

The role of subject knowledge in academic health sciences libraries: an online survey of librarians working in the United States^{1,2}

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Abstract: Introduction – Previous research suggests that Canadian academic health sciences librarians value knowledge of the health sciences and spend a considerable amount of time gaining and maintaining it. The current study replicates the earlier Canadian survey but employs a larger American sample to address three questions: Do academic health sciences librarians working in the United States find knowledge of the health sciences to be important, and if so, how do they acquire it? Do the attitudes of Canadian and American academic health sciences librarians differ with respect to subject knowledge? Methods – An invitation to participate in a Web-based survey was sent to 711 academic health sciences librarians working in the US; 154 participated. Results – Academic health sciences librarians in the US felt that keeping up with the scientific and medical literature was important to doing their jobs, although only 50% of respondents felt that a degree in the health sciences was somewhat or very useful. Discussion – Participating in professional organizations, visiting Web sites, and reading or browsing journals or magazines were rated by respondents as the best ways to become informed about the health sciences. Findings were similar to those of an earlier survey of Canadian academic health sciences librarians.

Introduction

Some librarians claim that little or no subject knowledge is required to work in science librarianship or indeed in any field of librarianship, arguing that is in large part librarians' knowledge of librarianship that determines their competence, rather than their knowledge of the disciplines they serve [1]. Others have claimed that the sciences are best served by those holding science degrees [2]. Still others feel that one may become a competent science librarian by educating oneself about the sciences [3]. While the need for subject knowledge in sciences and health sciences librarianship has been debated for some time, it has received renewed attention in the discussion of required competencies for health sciences liaison librarians.

Liaison librarians are librarians assigned to provide services (e.g., literature searching, reference assistance, instruction, collection development) to particular academic departments. A recent survey of clients of health sciences liaison librarians found that 89% felt it was "very important" or "somewhat important" that liaison librarians have a background in the discipline they serve [4].

Few studies, though, have been done to determine what importance academic health sciences librarians themselves place on subject knowledge. A 1990 study indicated that some academic health sciences librarians felt a need for subject knowledge, since several respondents stated that upon assuming their positions they had difficulty "getting accustomed to the nomenclature of medicine and grasping medical terminology" and some felt that this was "attributable to a lack of subject knowledge as their background knowledge was in totally different area [*sic*] such as humanities or social science" [5]. In 2004, a survey was conducted to determine whether academic health sciences librarians working in Canada felt subject knowledge was important, and if so, how they acquired and maintained it. While this survey seemed to indicate that Canadian academic health sciences librarians recognized the need for subject knowledge and devoted a considerable amount of time to maintaining and acquiring it, the sample size was small [6]. Were these findings representative of the attitudes and behaviours of academic health sciences librarians working across the United States as well? In the interests of comparison and confirmation, it was considered appropriate to conduct a similar survey of librarians working in the US.

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Methodology

In February 2006, an online survey of librarians working at 103 of the 122 libraries that serve US medical schools (identified by consulting the Web site of the Association of American Medical Schools) was undertaken. The survey instrument (Appendix A) was a brief questionnaire consisting

of 22 questions with write-in sections. Before being distributed, it was reviewed and approved by the University of Saskatchewan Behavioural Research Ethics Board. Prospective participants were identified by consulting the Web sites of their libraries. Some of the 19 libraries excluded from this study did not provide a staff listing or did not specify the role of their staff (i.e., librarian or paraprofessional). Two libraries were closed at the time of the survey mail-out, so their librarians were also excluded from the study. Once prospective participants had been identified, an e-mail was sent inviting them to complete an online survey, which was essentially the same as that sent to Canadian academic health sciences librarians in 2004, although references to French-language programs and organizations were removed, and the wording of a few questions was clarified. The survey was administered only in English and was completed on the Web, allowing respondents to remain anonymous. To comply with the University of Saskatchewan's ethics regulations, the author did not require respondents to answer all questions to submit the survey.

Results

Characteristics of respondents

Of 719 e-mail messages sent, eight were sent to invalid addresses. One hundred fifty-four of a possible 711 surveys were submitted, a response rate of 21.7%.

Of the 151 respondents who answered the question "How long have you worked in health sciences or science libraries?", 89 (58.9%) had worked more than 10 years in health sciences or science librarianship (Table 1). In this respect, the sample approximates the composition of the academic health sciences librarian workforce in North America, because the 2003–2004 edition of the *Annual Statistics of Medical School Libraries in the United States and Canada* indicated that 66.7% of medical school librarians in the two countries had worked for more than 10 years in the field [7].

Educational background

Of the respondents, 20 (13.0%) held a degree in the health sciences, defined here as the health professions (nursing, medicine, dentistry, pharmacy, etc.). When asked whether holding a degree in the health sciences was important to carrying out their job, 77 (50%) respondents felt it was very or somewhat important. There was no correlation between the number of years respondents had spent in the field and the importance they placed on holding a degree in the health sciences. Eleven (7.1%) respondents felt the subject degree was "very important". With one exception, these respondents held a degree in a health science or natural science (Table 2).

Several librarians working in the systems area commented that the bulk of their work was in the area of information technology, so subject knowledge was not important or much less important than for other librarians. This view is reflected in their responses to the question regarding the importance of a health sciences degree (Table 3).

Respondents indicated that many other areas of study were equally or more important than the health sciences. The areas of study mentioned by the largest number of respondents (Fig. 1) were the following: computer science and technology ($n = 37$); education ($n = 25$); management or administration

Table 1. Respondents' years of experience in science or health sciences libraries.

Years of experience	No. of responses
<2	10 (6.6)
2–5	34 (22.5)
6–10	18 (11.9)
11–15	25 (16.6)
>15	64 (42.4)

Note: Values in parentheses are the percentage of responses ($n = 151$).

($n = 21$); biology, chemistry or other basic sciences ($n = 20$); library and information science ($n = 19$); communication and writing ($n = 17$); statistics and research methods ($n = 14$); liberal arts and humanities (including history) ($n = 6$); accounting, marketing and other areas of business ($n = 6$); and the social sciences (including psychology) ($n = 6$). One respondent indicated that he or she perceived a trend towards hiring subject specialists without library and information science education and that he or she disagreed with this.

Currency

Keeping up with the scientific and medical literature was rated by 80% ($n = 120$) of respondents to be "somewhat important" (50.7%; $n = 76$) or "very important" (29.3%; $n = 44$). Only 2% ($n = 3$) of respondents felt that it was not at all important, while 18% ($n = 27$) felt it was not very important (Fig. 2). Librarians who had spent less time in the field were more likely to find currency important. The Spearman's rank correlation coefficient was 0.179 (which was significant at the 0.05 level), where a score of +1 would indicate that all those who spent less time in the field found currency more important, a score of -1 would indicate that all those with more experience in the field found currency more important, and a score of 0 would indicate no correlation between the two variables.

Hours per week devoted to continuing education

Respondents reported spending an average of 4.4 h per week on continuing education, defined here as participating in professional associations' activities, visiting Web sites, browsing journals or magazines, reading electronic discussion lists, taking university or community college courses, or watching or listening to television or radio programs. However, the amount of time spent varied widely; the standard deviation was an extremely large 4.5, and reported values ranged from 0–30 h per week. There was no correlation between the number of hours spent per week and the number of years spent working in the health sciences. Those with cataloguing responsibilities spent the least amount of time on continuing education, but because the standard deviation was so large for each group, the differences between the respondents holding different responsibilities were not significant (Table 4).

Ways to become informed

Visiting Web sites, reading or browsing journals or magazines, and participating in professional organizations were rated by the largest numbers of respondents as the best ways to "gain or maintain knowledge of the health sciences".

Table 2. Number of responses to the question “How important do you feel it is that your position be filled by someone who has a degree in a health sciences field (nursing, medicine, dentistry, pharmacy, physiotherapy, etc.)?” by respondent’s degree.

Degree held	Very important	Somewhat important	Not very important	Not at all important
All respondents (<i>n</i> = 154)	11	66	53	24
Health sciences (<i>n</i> = 20)	7	9	2	2
Biological sciences (<i>n</i> = 28)	3	13	10	2
Other sciences (<i>n</i> = 9)	0	7	2	0
Language and literature (<i>n</i> = 43)	1	14	18	10
History (<i>n</i> = 23)	0	13	8	2
Other humanities (<i>n</i> = 11)	0	8	2	1
Psychology (<i>n</i> = 10)	0	4	5	1
Other social sciences (<i>n</i> = 20)	0	6	10	4
Kinesiology (<i>n</i> = 2)	0	2	0	0
Business (<i>n</i> = 4)	1	1	1	1
Education (<i>n</i> = 18)	0	8	7	3
Fine arts (<i>n</i> = 7)	0	5	2	0
Other (<i>n</i> = 9)	0	2	3	4

Note: Many respondents had degrees in more than one area; therefore, their response was noted for each degree.

Table 3. Number of responses to the question “How important do you feel it is that your position be filled by someone who has a degree in a health sciences field (nursing, medicine, dentistry, pharmacy, physiotherapy, etc.)?” by primary responsibility of the respondent.

Area of responsibility	Very important	Somewhat important	Not very important	Not at all important
Administration	4	22	12	8
Cataloguing	0	4	4	0
Collection development	4	17	16	4
Interlibrary loan	1	6	4	1
Reference	7	44	30	13
Systems/information technology	0	8	9	6
User education	4	38	27	11
Other	2	14	11	7

Note: Many respondents had more than one primary responsibility, thus their responses are listed for each responsibility.

These methods were rated as “very useful” or “somewhat useful” by the largest number of respondents—96% (*n* = 138), 91% (*n* = 130), and 90% (*n* = 127), respectively. Figure 3 shows the number of respondents rating each method as “very useful”. There was no correlation between the number of years of service and the ranking of any of the methods, nor did preferred method vary according to primary responsibility of the respondent.

Professional organizations

Forty percent of respondents (*n* = 56) indicated that professional associations were a “very useful” method to gain or maintain knowledge of the health sciences. Most respondents (89.2%; *n* = 132) were members of the Medical Library Association. Other national associations mentioned by respondents were the American Library Association (and various sections thereof, including the Association of College and Research Libraries, Reference and User Services Association, etc.) (6.1%; *n* = 9), the Association of Aca-

dem Health Sciences Libraries (4.7%; *n* = 7), and the American Medical Informatics Association (4.1%; *n* = 6). Three respondents (2.0%) indicated they were members of the Special Library Association’s pharmaceutical and health technology division. Many respondents were members of local health library associations, especially chapters of the Medical Library Association.

Web sites

Thirty-nine percent (*n* = 56) of respondents indicated that they found Web sites very useful in gaining or maintaining knowledge of the health sciences. Respondents were asked to list the sites they visited on a weekly or more frequent basis; 96 did so. By far the most-mentioned Web site was MedlinePlus, listed by 11.7% (*n* = 18) of respondents. News sites such as *The New York Times* science or health sections and CNN were mentioned by several respondents, as were the Centers for Disease Control site, PubMed/Medline, and Google. Respondents were asked to provide names of sites

Fig. 1. Number of respondents rating various areas of study as of equal or greater importance to the health sciences.

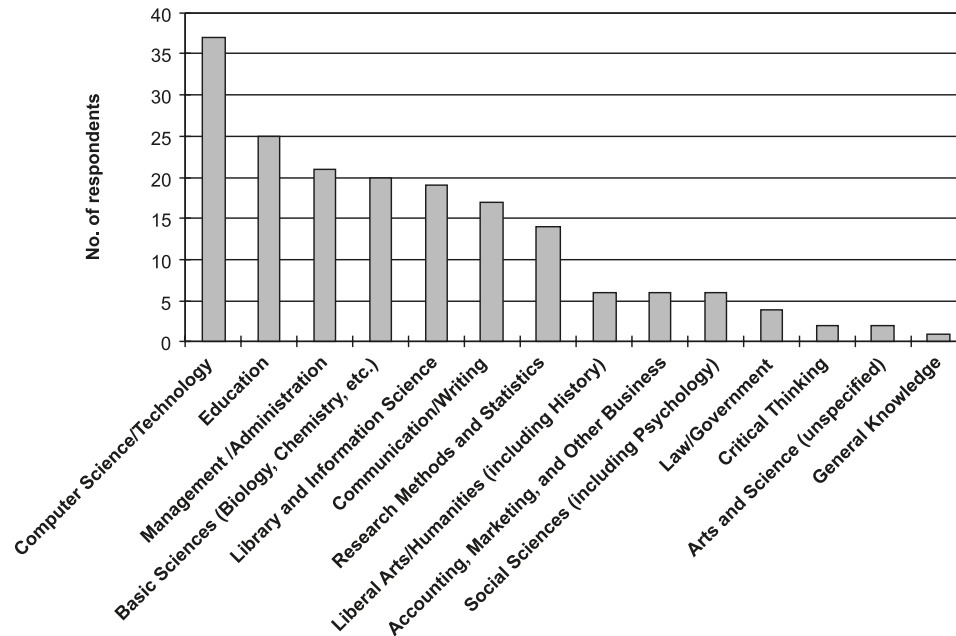
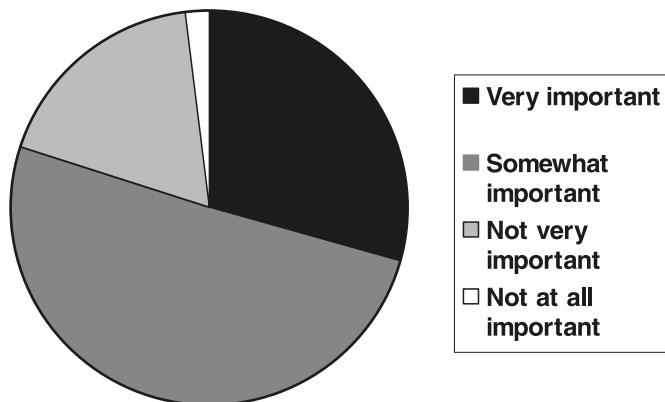


Fig. 2. Perceived importance of keeping up with the scientific and medical literature.



that they visited for their “own education, i.e., not to answer a reference question”. This question was perhaps not completely understood by respondents, since a few stated that they found answering reference questions to be educational. The intention behind the question, however, was to discover which sites respondents used for their own personal learning about the health sciences, not which sites they found most useful for answering reference questions, even if respondents found the process of answering reference questions to be educational.

Journals and magazines

Browsing or reading journals or magazines was rated by 39% ($n = 56$) of respondents as a “very useful” way to gain or maintain knowledge of the health sciences. The journals read or browsed once or more per month by the greatest numbers of respondents were the *Journal of the American Medical Association* (48%; $n = 71$) and the *New England*

Journal of Medicine (45.3%; $n = 67$) (Fig. 4). *Science* (26.4%; $n = 39$), *BMJ* (25.7%; $n = 38$), and *Nature* (21.6%; $n = 32$), were read by far fewer respondents.

Magazines that popularize science were read by some respondents but not by nearly as many as were the scientific journals. *Science News* was read by 11.5% ($n = 17$), *New Scientist* by 8.8% ($n = 13$), *Discover* by 8.1% ($n = 11$), and *Popular Science* by 4.4% ($n = 6$).

Respondents were given the opportunity to write in titles that they read on a regular basis (i.e., once every month for weekly publications and once every 3 months for monthlies). *Academic Medicine* was the most-read write-in title; it was listed by 6.5% ($n = 10$) of respondents. *Scientific American* was written in by 3.9% ($n = 6$) of respondents.

Several respondents indicated that they used RSS feeds, table of contents alerting, or keyword alerting services to find out about new journal articles and that they no longer necessarily browsed or read the complete journal in either physical or online form. Some continued to find browsing helpful; however, one respondent indicated that he or she regularly browsed all of the titles (numbering over 300) received by his or her library.

Discussion lists

Twenty-eight percent ($n = 39$) of respondents found electronic discussion lists to be very useful. MEDLIB-L was the most popular; 45.9% ($n = 68$) of respondents indicated that they subscribed. Respondents were asked to list other lists to which they subscribed. MEDREF-L, a health sciences reference list, was listed by 4.5% ($n = 7$) of respondents. Various Medical Library Association chapter and section lists were also listed by respondents.

Independent study

Twenty-eight percent ($n = 37$) of respondents found “independent study”, that is, studying without being enrolled in a course, to be “very useful”.

Table 4. Continuing education hours by area of primary responsibility.

	No. of respondents	Minimum	Maximum	Mean	Standard deviation
Administration	43	0	20	4.7907	4.45912
Cataloguing	7	1	10	2.8571	3.18479
Collection development	38	1	30	5.1776	6.04234
Interlibrary loan	10	0.5	12	3.3000	3.34332
Reference	91	0	30	4.2582	4.39024
Systems	20	0	15	2.9625	3.62400
User education	77	0	30	4.7143	4.88447
Other	30	0.25	20	4.8750	5.26404

Fig. 3. Percentage of respondents rating various methods of continuing education as “very useful”.

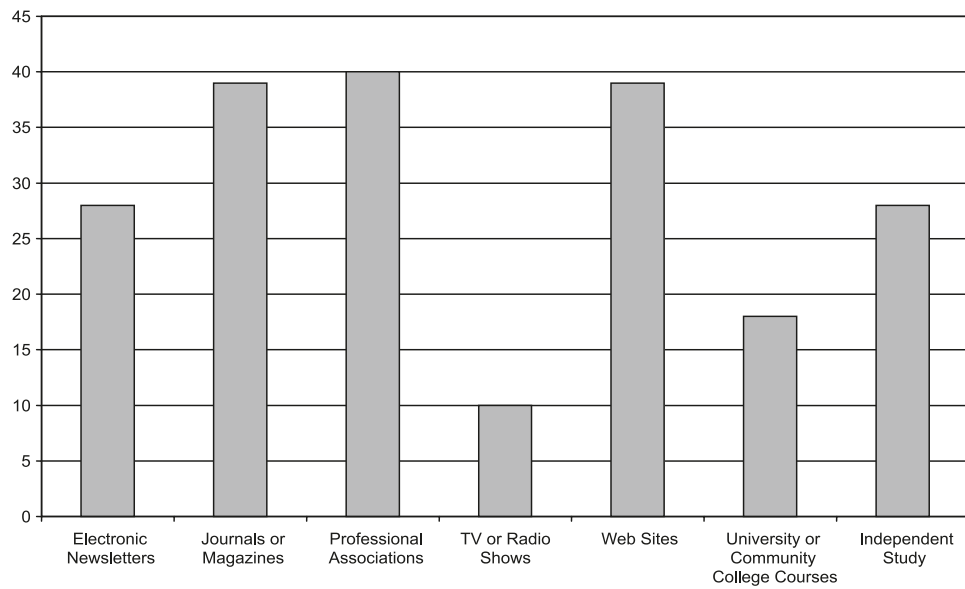
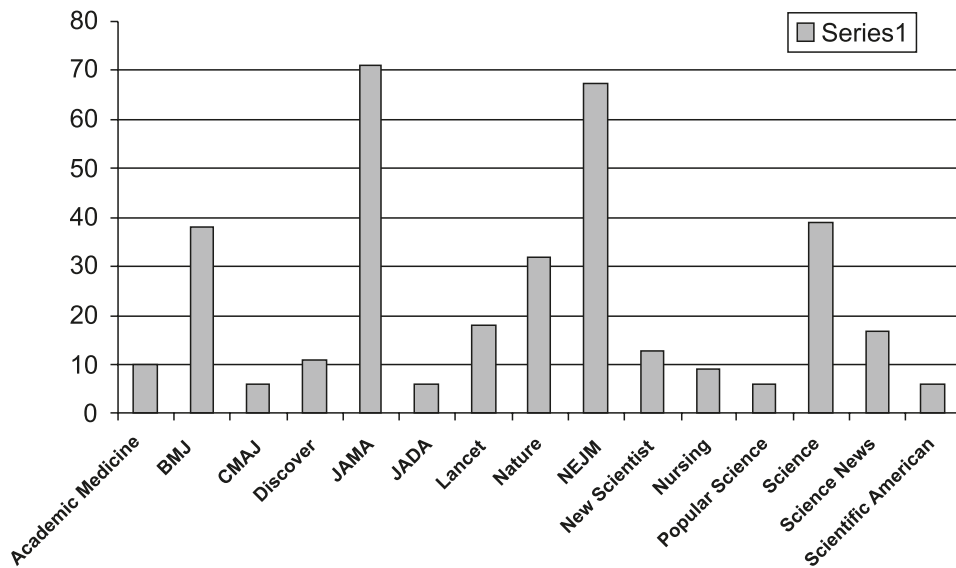


Fig. 4. Magazines and journals read by more than 5 respondents. Weekly journals or magazines were read at least once a month; monthly journals or magazines were read at least every 3 months. CMAJ, *Canadian Medical Association Journal*; JAMA, *Journal of the American Medical Association*; JADA, *Journal of the American Dental Association*; NEJM, *New England Journal of Medicine*.



University or community college courses

Few respondents (3.2%; $n = 5$) were taking a course at the time of the survey. Epidemiology and public health, medical informatics, and health communications were the areas of study. A few respondents also indicated that they had taken courses in medical terminology and the basic sciences in the past. Eighteen percent ($n = 21$) of respondents felt that taking courses was "very useful". Interestingly, this was the method that was rated by far by the greatest number of respondents (26%; $n = 31$) as "not at all useful".

Television and radio programs

Ten percent of respondents ($n = 14$) felt watching television or listening to radio programs on science topics was "very useful". *Nova*, which appears on the Public Broadcasting Service (PBS), was the most popular show; 36.7% ($n = 53$) of respondents watched this show at least once a month. National Public Radio shows were mentioned by many respondents (17.5%; $n = 27$); among these, *Science Friday* was the most popular. PBS shows other than *Nova* were also listed by a large number of respondents as were shows on the Discovery channel.

Other activities

Some respondents listed other methods that they used to gain or maintain knowledge of the health sciences. The method most often listed by these respondents was attending lectures, workshops, rounds, or conferences. Some of the respondents indicated that these events were aimed at health practitioners rather than librarians. Other methods listed were answering reference questions, reading blogs and (or) RSS feeds, talking to patrons, following the news, participating in journal clubs, taking online courses, and watching webcasts.

Membership in the Academy of Health Information Professionals

Because the Medical Library Association's professional development program, the Academy of Health Information Professionals (AHIP), requires continuing education of its members, the author was interested in finding out what percentage of respondents took part in AHIP. Only 37.5% ($n = 57$) of respondents indicated that they were AHIP members. This is similar to the figure (34.8%) cited by Baker et al. in their survey of Midwest librarians [8].

Discussion

Subject knowledge is important to academic health librarians in the US. However, only 50% ($n = 77$) of respondents felt a subject degree was "very" or "somewhat" important to doing their job. There are several possible explanations for this finding. Some respondents indicated that they felt that their training in librarianship gave them the skills they needed to work in any area. Others acknowledged the usefulness of subject knowledge and knowledge of the terminology but felt that this could be acquired through methods other than formal degree studies. Still others felt subject knowledge was useful but not necessary. Also, as mentioned previously, some respondents held positions in areas such as systems, in which knowledge of the health sciences was of

little importance. Finally, because very few of the respondents, and according to a past survey, few health sciences librarians overall, hold a degree in the health sciences, yet they are able to carry out their jobs, it may be felt to be of little importance [5].

Currency, while recognized by the majority of respondents as important, was seen as less important by those with more experience in the field. A much larger percentage of the more experienced participants listed administration as one of their primary responsibilities, while fewer of them had other responsibilities such as reference or user education. Several administrators commented that knowledge of the health sciences was no longer very important to them, because their duties were largely managerial, so this may explain the difference in importance attributed to keeping current with the literature.

Interpreting the results of this survey was difficult because ethics regulations made it necessary to give respondents the option to not respond to as many of the questions as they wished. This meant that nearly every question was answered by a different number of respondents. Thus, it was difficult to compare the responses to different questions, for example, to determine the relative ranking of the continuing education methods.

A comparison with the Canadian study

The greatest difference between the responses from the American sample and that of the 2004 survey of Canadian librarians [6] was that a larger and statistically significant different percentage of American respondents (50.0%) than Canadian respondents (30.0%) rated a degree in the health sciences as very or somewhat important. It is hard to say why this was the case. Certainly, the larger number of health sciences degree holders among the American respondents (11.7% compared with 6.7% of Canadian respondents) could explain part of this difference.

Otherwise, the responses of the two groups were strikingly similar. First, the distribution of responses indicating the importance of keeping up with the literature (93.3% in Canada felt it was somewhat or very important compared with 80.0% in the US) was not significantly different. Second, the amount of time devoted to continuing education, although on average higher in the Canadian sample (6.0 h compared with 4.4 h in this study), was not statistically significantly different because of the large amount of variance within the two groups. Third, the relative ranking of the methods for keeping up-to-date was the same in both samples, with the largest numbers of respondents indicating that professional associations were "very useful". In the two surveys, the professional association to which the largest number of respondents belonged was their respective national health library association (Canadian Health Libraries Association or Medical Library Association). Visiting Web sites, browsing or reading journals, reading electronic discussion lists and studying independently, taking university and community college courses, and finally watching or listening to television or radio shows were (in descending order) the next most popular continuing education activities.

When asked to identify disciplines that were equally or more important than the health sciences, the two groups of respondents both listed computer science and technology,

administration, statistics and research methods, basic sciences, education, and the liberal arts, although the US respondents were unique in mentioning library and information science.

One large difference was in the percentage of respondents who belonged to AHIP: 37.5% in the US versus 3.3% in Canada. However, since AHIP is a program of the Medical Library Association, an organization based in the US, and since the majority of Canadian respondents belonged to the Canadian Health Libraries Association rather than the Medical Library Association, it is not surprising that a larger percentage of American respondents are AHIP members.

The overwhelming similarity of responses between the Canadian and US samples lends credibility to these data as a reflection of the beliefs of northern North American (i.e., excluding Mexican) academic health sciences librarians.

Conclusions

Academic health sciences librarians in both the US and Canada feel that continuing education in the disciplines they serve is important; however, few hold a degree in these areas, and only some see such degrees as useful.

Professional associations play an important part in allowing academic librarians to keep up with the health sciences.

While respondents generally felt that keeping up-to-date with the literature was important, the amount of time spent on this varied widely.

Acknowledgements

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Appendix A appears on the following page.

Appendix A

1. Apart from library and information science, in which subject(s) (e.g., history, psychology) is/are your degree(s)?
2. How important do you feel it is that your position be filled by someone who has a degree in a health sciences field (nursing, medicine, dentistry, pharmacy, physiotherapy, etc.)?
 - a. very important
 - b. somewhat important
 - c. not very important
 - d. not at all important
3. Are there areas of study other than the health sciences that you consider more important to your position? Equally important? Please explain.
4. To which of the following electronic newsletters do you subscribe? (Please check all that apply.)
 - a. CANMEDLIB
 - b. MedLib-L
 - c. STS-L
 - d. None
5. Are there other electronic newsletters on the topic of health librarianship to which you subscribe? Please list them here.
6. Which of the following weekly science or health science journals or magazines do you read or browse at least once a month? (Please check all that apply.)
 - a. BMJ
 - b. Canadian Medical Association Journal
 - c. JAMA
 - d. Lancet
 - e. Medical Post
 - f. Nature
 - g. New England Journal of Medicine
 - h. New Scientist
 - i. Science
 - j. None
7. Are there science or health science journals or magazines other than those listed above that you read or browse at least once a month? Please list them here.
8. Which of the following monthly science or health sciences journals or magazines do you read or browse at least once every three months? (Please check all that apply.)
 - a. Canadian Nurse
 - b. Discover
 - c. Journal of the American Dental Association
 - d. Journal of the Canadian Dental Association
 - e. Nursing 2006
 - f. Popular Science
 - g. Quintessence International
 - h. None
9. Are there monthly science or health science journals or magazines other than those listed above that you read or browse at least once every three months? Please list them here.
10. To which health science or science librarianship professional organizations do you belong? (Please check all that apply.)
 - a. ACRL – Science and Technology Section
 - b. Canadian Health Libraries Association
 - c. Medical Libraries Association
 - d. Special Library Association – Biomedical and Life Sciences Division
 - e. Special Library Association – Science-Technology Division
 - e. None
11. Do you belong to any other health sciences library or science library professional associations? Please list them here.

12. Are you a member of the Academy of Health Information Professionals (AHIP)?
 - a. Yes
 - b. No
13. Which of the following radio or television programs do you listen to or watch once a month or more? Please check all that apply.
 - a. Nature of Things
 - b. Nova
 - c. Quirks and Quarks
 - d. Scientific American Frontiers
 - e. Other
14. Do you watch or listen to other health sciences or science-related radio or television shows at least once a month? Please list them here.
15. Do you visit any science or health science-related web sites on a weekly or more frequent basis for your own education (i.e., not to answer reference questions, etc.) If yes, which ones? Please provide either the URL or web site name.
16. Please estimate how many hours you spend per week doing the activities mentioned in the previous questions (reading electronic newsletters, reading or browsing journals, watching television or radio programs, visiting websites, and participating in activities organized by professional organizations.)
17. Are you currently taking any university or community college courses in the science or health field? If so, in which area(s) (e.g., nutrition, medical terminology)?
18. To what extent is keeping current with the scientific or medical literature important to doing your job?
 - a. Very important
 - b. Somewhat important
 - c. Not very important
 - d. Not at all important
19. How useful do you find the following activities for gaining or maintaining knowledge of the health sciences?
 - a. Electronic newsletters
 - b. Journals or magazines
 - c. Professional organizations
 - d. Television or radio shows
 - e. Websites
 - f. University or community college classes
 - g. Independent study (i.e., study of textbooks, etc., without being registered in a course)
20. Are there activities not listed above that you find useful for gaining or maintaining knowledge of the health sciences? Please list them here.
21. What is/are your primary responsibility/responsibilities? (Please check all that apply.)
 - a. Administration
 - b. Cataloging
 - c. Collection Development
 - d. Interlibrary Loan
 - e. Reference
 - f. Systems/Information Technology
 - g. User Education
 - h. If your primary responsibility/responsibilities was/were not listed above, please list them here.
22. How long have you worked in health sciences or science libraries?
 - a. Less than 2 years
 - b. 2–5 years
 - c. 6–10 years
 - d. 11–15 years
 - e. More than 15 years

Thank you very much for taking the time to complete this survey.