 52%) (Mann-Whitney U $P=0.03$). The contents of residents' private collections are illustrated in Table 4 (online).

Among bibliographic resources, residents overwhelmingly preferred textbooks (n=56, 77%). Additional information resources are illustrated in Figure 1 (online).

Residents reported that having either books (n=62, 85%) or a computer with Internet access (n=58, 79%) available near the clinical floor was necessary to support good clinical practice. Many also indicated that an up-to-date collection in the hospital library was essential (n=49, 67%).

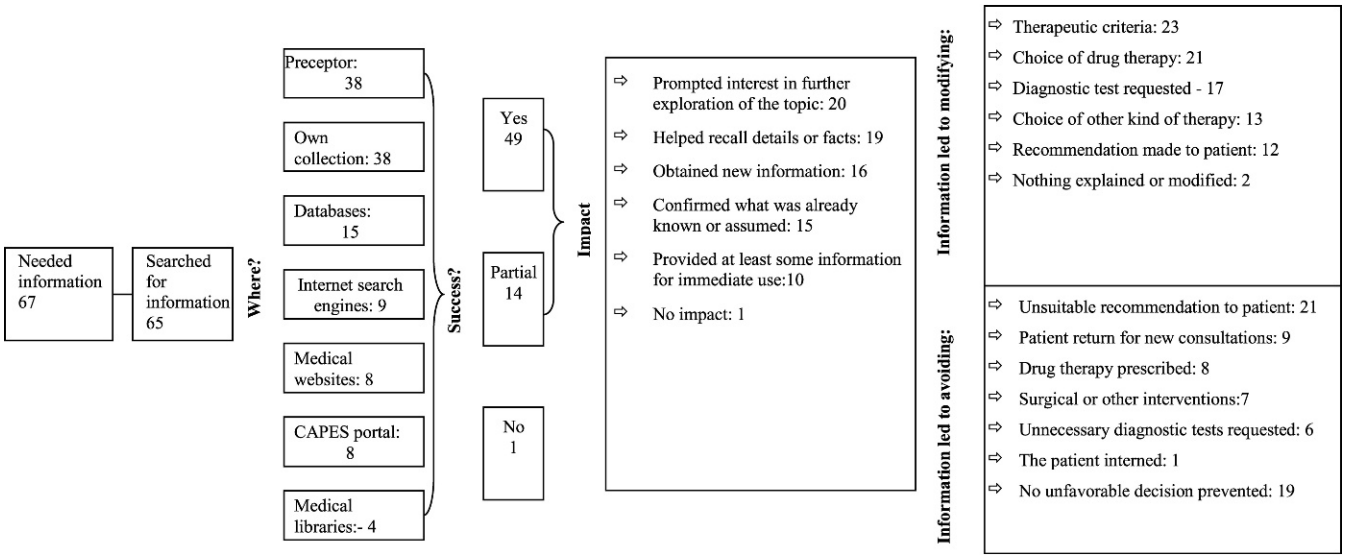
Knowledge and skills in management of bibliographic databases

Most residents reported performing their own database searches (n=66, 81%). Among those who did their own searches, MEDLINE was the best-known and most frequently used database (47/66, 71%): only 1 of 66 (2%) respondents did not know of MEDLINE. The Lilacs database, specializing in regional health literature, was used by 52% of residents (34/66). CINAHL, PsycINFO, and the Cochrane Library were used less frequently (43/66, 65%; 39/66, 59%; and 21/66, 32%, respectively).

Most HUPES residents had not received training in using databases: 48 (73%) of the 66 individuals who performed their own searches reported that they were self-taught and only 1 had been trained by a librarian. Regarding the searching process in databases, many respondents explained that they usually entered keywords in the first dialog box (25/66, 38%). Some reported using the ''advanced search'' option (15/66, 23%); few noted combining several keywords with Boolean operators (16/66, 24%) or using ''limits,'' ''fields,'' or ''index'' resources (5/66, 8%). Many reported that they were dissatisfied with their search results (45/66, 68%), and 23 of 66 (35%) indicated a need for learning more about search techniques (Table 5 online).

Several problems were identified in the information searching process. Many residents noted difficulties in choosing among the large number of documents retrieved in searches (35/66, 53%), and lack of time was also noted as a problem (25/66, 38%). When asked about criteria for selecting references, the most important factors were free full-text availability (49/66, 74%) and currency or novelty of the information (41/66, 62%). Regarding access to the full text, few residents said they visited a library to check document availability (12/66, 18%), ordered articles through a library (6/66, 9%), or used other online ordering systems (6/66, 9%). Approximately half of respondents preferred electronic tools for literature searching (35/66, 48%), yet most indicated they preferred to print the documents (61/66, 92%) rather than read them online (5/66, 8%).

Figure 1
Critical incident results



The numbers may be higher than totals, as respondents were allowed to choose more than one option for the question.

Critical incident results

Seventy-one residents (97%) answered the critical incident portion of the questionnaire, and 67 (92%) were able to recall a specific occasion in the previous month during which they needed scientific information for patient care. Among them, 2 declared not having pursued a search related to that information need. Those who verified an information need during their clinical practice reported that the associated clinical subject was diagnosis or diagnostic tests (26/67, 39%); drug therapy (19/67, 28%); other kinds of therapy (9/67, 13%); etiology or harm (5/67, 8%); and prognosis (3/67, 5%). Additional results obtained in the critical incident section of the questionnaire are shown in Figure 1.

DISCUSSION

In accordance with earlier studies [13, 15, 20], information needs reported by residents of HUPES often related to therapy, particularly drug therapy, or diagnosis. Previous research illustrated that physicians frequently consulted another doctor, generally a specialist or other colleague [12, 15]. In the present study, residents relied on preceptors to solve doubts, although books were also mentioned for filling information gaps. A preference for books as a source of information was almost unanimous in research with similar populations [2, 17–19], and, similar to the current results, these books were often part of a private collection. Research has also concluded that information sources (e.g., the library, electronic databases) were of fundamental importance in a clinical environment given their direct contribution to decision making in health issues, often making the difference in patient survival [20, 29–31]. Libraries, however, were not heavily used in the current study, visited by only 40% of residents and ranking sixth in preferred information sources, a trend echoed in other studies [19, 30–34].

Residents of HUPES affirmed a need to learn more about research techniques. This reported lack of skill in handling databases and other electronic resources has also been noted by others [6, 14, 15, 34, 35].

Due to its focus on a group of residents in Brazil, the present research may have limited generalizability to other settings; however, similarities between the current results (full data available in dissertation [36]) and resident information needs in other studies [12–16] point to commonality of challenges and preferences among residents, perhaps independent of geographic location. These observations reaffirm that important opportunities remain for librarians and libraries in both providing access to information resources and educating clinicians in how to efficiently and effectively utilize such tools.

ACKNOWLEDGMENTS

The authors gratefully acknowledge Pamela C. Sieving, AHIP, informationist, National Institute of Health Library, United States, and Mayank J. Trivedi, chief librarian of Pramukhswami Medical College, Gujarat-India, for their helpful and constructive comments on the manuscript.

REFERENCES

1. Covell DG, Uman GC, Manning PR. Information needs in office practice: are they being met? Ann Intern Med. 1985 Oct;103(4):596–9.
2. Osheroff JA, Forsythe DE, Buchanan BG, Bankowitz RA, Blumenfeld BH, Miller RA. Physicians' information needs:

analysis of questions posed during clinical teaching. Ann Intern Med. 1991 Apr 1;114(7):576–81.
3. Smith R. What clinical information do doctors need? BMJ. 1996 Oct 26;313(7064):1062–8.
4. Jerome RN, Giuse NB, Gish KW, Sathe NA, Dietrich MS. Information needs of clinical teams: analysis of questions received by the Clinical Informatics Consult Service. Bull Med Libr Assoc. 2001 Apr;89(2):177–84.
5. Gonzalez-Gonzalez AI, Dawes M, Sanchez-Mateos J, Riesgo-Fuertes R, Escortell-Mayor E, Sanz-Cuesta T, Hernandez-Fernandez T. Information needs and information-seeking behavior of primary care physicians. Ann Fam Med. 2007 Jul–Aug;5(4):345–52.
6. Hung PW, Johnson SB, Kaufman DR, Mendonça EA. A multi-level model of information seeking in the clinical domain. J Biomed Inform. 2008 Apr;41(2):357–70.
7. Schacher LF. Clinical librarianship: its value in medical care. Ann Intern Med. 2001 Apr 17;134(8):717–20.
8. Sargeant SJ, Harrison J. Clinical librarianship in the UK: temporary trend or permanent profession? part I: a review of the role of the clinical librarian. Health Info Libr J. 2004 Sep;21(3):173–81.
9. Wagner KC, Byrd GD. Evaluating the effectiveness of clinical medical librarian programs: a systematic review of the literature. J Med Libr Assoc. 2004 Jan;92(1):14–33.
10. Urquhart C, Turner J, Durbin J, Ryan J. Changes in information behavior in clinical teams after introduction of a clinical librarian service. J Med Libr Assoc. 2007 Jan;95(1):14–22.
11. Giuse NB, Koonce TY, Jerome RN, Cahall M, Sathe NA, Williams A. Evolution of a mature clinical informationist model. J Am Med Inform Assoc. 2005 May–Jun;12(3):249–55.
12. Ramos K, Linscheid R, Schafer S. Real-time information-seeking behavior of residency physicians. Fam Med. 2003 Apr;35(4):257–60.
13. Green ML, Ciampi MA, Ellis PJ. Residents' medical information needs in clinic: are they being met? Am J Med. 2000 Aug 15;109(3):218–23.
14. Phua J, Lim TK. Use of traditional versus electronic medical-information resources by residents and interns. Med Teach. 2007 May;29(4):400–2.
15. Schilling LM, Steiner JF, Lundahl K, Anderson RJ. Residents' patient-specific clinical questions: opportunities for evidence-based learning. Acad Med. 2005 Jan;80(1):51–6.
16. Green ML, Ruff TR. Why do residents fail to answer their clinical questions? a qualitative study of barriers to practicing evidence-based medicine. Acad Med. 2005 Feb;80(2):176–82.
17. Fernandez LA, Martin JM, del Castillo JD, Gaspar OS, Millan JI, Lozano MJ, Keenoy ED. Sources of influence on medical practice. J Epidemiol Community Health. 2000 Aug;54(8):623–30.
18. Haug JD. Physicians' preferences for information sources: a meta-analytic study. Bull Med Libr Assoc. 1997 Jul;85(3):223–32.
19. Mendes HMC, Meadows AJ. Personal information acquisition by health professionals in Brazilian and British hospitals: a comparative study. J Libr Inf Sci. 1997 Dec;29(4):189–93.
20. Ely JW, Osheroff JA, Chambliss ML, Ebell MH, Rosenbaum ME. Answering physicians' clinical questions: obstacles and potential solutions. J Am Med Inform Assoc. 2005 Mar–Apr;12(2):217–24.
21. Camargo KR. The thought style of physicians: strategies for keeping up with medical knowledge. Soc Stud Sci. 2002 Oct–Dec;32(5–6):827–55.
22. Curty MG. Busca de informação para desenvolvimento das atividades acadêmicas pelos médicos docentes da Universidade Estadual de Maringá [dissertation]. Campinas (SP): Fac Bibliot PUCCAMP; 1999.
23. Beraquet VSM, Cassanigra SE, Ciol R, Gonçalves SL, Rosa MV. Looking for new paths in educating health librarians in Brazil [Internet]. 8th European Conference of Medical and Health Libraries; Cologne, Germany; 16–21 Sep 2002 [rev. 5 May 2005; cited 17 May 2005]. <http://www.zbmed.de/eahil2002.html>.
24. Feuerwerker L. Mudanças na educação médica e residência médica no Brasil. Interf Com Saúde Educ. 1998 May;2(3):51–71.
25. Marcondes E, Gonçalves EL. Educação médica. São Paulo, SP: Sarvier; 1998.
26. Brasil. Ministério da Educação. Decreto no 80.281/77, de 5 de setembro de 1977. regulamenta a residência médica, cria a Comissão Nacional de Residência Médica e dá outras providências. Diário Oficial [da] República Federativa do Brasil. 6 Sep 1977;sec 1:11.787.
27. Babbie E. Métodos de pesquisa de survey. Belo Horizonte, Minas Gerais: Universidade Federal de Minas Gerais; 2005.
28. Flanagan JC. The critical incident technique. Psych Bull. 1954 Jul;51(4):327–58.
29. Bennett NL, Casebeer LL, Kristofco RE, Strasser SM. Physicians' Internet information-seeking behaviors. J Contin Educ Health Prof. 2004 Winter;24(1):31–8.
30. O'Connor P. Determining the impact of health library services on patient care: a review of the literature. Health Info Libr J. 2002 Mar;19(1):1–13.
31. Dee C, Blazek R. Information needs of the rural physician: a descriptive study. Bull Med Libr Assoc. 1993 Jul;81(3):259–64.
32. Stinson ER, Mueller DA. Survey of health professionals' information habits and needs. conducted through personal interviews. JAMA. 1980 Jan 11;243(2):140–3.
33. Tenopir C, King DW, Bush A. Medical faculty's use of print and electronic journals: changes over time and in comparison with scientists. J Med Libr Assoc. 2004 Apr;92(2):233–41.
34. Devitt N, Murphy J. A survey of the information management and technology training needs of doctors in an acute NHS trust in the United Kingdom. Health Info Libr J. 2004 Sep;21(3):164–72.
35. Lacher D, Nelson E, Bylsma W, Spena R. Computer use and needs of internists: a survey of members of the American College of Physicians-American Society of Internal Medicine. Proc AMIA Symp. 2000:453–6.
36. Martinez-Silveira MS. A informação científica na prática clinica: estudo do comportamento informacional do médico-residente [dissertation]. Salvador (BA): Universidade Federal da Bahia; 2005.

AUTHORS' AFFILIATIONS

Martha Silvia Martinez-Silveira, MLS (corresponding author)**,** marthas@bahia.fiocruz.br, Oswald Cruz Foundation (FIOCRUZ), Gonçalo Moniz Research Center (CPqGM); Inter-institutional Library Eurydice Pires de Sant'Anna, Waldemar Falcão, 121, Candeal, 40296-710 Salvador/Bahia, Brazil; **Nanci Oddone, PhD,** neoddone@uol.com.br, Head, Graduate Program in Information Science, Federal University of Bahia (UFBA), Information Science Institute (ICI), Basílio da Gama; s/n - Campus Universitário do Canela, 40110-100 Salvador/Bahia, Brazil

Received November 2007; accepted May 2008