Mapping the literature of health education: 2006–2008

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Objectives: The study updates Schloman's 1997 study, ''Mapping the Literature of Health Education.'' The authors identify an updated list of core health education journals and determine the coverage of these journals by electronic indexes.

Methods: Citations from four source journals for the years 2006 to 2008 were analyzed using the established methodology of the ''Mapping the Literature of Allied Health Project.'' The cited journals were divided into three zones of productivity by using Bradford's Law of Scattering.

Results: There were 19,907 citations in 602 source articles. Journal articles were the most commonly cited format type. Of the 1,896 journal titles cited, 20 (1.1%) made up the core journals. Together, the fields of medicine, health education, and psychology accounted for 85.0% of the journals in the core. Self-citation was found to be a common practice in the source journals. Scopus had the broadest journal coverage of the indexes examined.

Conclusions: The results of this study provide a new picture of the health education literature: The volume has grown significantly, cites older materials, and relies less on sexual health journals and more on psychology journals.

INTRODUCTION

In 1997, a symposium, ''Mapping the Literature of Allied Health,'' appeared in the *Bulletin of the Medical Library Association* [1]. Using citation analysis, the authors provided a quantitative description of the literature of several allied health fields. One of the articles in that volume, Schloman's ''Mapping the Literature of Health Education,'' provided a snapshot of the health education journal literature as seen in a three-year window (1991–1993). Schloman primarily examined research articles, thus providing empirical evidence of the composition of the research literature of the field. The author's purpose was to determine the core journal literature and indexing coverage of the literature ''at this time,'' 1991–1993. In her conclusion, she anticipated that future updates might be done that would indicate changes in these areas and might provide useful information for collection developers, health educators, and indexing vendors [2]. The purpose of this study is to provide an update to Schloman's study to obtain a current, evidence-based picture of the literature of health education to inform library practice.

Health education is defined as ''any combination of planned learning experiences based on sound theories that provide individuals, groups, and communities the opportunity to acquire information and skills needed to make quality health decisions'' [3]. Any multidisciplinary field such as health education presents special challenges for collection development and reference librarians. The ability to select materials from multiple areas, as well as indexes that provide access to these materials, is often constrained by fiscal realities. In addition, researchers, students, faculty, and practitioners may be overwhelmed by the breadth of the resources and unsure of where to focus their attention. Professional judgment is important when deciding on purchases or recommending materials to patrons, but it can be greatly assisted by objective evidence.

Librarians should also note that insufficient diffusion of research findings to practicing health educators is an ongoing problem in health education. McDermott has stated that the lack of dissemination of health education research to the practitioner is one of ''the seven deadly sins of health education researchers'' [4].

Highlights

- Three of the four health education journals in this study showed a statistically significant increase in the number of journal articles published since 1993.
- The majority of core journals in the field are from medicine (35.0%), health education (30.0%), and psychology (20.0%), with the largest change in core journal make-up being an increase in psychology journals.
- Scopus provided the most thorough coverage of the cited journals, followed by MEDLINE, Social Sciences Citation Index, and CINAHL Plus with Full Text.

Implications

- Reference librarians should instruct users on more sophisticated ways to manage the growing volume of the health education literature.
- Collection development librarians may need to purchase and retain older materials to support health education research.
- Librarians should purchase and direct patrons to a variety of databases to completely cover the literature of medicine, health education, and psychology.

Supplemental Table 6 is available with the online version of this journal.

The second invitational conference of the Coalition of National Health Education Organizations, ''Improving the Nation's Health Through Health Education—A Vision for the 21st Century,'' was held in 2002. One of the five ''focal areas'' for future development that were developed at the conference was ''conducting, translating & disseminating research into dynamic & contemporary practice'' [5]. As noted in a 2007 article about the state of evidence-based practice (EBP) in the allied health professions:

> Overall, EBP's penetration into health education and promotion is in its infancy. Many factors affect how health educators use evidence to inform health promotion practice. Research training and exposure to EBP during academic preparation, access to information resources in the practice setting, quality of the available literature addressing the information need, and the time and energy available to devote to investigation all play a role. Relevant information for health educators is dispersed among the literature in a wide variety of disciplines, including studies of various levels of methodological rigor using diverse evaluation techniques. [6]

Librarians need current data about core literature and indexes that provide access to those materials if they are to help practicing health educators, students, and faculty find the evidence they need.

Since Schloman's study, a number of studies [7, 8] and the Public Health/Health Administration Section (PH/HA) of MLA [9] have developed core journal lists for the health education field based on the authors' or others' opinion of the quality of a journal. Known as the ''prestige method,'' this is one approach to ranking journals. Price and Robinson [8] and the PH/HA list [9] also used Thomson Reuters/ISI's journal impact factors [10] to construct their lists, but their primary approach was not quantitative. Prestige-based lists have the advantage of providing expert opinions on the quality of journals, which is especially useful for making collection decisions about material for small but important subspecialties where quantitative evidence may be lacking. However, prestige-based lists can incorporate the biases of the experts. Only one study [11] since Schloman's original work used a strictly quantitative approach to generating a core journal list. The authors of that paper ranked journals based on the percentage of health education responsibilities mentioned in abstracts. However, this approach shows only how related the journals are to health education responsibilities, rather than giving a numeric indication of how frequently the journals are cited.

METHODS

This study primarily uses the methodology outlined in the Nursing and Allied Health Resources Section (NAHRS) ''Mapping the Literature of Allied Health Project'' [12]. The project methodology calls for source journals to be selected from the Brandon/Hill allied health list or the official journals of professional associations in the field. To facilitate comparison with previous research, the authors decided to include only the journals used by Schloman's 1997 study. Those were the *American Journal of Health Education (AJHE)*, which is the official journal of the American Association for Health Education and was called the *Journal of Health Education (JHE)* at the time of Schloman's study; *Health Education and Behavior (HEB)*, which is the official journal of the Society of Public Health Educators and was known as *Health Education Quarterly (HEQ)* at the time of Schloman's study; the *Journal of American College Health (JACH)*, which is the official journal of the American College Health Association; and the *Journal of School Health (JSH)*, which is the official journal of the American School Health Association.

Research and feature articles from the four source journals from the last three years, 2006–2008, were reviewed for inclusion in the study. Reprints, editorials, commentaries, presidents' addresses, teaching ideas, and clinical and practice notes were eliminated from the analysis. Also omitted was one issue of the *JSH* that consisted of a single report on school health law, because it would bias the results as it was not representative of the rest of the issues of that journal. The citations in the reference lists were examined, and the following information was collected: cited item format, cited journal title, cited year, and year of publication. The categories used to identify formats were those used by Schloman (book, journal article, government documents, and miscellaneous) with the addition of a category for Internet sites for those items whose references included a uniform resource locator (URL) but were not government documents or journal articles. Following Schloman, the books category was used for all monographs except those published by a governmental source. All serials, including government publications, in any format, were counted as journals. Government documents included non-serial items in any form published by an international, national, state, or local governmental agency (e.g., United Nations Educational, Scientific and Cultural Organization [UNESCO], New York State Department of Public Health). The miscellaneous category accounted for all other types of materials (e.g., dissertations, software, newspapers, and newsletters).

To determine the core journals in health education and measure the dispersion of the field, Bradford's Law of Scattering was applied. The law predicts that ''for any specialty, a relatively small core of journals can be expected to account for a disproportionate amount of the literature'' [13]. The cited journal titles were ranked in order of frequency, and then the list was divided into three zones, with each zone containing roughly a third of the citations. Bradford's Law predicts that Zone 1 will contain the both the smallest number of titles and the most frequently cited journals and thus form the core list of journals. Zone 2 will contain the next most productive set of journals and be larger in number, while the set of journals in Zone 3 would be both the largest and the least often cited.

Indexes were checked for coverage of cited journal titles in Zone 1 and Zone 2. Schloman analyzed CINAHL, EMBASE, ERIC, MEDLINE, and PsycINFO. This study analyzed these databases as well, with the

Table 1
Cited format types by source journal and total frequency

Cited format type	Source journal								Totals	
	AJHE		*HEB*		*JACH*		*JSH*			
	No.	%	No.	%	No.	%	No.	%	No.	%
Journal articles	2,295	72.2	3,918	72.7	4,215	76.0	4,145	71.6	14,573	73.2
Government publications	302	9.5	396	7.3	388	7.0	640	11.0	1,725	8.7
Books	293	9.2	839	15.5	514	9.3	618	10.7	2,264	11.4
Internet sites (nongovernmental, non-journal)	160	5.0	58	1.1	187	3.4	240	4.2	646	3.2
Miscellaneous	130	4.1	182	3.4	239	4.3	148	2.6	699	3.5
Total citations	3,180	100.0	5,393	100.0	5,543	100.0	5,791	100.0	19,907	100.0
Total source articles	98		137		172		195		602	

AJHE=American Journal of Health Education.
HEB=Health Education and Behavior.
JACH=Journal of American College Health.
JSH=Journal of School Health.

exception of using CINAHL Plus with Full Text instead of CINAHL. The CINAHL Plus product was used for this study to use the current version of CINAHL with the most extensive coverage of journals, but with the understanding that results would not be automatically comparable to those obtained by Schloman for CINAHL. The current study also examined the coverage provided by Science Citation Index Expanded (SCIE), Social Sciences Citation Index (SSCI), and Scopus. To determine the exclusive coverage of these databases, MEDLINE citations were excluded from the results for EMBASE by searching for EMBASE-only citations in EMBASE and MEDLINE-sourced citations (i.e., citations that were supplied by MEDLINE and not by the journal publisher or created by Scopus) were excluded from Scopus [14].

Each journal in Zone 1 was categorized according to its primary subject affiliation (e.g., health education, medicine, nutrition, psychology, and public health). Journals in Schloman's Zone 1 were also categorized for comparison purposes.

RESULTS

There were 19,907 citations in 602 source articles (articles that met the criteria for the study) in the 4 source journals during the years 2006–2008 (Table 1), a sizable increase from the 11,054 citations from 472 articles found in the original study [2]. The percentage of citations coming from journal articles was fairly consistent across all source journals, ranging from 71.6%–76.0%. The percentage of miscellaneous citations in Schloman's study was 10.3%, while 3.5% of the references in this study were to miscellaneous items. This study categorized Internet citations separately, but even combining those citations with the miscellaneous citations would result in a lower overall percentage (6.7%) here than for the miscellaneous category in Schloman's study. There was considerable self-citing by source journals, that is, the articles in a source journal contained citations to the source journal. The percentage of self-citation was the highest for *JACH* with 10.5%, followed by *JSH* (7.4%), *HEB* (5.0%), and *AJHE* (3.9%).

Comparing the current results with Schloman's, there were statistically significant changes in the number of source articles for all 4 source journals at the 95% confidence level (Table 2). The total number of articles and the number of source articles decreased for *AJHE*. *AJHE* is published on a bimonthly schedule. *JHE* was normally published on a bimonthly schedule, but it had 2 more ''issues,'' a special issue with 16 total articles and 13 source articles and a supplement with 14 total articles and 6 source articles, during the 1991–1993 time frame. If the special issue and the supplement are excluded, the decrease is still statistically significant (total number of articles, $t=4.054$, $df=31.378$, $P=0.000$; number of source articles, $t=5.610$, $df=33.910$, $P=0.000$). However, while the number of source articles for *AJHE* decreased, the number of source articles for *HEB*, *JACH*, and *JSH* increased. In the current study period alone, *JACH* increased the total number of articles and source articles from an average of 7.89 and 5.89 per issue from January/February 2006 to May/June 2007 to an average of between 16.10 and 13.30 per issue from July/August 2007 to November/December 2008.

JSH published 10 issues a year from 2006 to 2007, but increased to 12 issues in 2008 (although as noted previously, 1 issue was not used in this study). *HEB* was on a quarterly publication schedule from 1991–1993 and a bimonthly schedule from 2006–2008. The changes for *HEB* (Table 2) were not statistically significant if the individual issues are considered, possibly because the average total number of articles per issue did not change drastically and the average number of source articles per issue was basically unchanged (Table 2). However, if the 2006–2008 issues are grouped into quarters in order to be comparable to the 1991–1993 issues, there are statistically significant differences using a 2-tailed *t*-test for the total number of articles ($t=3.038$, $df=25.606$, $P=0.005$) and the number of source articles ($t=4.673$, $df=21.026$, $P=0.000$).*

* The total number of articles and number of source articles in the second and fifth issues of each year were split in half and added to the totals for the first and third, and fourth and sixth issues, respectively.

Table 2
Total articles and source articles published: 1991–1993 and 2006–2008

	JHE/AJHE		*HEQ/HEB*		*JACH*		*JSH*	
	1991–1993	2006–2008	1991–1993	2006–2008	1991–1993	2006–2008	1991–1993	2006–2008
Total articles published								
Number of articles	237	164	131	178	148	215	258	301
Number of issues	20	18	12	18	18	18	30†	32
Average articles per issue	11.90	9.11	11.00	9.89	8.22	11.90	7.70	5.44
Standard deviation‡	2.21	1.49	1.70	1.45	2.44	4.73	2.60	4.90
t value*	−4.521		−1.734		2.966		0.821	
df	33.518		21.291		25.43		47.587	
P value	0		0.097		0.006		0.416	
Source articles published								
Number of articles	153	98	91	137	86	172	142	195
Number of issues	20§	18	12	18	18	18	30	32
Average articles per issue	7.7	5.44	7.60	7.61	4.78	9.56	4.73	6.09
Standard deviation‡	1.60	1.10	2.10	1.04	1.44	4.18	2.55	2.32
t value*	−4.934		0.042		4.59		2.195	
df	33.448		14.587		20.971		58.537	
P value	0		0.967		0		0.032	
Average citations per article	21	29.7	31	39	20.9	32.2	23.2	29.7

* Using two-tailed test, equal variances not assumed.
† One issue deleted.
‡ Standard deviation of number of articles.
§ One special issue and one supplement included.
HEQ=*Health Education Quarterly* (former title of *HEB*).
JHE=*Journal of Health Education* (former title of *AJHE*).

To account for the 80.1% increase in citations and changes in the number of source articles in this study, the source articles for 1991–1993 in *HEQ*, *JACH*, *JHE*, and *JSH* were tallied by this study's authors to determine if there was a difference in categories used for source article types between this and the prior study. However, results were the same as previously reported. The increase in the average number of citations per source article shown by all of the source journals was statistically significant using a paired samples *t*-test ($t=8.601$, $df=3$, $p=0.003$).

The currency of cited materials has decreased since Schloman's study. Excluding items for which dates were not available, this change was statistically significant ($\chi^2=424.88$, $df=3$, $P=0.00$). In Schloman's study, 66.2% of the all the citations were from the 5 years immediately preceding the study period and the study period itself (Table 3). The current study found that only 55.5% of the materials were from the comparable period, that is, with a cited date later than 1999. Older books continued to be cited more frequently than older materials in other categories, with only 39.5% within the study period and the 5 preceding years in this study, compared to 51.0% in Schloman's study. The miscellaneous materials in this study were the most current, with 63.9% in the 2000–2008 time frame, while government documents were the category with the most current items in Schloman's study.

There were 1,896 journals cited after all current and previous titles for a journal were combined (Table 4). Bradford's Law of Scattering [13] still applies to the journal literature of health education: a relatively small core of journals (1.1%) made up Zone 1, while only a slightly larger group of journals (6.8%) made up Zone 2. The difference in the number of titles in Schloman's Zones 1 and 2 and this study's Zones 1

Table 3
Cited format types by publication period

	Books		Government documents		Internet		Journals		Miscellaneous		All formats	
Publication year	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
2005–2008*	162	7.2	273	15.8	148	22.9	1,847	12.7	115	16.5	2,545	12.8
2000–2004	732	32.3	762	44.1	147	22.8	6,535	44.8	331	47.4	8,507	42.7
1995–1999	576	25.4	237	13.7	28	4.3	3,501	24.0	134	19.2	4,476	22.5
1990–1994	314	13.9	60	3.5	7	1.1	1,541	10.6	65	9.3	1,987	10.0
1980–1989	283	12.5	34	2.0	7	1.1	889	6.1	43	6.2	1,256	6.3
1970–1979	111	4.9	11	0.6	0	0	162	1.1	3	0.4	287	1.4
1960–1969	58	2.6	6	0.3	0	0	58	0.4	1	0.1	123	0.6
<1960	27	1.2	7	0.4	0	0	40	0.3	0	0	75	0.4
No dates	0	0	336	19.5	308	47.8	0	0	7	1.0	651	3.3
Total	2,264	100.0	1,726	100.0	645	100.0	14,573	100.0	727	100.0	19,907	100.0

* Includes in press materials.

Table 4
Distribution by zone of cited journals and references

Zone	Cited journals		Cited journal references		Cumulative total
	No.	%	No.	%	
1	20	1.1	4,897	33.6	4,897
2	129	6.8	4,875	33.5	9,772
3	1,747	92.1	4,801	32.9	14,573
Total	1,896	100.0	14,573	100.0	

and 2 is not statistically significant ($\chi^2=0.12$, $df=2$, $P=0.94$); dispersion has remained unchanged, even though the total number of titles has increased.

Table 5 lists the journals in Zone 1 and the indexing scores for Zone 1 and Zone 2, which together represent the journals of primary and secondary importance to the field of health education. (For a complete list of Zone 2 titles, see Table 6, online only.) Together, the categories of medical, health education, and psychology made up the majority (85.0%) of the journals in Zone 1, with public health and nutrition journals accounting for the remaining titles (Table 5). Compared to Schloman's Zone 1, the largest increase was seen in the number of psychology journals in Zone 1 (from 1 journal to 4 journals). Unlike Schloman's study, sexual health journals were not represented in Zone 1. As Schloman also noted, there were no general education journals in Zone 1.

One of Schloman's goals for her study was for database vendors to be prompted to provide better coverage of the health education journal literature, thus improving access for researchers [2]. Indexing coverage of the health education literature appears to have improved in general, even excluding Scopus, which was not in existence at the time of Schloman's study, or SCIE and SSCI, which were not examined by Schloman. This study found that 6 databases—CINAHL Plus with Full Text, EMBASE, MEDLINE,

Table 5
Distribution and indexing coverage in 2008 of cited journals in Zones 1 and 2

Cited journal [category]	No. of citations	CINAHL Plus with Full Text	EMBASE	ERIC	MEDLINE	PsycINFO	Science Citation Index Expanded	Scopus	Social Sciences Citation Index
Zone 1									
1. J Am Coll Health [H]	483	5	0	5	5	2	0	5	5
2. Am J Public Health [PH]	440	4	4	0	5	2	5	4	5
3. JAMA [M]	429	3	4	0	4	1	5	4	1
4. J Sch Health [H]	404	5	0	3	4	0	4	4	4
5. Health Educ Behav (formerly, Health Educ Q, preceded by Health Educ Monogr) [H]	321	4	0	2	5	4	0	4	3
6. Prev Med [M]	294	5	5	0	5	2	5	5	3
7. Pediatrics [M]	275	4	4	0	4	1	5	4	1
8. J Adolesc Health, (formerly, J Adolesc Health Care)* [M]	248	3	3	0	3	3	5	3	5
9. Am J Prev Med [M]*	235	4	5	0	5	2	5	5	3
10. J Stud Alcohol Drugs, (formerly, J Stud Alcohol)* [P]	215	5	5	0	5	5	5	5	5
11. MMWR Morb Mortal Wkly Rep* [PH]	185	5	0	0	3	0	0	4	0
12. Arch Pediatr Adolesc Med* [M]	183	4	5	0	4	0	5	5	2
13. J Am Diet Assoc [N]	181	5	0	0	4	0	5	4	1
14. Med Sci Sports Exerc (formerly Med Sci Sports)* [M]	173	5	4	0	4	0	5	5	1
15. J Consult Clin Psychol (formerly J Consult Psychol) [P]	155	0	5	5	5	5	0	5	5
16. Addict Behav* [P]	144	5	5	0	5	5	5	5	5
17. Health Psychol* [P]	141	5	5	0	5	5	5	5	5
18. Health Educ Res* [H]	140	5	5	0	5	5	0	5	5
19. Am J Health Educ (formerly, J Health Educ, preceded by Health Educ, preceded by Sch Health Rev) [H]	135	5	0	3	0	0	0	4	0
20. Am J Health Promot [H]	116	5	5	0	3	3	0	5	4
Zone 1 total indexing coverage score		86	64	18	83	45	64	90	63
Zone 1 average indexing coverage score		4.30	3.20	0.90	4.15	2.25	3.20	4.50	3.15
Zone 2 total indexing coverage score		378	313	85	461	328	305	528	404
Zone 2‡ average indexing coverage score		2.93	2.43	0.66	3.57	2.54	2.36	4.09	3.13
Overall indexing coverage score		464	377	103	544	373	369	618	467
Average overall indexing coverage score		3.11	2.53	0.69	3.65	2.50	2.48	4.15	3.13

Indexing coverage scale: 5 (95%–100%); 4 (75%–94%); 3 (50%–74%); 2 (25%–49%); 1 (1%–24%); 0 (<1%).
Journal categories: [H]=health education; [M]=medical; [N]=nutrition; [P]=psychology; [PH]=public health.
* Journal is new to Zone 1 (since Schloman's study).
† Journal dropped out of Zone 1 (since Schloman's study).
‡ Complete list of Zone 2 titles is available in Table 6, online only.

SCI, Scopus, and SSCI—covered at least 50% of the citations of the cited titles in Zone 1, compared to 2 indexes (EMBASE, MEDLINE) in Schloman's study.

For combined Zone 1 and Zone 2 indexing coverage, Scopus, even excluding MEDLINE-sourced titles, had the most complete coverage. However, the Web of Knowledge platform includes both SCIE and SSCI, and both may be searched together. If the maximum scores for SCIE or SSCI are combined, their Zone 1 average score is 4.30. Their average overall indexing score for both Zone 1 and Zone 2 of 4.18 slightly exceeds that of Scopus alone. Combining Scopus coverage with MEDLINE yields a Zone 1 average score of 4.60 and an overall score of 4.36 for Zones 1 and 2 combined. Combining EMBASE coverage with MEDLINE yields a Zone 1 average score of 4.30 and an overall average score of 3.80. Combining CINAHL Plus with Full Text with MEDLINE coverage would yield a Zone 1 average score of 4.74 and an overall average score of 4.01.

LIMITATIONS

The primary limitation to this study is the selection of the source journals. As noted earlier, to provide an update to Schloman's health education mapping study [2], the same four journals were analyzed. Using the scholarly journals of other health education–related associations could have yielded different results.

Using association journals is problematic. Price and Robinson [8] point out that ''journals associated with professional organizations may be cited more frequently because they are easily available.'' Because this is the case, future studies might include journals that are not official publications of a professional association to partially mitigate this effect. *Health Education Research* and the *American Journal of Health Promotion* would be good candidates, as they are broad health education journals not associated with a professional organization and were found to be core journals in this study.

This study provides an overview of a specific three-year window of the four source journals. Results cannot be generalized to other health education journals or time spans.

Another limitation of this study is the sole reliance on raw citation counts as a data source. Among other problems, using raw counts does not account for the effects of self-citation, either at the individual or journal levels [15].

DISCUSSION

The results of this study suggest a number of important implications for librarians who work with the health education literature. There has been a significant increase in the research literature of health education in three of the four source journals. For *HEB*, the reason for the increase in the number of articles and citations is somewhat obvious: The formerly quarterly journal is now a bimonthly journal. But the reasons for the increases observed in *JACH* and *JSH* are less clear. *AJHE* experienced a statistically significant, but unexplained, decrease in the number of articles overall as well as a decrease in the number of source articles. However, the total number of citations for *AJHE* remained virtually the same, probably because of the increase in the average number of citations per article (Table 2). The overall dramatic increase in the volume of published articles suggests that librarians need to increase their efforts to instruct end users of the health education literature on ways to focus their searches, as well as in more sophisticated ways to manage their bibliographies and keep up-to-date on new material (e.g., really simple syndication [RSS] tables of contents feeds and bibliographic management tools).

The age of books cited by the health education literature has continued to increase. This has important implications for collection development librarians, who may want to consider the purchase of older ''classic'' books in the field as well as weeding practices that retain older books that are still relevant.

While there was a clear decrease in the currency of cited books in this study, the observed decrease in the currency of materials overall might be due to the absence of a publication date in 20.2% of cited government documents (predominantly Internet-based resources) and 48.1% of cited nongovernmental Internet sources. The authors believe that this was due in part because Schloman's study did not have as many Internet resources, probably because the explosion in web-based resources did not take place until after Schloman's study period [16].

The lack of publication dates for many of the online sources is problematic not just for citation analysis, but also for researchers. It is true that Internet content may be frequently updated and that one cannot be sure that one is seeing exactly the same content as that cited in the original article, but dates provide researchers with an indication of whether the material has changed.

The increase in citations to Internet-based resources may have other important implications for researchers and librarians in the future. The traditional sources of cited information, journals, books, and government documents are being increasingly supplemented by miscellaneous and Internet-based sites. According to Alpi and Hill, the web and other nontraditional publication media could become an important tool in disseminating evidence for practice in health education: ''Broad dissemination of this collected evidence via the Web and health education professional organizations, through programs as well as professional publications, could ultimately influence the movement of that evidence from the research literature to practice'' [6]. Librarians need to remember that the research literature is only one source of evidence for practice for health educators. Alpi and Hill suggest that collaborative networks may be the key to disseminating evidence because these networks may bring to light ''much of the evidence in health education [that] resides in the minds and files of program personnel and individual health educators rather than in the published literature'' [6]. Librarians could assist their patrons in using these networks by pointing them to discussion lists and

instructing them in the use of Web 2.0 tools (e.g., wikis, Twitter, etc.) for the dissemination of research findings.

Also of note for both collection development and reference librarians is the increased importance of psychology journals that this study found. Helping people change unhealthy behaviors is a goal, not just of health educators, but of the practitioners of many other disciplines, including psychology; therefore, it is not surprising that health educators find valuable material in psychology journals. Coupled with the continuing lack of use of general education journals noted in this study, this situation reflects an ongoing trend in health education research favoring what Buchanan calls ''the medical model,'' or use of the scientific method to determine the causes of health behavior and effect change and control behavior, over the ''education model'' [17]. While many libraries already purchase psychology journals, special attention should be paid to ensuring access to journals that cover health psychology and the psychology of substance abuse and other addictive behaviors.

Collection development librarians may wish to consider adding subscriptions to either Scopus or to the combination of SCI and SSCI to their libraries' resources. Reference librarians should direct health education researchers to either Scopus or the combination of SCI and SSCI. However, for libraries facing budget crunches, providing the combination of the relatively less expensive databases CINAHL Plus with Full Text and MEDLINE (which is also available at no charge as PubMed) may be a more feasible option, providing indexing coverage for at least 75% of the titles overall. However, libraries should also provide access to and direct users to PsycINFO to ensure proper coverage of the psychology journals.

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