Mapping the literature of athletic training

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DOI: 10.3163/1536-5050.95.2.195

Purpose: This paper identifies the core literature of athletic training and determines which major databases provide the most thorough intellectual access to this literature.

Methods: This study collected all cited references from 2002 to 2004 of three journals widely read by those in the athletic training field. Bradford's Law of Scattering was applied to the resulting list to determine the core journal titles in the discipline. Three major databases were reviewed for extent of their coverage of these core journals.

Results: Of the total 8,678 citations, one-third referenced a compact group of 6 journals; another third of the citations referenced an additional 40 titles. The remaining 2,837 citations were scattered across 1,034 additional journal titles.

Conclusions: The number and scatter of citations over a three-year period identified forty-six key journals in athletic training. The study results can inform athletic trainers of the core literature in their field, encourage database producers (e.g., MEDLINE, SPORTDiscus, CINAHL) to increase coverage of titles that are not indexed or underindexed, and guide purchasing decisions for libraries serving athletic training programs.

INTRODUCTION

The field of athletic training encompasses preventing, evaluating, and managing injuries in the athletic environment, as well as designing and supervising rehabilitation programs that enable injured athletes to return to activity [1]. The athletic trainer is a pivotal member of the sports medicine team and closely cooperates with team physicians, physical therapists, and other health care professionals. Of all the members of the sports medicine team, the athletic trainer is perhaps most intimately involved in the lives of the athletes, often traveling with teams, standing at the sidelines, and following injured athletes from emergency care, diagnosis, therapy, and return to play. Responding to athletic emergencies in sports venues is an important role of the athletic trainer, and athletic trainers frequently serve as the first contact for injured participants [1].

In the field of athletic training, the shift to incorporate research evidence more fully into clinical practice has resulted in increased emphasis on the use of the professional literature. Like all professions, athletic training has a central body of literature that serves as its knowledgebase and helps define the intellectual scope of the field. This study is the first attempt to describe the literature of this profession and identify its core journals. It is an installment in the ongoing Mapping the Literature of Allied Health Project of the Nursing and Allied Health Resources Section (NAHRS) of the Medical Library Association, first described by Schloman in 1997 [2]. In addition to providing a brief description of the profession, this paper identifies the formats and currency of literature used by authors in the athletic training field, as well as the core journal titles and the extent of their coverage by major indexes of the journal literature. The findings are particularly significant to practitioners in the field, health sciences librarians serving athletic trainers in both clinical and academic settings, and indexing and abstracting services.

Highlights

- This paper reviews the development of athletic training as a recognized health sciences profession and current issues and trends in the profession.
- This is the first published study to characterize the nature and scope of the literature of athletic training and to identify its core journal titles.
- This study identified six titles that constitute the core journal titles in athletic training and forty additional journal titles that are the next most heavily used. The citing patterns of these journals indicate that the literature of athletic training draws heavily from the fields of sports medicine, physical therapy, rehabilitation, orthopedics, and physiology.

Implications

- Comprehensive literature searches must be performed in multiple databases, as no one product covers the field of athletic training thoroughly.
- The findings serve as a guide for making journal and database purchasing decisions in academic and health sciences libraries.
- MEDLINE, SPORTDiscus, and CINAHL can add value to their products by increasing coverage of the forty-six titles identified in this study.

History of the athletic training profession

The profession of athletic training had its beginnings in the late nineteenth century with the formation of intercollegiate and interscholastic sports programs in the United States. The ''athletic trainers'' of this era

were largely uneducated and scantily trained, described as ''persons of questionable background and experience'' whose techniques consisted mostly of the application of counterirritants and the prescription of various home remedies [1]. After World War I, intercollegiate programs expanded dramatically and with them the need for a staff of competent trainers. In 1917, Samuel ''Doc'' Bilik, a physician practicing in the New York area, published the first major text for the field, *The Trainer's Bible* [3]. In the early 1920s, Chuck and Frank Cramer founded the Cramer Chemical Company in Gardner, Kansas, which started a unique industry for athletic training products, including a popular liniment for treating ankle sprains. In 1932, the Cramers started publishing *The First Aider,* a monthly publication designed to connect and inform members of the nascent profession [4].

In 1939, a prototypical national organization for athletic trainers was formed, and, although it folded during the difficult years of World War II, it was nevertheless an important first step in creating a professional identity [5]. Following the war, various regional organizations were formed, including the Southern Conference Athletic Trainers Association in 1947 and the Eastern Conference Athletic Trainers Association in 1948. In 1950, these regional organizations joined forces to create the National Athletic Trainers Association (NATA), with Chuck Cramer named as its first national secretary [3].

As the primary organization for athletic trainers, NATA was created to establish standards for professionalism, education, certification, research, and practice settings, all hallmarks of a true profession. The constitution and bylaws were written in 1951, followed by the adoption of a code of ethics in 1957. The *Journal of the National Athletic Trainers' Association,* precursor to today's *Journal of Athletic Training,* began publication in 1956 [3]. In 1969, the American Medical Association (AMA) passed a resolution acknowledging the importance of athletic trainers, and, in June 1990, it granted official recognition of athletic training as an allied health profession, which significantly increased the stature and image of the young profession [5].

Athletic training education, accreditation, certification, and licensure

Indiana State University offered the first comprehensive curricula in athletic training: a four-year undergraduate degree in 1948 and in the following year a master's of science degree in health science with a major in athletic training. NATA developed a model curriculum for athletic training in 1959, and in 1970 the first undergraduate programs were approved at Indiana State University in Terra Haute, Lamar State College in Beaumont, Texas, Mankato State College in Mankato, Minnesota, and the University of New Mexico in Albuquerque. By 1973, the first two graduate curricula were approved at Indiana State University and the University of Arizona [3].

In 1997, the Education Council of NATA was established to determine the educational competencies and clinical proficiencies that should be taught in accredited programs. The current competencies took effect in fall 2006 and include risk management, pathology of injuries, orthopedic assessment and evaluation, acute care of injury, pharmacology, therapeutic modalities, and other skills [1]. On a parallel track, NATA's Board of Certification (BOC) identified six performance domains that define the minimum knowledgebase for an entry-level athletic trainer: prevention, clinical evaluation and diagnosis, immediate care, treatment and rehabilitation, organization and administration, and professional responsibility [1]. Together, the competencies and performance domains serve as guideposts for curriculum development.

After athletic training earned formal recognition by the AMA as an allied health profession, accreditation of athletic training programs was assumed by AMA's Committee on Allied Health Education Accreditation. In 1994, this duty was transferred to the Commission on Accreditation of Allied Health Education Programs (CAAHEP), an accreditation agency recognized by the Council for Higher Education Accreditation (CHEA). In 2006, the Committee for Accreditation of Athletic Training Education, an independent accrediting agency dedicated to this profession and affiliated with CHEA on the same level as CAAHEP, took over accreditation responsibilities [1]. In 2006, there were 328 accredited undergraduate programs in the United States and 13 accredited master's degree programs.

The NATA BOC was established in 1970, followed by administration that year of the first certification exam in Waco, Texas. The initials ATC have been used since then to designate the certified athletic trainer. Prior to January 1, 2004, the BOC accepted an internship route in lieu of graduation from an accredited program as an option to gain eligibility to sit for the certification exam. After that date, one could only become eligible to take the certification exam through successful completion of an accredited entry-level program in athletic training [6].

As of January 2005, thirty-nine of the fifty states regulate athletic trainers in some way, via licensure, state certification, or registration [1]. State certification is not the same as being certified as an athletic trainer by the BOC, although many states use the BOC exam as a criterion for granting state certification.

Issues and trends in athletic training

Currently, NATA represents over 30,000 members, of which 24,000 are certified athletic trainers. More than 50% of NATA's certified athletic trainers are employed outside of school athletic settings. Some of these settings include physician offices, rural and urban hospitals, ambulatory care centers, military hospitals, physical therapy clinics, occupational and industrial settings, and professional sports teams [7]. Although sports medicine clinics were once considered a nontraditional work setting for athletic trainers, today more of them work there than in any other setting. A typical work day for an athletic trainer in these clinics might consist of seeing patients with sports-related in-

juries in the morning, followed by contract work to local high schools or colleges in the afternoon [1].

While many athletic trainers continue to work primarily with athletes, the scope of the profession has expanded to encompass all groups of the physically active population, defined by Prentice as those who ''engage in athletic, recreational or occupational activities that require physical skills and utilize strength, power, endurance, speed, flexibility, range of motion, or agility'' [1]. In situations in which their patient populations overlap, athletic trainers and physical therapists may be in competition for clients. However, whereas physical therapists treat a wide variety of patient populations with a broad range of injuries, athletic trainers focus on treating the physically active population [1]. Their knowledge of first aid and their understanding of the motivation and psychology of performance are further distinguishing characteristics of the athletic trainer [8]. In many situations, athletic trainers work side by side with physical therapists and other health care professionals in a cooperative effort to provide quality health care to physically active people.

Currently, an issue of great importance to the profession is the need to secure third-party reimbursement. Moving toward evidence-based practice is considered critical to achieving this goal. Leaders in the field have begun to call for greater engagement in outcomes research with increased application of results to practice [9, 10]. They further recommend that faculty include accelerated research training in undergraduate and graduate athletic training curricula so that students may gain the skill to interpret, evaluate, and apply new research [9] and ultimately contribute to the body of evidence in the field.

Purpose of study

Throughout its development, the profession of athletic training has generated a unique body of literature. Publications such as the *Journal of Athletic Training* serve as a vital outlet for research in the field and as a means to communicate with, connect, and inform practitioners. To date, no published studies identify the core journals of the profession. Even including the broader discipline of sports medicine, studies of the literature have been few and very limited in scope. Two studies have focused on the content or methodologies published in a single journal title [11, 12]. Other studies have analyzed content, test subjects, instruments, or methodology across several journals and over several years. These studies, prompted by a desire to evaluate the quality of athletic training research, have concluded that the use of rigorous study designs such as randomized controlled trials has steadily increased [13, 14]. Steves and Hootman spoke to the need for increased rigor in athletic training research, adding, ''Athletic training outcomes research is lagging behind that of other health care professions'' [10]. They also noted the lack of published systematic reviews specific to clinical athletic training. The current study sought to identify the currency and predominant formats of athletic training literature, the core journal titles, and the databases that provide the most comprehensive coverage of these journals.

METHODOLOGY

The methodology employed for this study was consistent with that described by Schloman in her overview of the NAHRS Mapping the Literature of Allied Health Project [2]. The first and most critical decision was selecting source journals from which cited references would be analyzed, as this would influence the outcome of the entire project. The following criteria were established for the candidate source journals: the publication must cover most or all of the six BOC performance domains, be peer reviewed, be widely read by athletic trainers in a broad range of settings and specialties, contain articles written by athletic trainers, and have certified athletic trainers on their editorial boards.

The ''Brandon/Hill List of Print Books and Journals in Allied Health,'' last updated in 2003 [15], lists only the *Journal of Athletic Training* for this field. This was an obvious candidate for a source journal, being the official, peer-reviewed publication of NATA, the primary professional organization for athletic trainers. Selecting additional source journals proved more challenging and required a multipronged approach. The journal list for athletic training in the CINAHL database included six titles at the time this study began. Sample searches on relevant topics were performed in CINAHL, and the relative frequency of contributing journals was noted. WorldCat and Ulrich's Periodicals Directory were searched for journal titles in athletic training. The online catalogs at the authors' respective libraries were searched for journal holdings in athletic training, followed by a manual review of recent issues. Textbooks for athletic training programs were scanned for discussion of prominent journals. An informal survey of academic athletic trainers was conducted via several electronic distribution lists, and the replies were analyzed. Sample copies of potential source journals not readily available to the authors were requested from publishers for manual review.

Three journals were identified by the authors that fit the above criteria for a source journal: the *Journal of Athletic Training, Athletic Therapy Today,* and the *Journal of Sport Rehabilitation. Athletic Therapy Today,* published since 1966 by Human Kinetics, is a peer-reviewed publication focused on providing practical information to sports health care providers. The *Journal of Sport Rehabilitation,* launched in 1992 and also published by Human Kinetics, provides peer-reviewed articles on the latest research in the rehabilitation of sport and exercise injuries.

A database was created containing all cited references from all articles, including editorials and review articles, in the three source journals from the years 2002, 2003, and 2004. An Internet-accessible database, created by the Information Technology Department at Norwich University, enabled real-time, remote entry by both authors through a secure uniform resource lo-

Table 1
Cited format types by source journal and total frequency

	Source journal							
	Athletic Therapy Today		*Journal of Athletic Training*		*Journal of Sport Rehabilitation*		Totals	
Cited format type	No.	%	No.	%	No.	%	No.	%
Journal articles	1,414	71.7	5,267	83.4	1,997	84.4	8,678	81.4
Government publications	20	1.0	78	1.2	4	0.2	102	1.0
Books	451	22.9	756	12.0	342	14.5	1,549	14.5
Websites (nongovernmental)	72	3.6	78	1.2	6	0.2	156	1.5
Miscellaneous	15	0.8	141	2.2	16	0.7	172	1.6
Total	1,972	100.0	6,320	100.0	2,365	100.0	10,657	100.0

cator (URL). The creator of this Web application used a combination of hypertext markup language (HTML), Javascript, and the server-side scripting language PHP in conjunction with MySQL to store the data on a separate server. Collected data points included source journal, volume, issue, year, article number, reference number, format of cited reference or journal title for journals, and year of cited reference. References were placed into one of five format categories and ranked hierarchically: journals, government documents (including federal and state laws), books, Internet-based resources, and miscellaneous materials. The miscellaneous category included unpublished reports, theses, dissertations, NATA guidelines, conference proceedings, poster presentations, interviews, emails, and other items. References that fit the description of more than one format were placed in the higher-ranking category.

The authors entered the data over the course of twelve months, working independently at their respective locations. Final tabulation of results and creation of the accompanying tables was accomplished through simple manipulation of the various reports by either author, regardless of geographic location. The database tallied the number of citations from each journal title, ranking them in descending order according to frequency of citation. Numbers for journals experiencing title changes were collected under the title in use at the end of 2004.

A cursory glance at the raw data revealed that a large portion of the journal citations originated from a strikingly small number of journal titles. Conversely, the vast majority of the remaining citations were to titles that were cited much less frequently, many of them only once in the entire three years of collected data. Bradford's Law of Scattering [16] describes this phenomenon. According to this law, for any given discipline, the total number of journal citations can be divided into three approximately equal portions or ''zones,'' whereby the journals in the first zone are responsible for the bulk of citations and can be considered the ''core'' journal titles for that field. Journals in the second zone are important but considerably less central, and journals in the third zone are relatively peripheral and only occasionally produce articles relevant to the discipline under review.

The final step was to determine the extent of indexing coverage by the primary indexing services. This step was critical for it provided an indication of how readily accessible the relevant literature would be to the potential reader. Three databases were selected: MEDLINE, produced by the US National Library of Medicine; CINAHL, a primary database for nursing and the health sciences; and SPORTDiscus, a sports-specific database widely used by coaches and sports health care professionals. The degree of indexing coverage was indicated by assigning a score on a scale of 1 to 5, with 5 representing 95% to 100% coverage, 4 representing 75% to 94%, 3 representing 50% to 74%, 2 representing 25% to 49%, 1 representing 1% to 24%, and 0 representing less than 1% coverage.

RESULTS

A total of 10,657 references were cited by 438 articles in the 3 source journals in 2002, 2003, and 2004. The *Journal of Athletic Training,* a quarterly publication, had the greatest number of citations at 6,320, for 59.3% of the total. The *Journal of Sport Rehabilitation,* also a quarterly publication, contributed 2,365 citations, for 22.2% of the total. *Athletic Therapy Today,* published 6 times a year, added 1,972 citations, for 18.5% of the total. The *Journal of Athletic Training* had 165 articles in the 3-year period, for an average of 38.3 citations per article. The *Journal of Sport Rehabilitation* had 80 articles in the same time frame, for an average of 29.6 citations per article, and *Athletic Therapy Today* had 193 articles, for 10.1 citations per article.

The distribution of citations among the 5 format types is shown in Table 1. The bulk (81.4%; 8,678/10,657) of the references from the 3 source journals were to journal articles, with books constituting 14.5% (1,549/10,657) of the citations, leaving the remaining 4.1% (430/10,657) to be divided among the other 3 formats. *Athletic Therapy Today* had notably different citation patterns than the other 2 journals. The *Journal of Athletic Training* had 83.3% (5,267/6,320) of the citations coming from journal articles and 12.0% (756/6,320) from books, and the *Journal of Sport Rehabilitation* had a similar breakdown with 84.4% (1,997/2,365) from journal articles and 14.5% (342/2,365) from books. In contrast, 71.7% (1,414/1,972) of the citations in *Athletic Therapy Today* came from journal articles and 22.9% (451/1,972) from books. However, it should be noted that as a publication, *Athletic Therapy Today* evolved substantially over the 3-year study period.

Table 2
Cited format types by publication year periods

Publication year (range)	Cited format type											
	Journal articles		Government documents		Books		Internet (nongovernmental)		Miscellaneous		All formats	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2000–2005*	1,478	17.0	54	52.9	311	20.1	136	87.2	46	26.7	2,025	19.0
1995–1999	2,718	31.3	6	5.9	515	33.2	20	12.8	77	44.8	3,336	31.3
1990–1994	1,885	21.7	12	11.8	371	23.9	0	0	28	16.3	2,296	21.5
1980–1989	1,802	20.8	13	12.8	248	16.0	0	0	14	8.1	2,077	19.5
1970–1979	507	5.9	11	10.8	69	4.5	0	0	4	2.3	591	5.6
1960–1969	199	2.3	3	2.9	15	1.0	0	0	1	0.6	218	2.0
Pre-1960	89	1.0	3	2.9	20	1.3	0	0	2	1.2	114	1.1
Total	8,678	100.0	102	100.0	1,549	100.0	156	100.0	172	100.0	10,657	100.0

* Includes in press materials

The total number of citations increased from 496 in 2002 to 826 in 2004, with a concomitant increase in the number of citations to journal articles from 69% to 75%.

The currency of the cited material is displayed in Table 2. Using the year ranges of pre-1960, 1960 to 1969, 1970 to 1979, 1980 to 1989, 1990 to 1994, 1995 to 1999, and 2000 to 2005 including in press materials, it is evident that the vast majority (91.3%; 9,734/10,657) of the cited literature was from the previous 25 years, with 50.3% (5,361/10,657) from the past decade. Relatively few citations were dated 1979 or earlier, and an exceptionally small number of references were to material dating from earlier than 1960. Correlating format with currency, it is no surprise that use of Internet-based resources was negligible prior to 1995 but experienced a nearly 7-fold increase from the 1995-to-1999 year range to the 2000-to-2005 year range. The use of government documents had an even greater proportionate increase, with the number of citations jumping from 6 in 1995 to 1999 to 54 in 2000 to 2005.

A total of 8,678 references were to journal articles published in 1,080 unique journal titles. By sorting the journal titles in decreasing order of citation frequency, it was immediately evident that a small number of journal titles contributed the majority of citations. By applying Bradford's Law of Scattering, 3 zones of journal titles were created, each contributing approximately equal numbers of citations, as depicted in Table 3. Only 6 journals were required to produce the 1st zone, scarcely 0.6% of the total number of cited journal titles. In contrast, 40 journals (3.7%) were required to produce the 2nd zone and 1,034 journals (95.7%) were required to produce the final zone. The 6 titles in Zone 1, in descending order of frequency of citation, were the *American Journal of Sports Medicine,* the *Journal of Athletic Training,* the *Journal of Orthopaedic and Sports Physical Therapy, Medicine and Science in Sports and Exercise, Physical Therapy,* and the *Journal of Sport Rehabilitation.* These 6 titles constituted the core journal titles for the field of athletic training.

Table 3
Distribution by zone of cited journals and references

Zone	Cited journals		Cited journal references		Cumulative total
	No.	%	No.	%	
1	6	0.6	2,993	34.5	2,993
2	40	3.7	2,831	32.6	5,824
3	1,034	95.7	2,854	32.9	8,678
Total	1,080	100.0	8,678	100.0	8,678

Finally, the distribution and indexing coverage of the journals in Zones 1 and 2 by 3 primary bibliographic databases—CINAHL, MEDLINE, and SPORTDiscus—were analyzed. As shown in Table 4, CINAHL provided the most comprehensive coverage. For the core journal titles represented by Zone 1, CINAHL provided 95% to 100% coverage of all 6 titles. MEDLINE scored equally well for 3 of the 6 titles but had lower scores for 2 of the titles and provided no indexing coverage for 1 of the core titles, also a source journal. While SPORTDiscus gained a higher overall score for the Zone 1 titles than MEDLINE, its indexing coverage was complete for only 2 of the 6 titles.

MEDLINE provided the best overall coverage of the forty journal titles in Zone 2, although it provided no coverage at all for six titles. CINAHL followed in terms of overall score, providing some degree of coverage for twenty-seven of the titles. SPORTDiscus provided some coverage for twenty-four of the titles, although its overall score was the lowest of the tested databases.

DISCUSSION

The literature of athletic training was found to rely heavily on the journal article, which accounted for more than 81% (8,678/10,657) of the total citations, with books as the next largest category at a far distant 14.5% (1,549/10,657). Over half of the total citations were to materials published in the last 10 years, while a relatively small percentage of materials older than 25 years were cited. The use of government documents in the 2000-to-2005 time period dramatically increased, no doubt driven by the widespread availability of government-issued materials via the Internet.

The nature of the journal titles in Zones 1 and 2 clearly indicates that the source of knowledge for this burgeoning field derives heavily from sports medicine, physical therapy, orthopedics, and physiology. General

Table 4
Distribution and indexing coverage in 2005 of cited journals in Zones 1 and 2

Cited journal	# of citations	CINAHL	MEDLINE	SPORTDISCUS
Zone 1				
1 Am J Sports Med	793	5	5	3
2. J Athl Train	710	5	5	4
3. J Orthop Sports Phys Ther	578	5	4	5
4. Med Sci Sports Exerc	424	5	5	4
5. Phys Ther	270	5	4	3
6. J Sport Rehabil	218	5	0	5
Zone 2				
7. Arch Phys Med Rehabil	212	5	5	3
8. J Bone Joint Surg Am	195	2	5	0
9. Clin Orthop	174	1	5	0
10. Physician Sportsmed	158	5	0	3
11. Sports Med	134	5	5	5
12. J Appl Physio	124	1	5	1
13. Clin Sports Med	121	5	4	4
14. Int J Sports Med	118	0	5	3
15. Foot Ankle Int	109	2	5	4
16. J Bone Joint Surg Br	108	2	5	0
17. Br J Sports Med	99	4	4	0
18. Clin J Sport Med	83	5	4	4
19. JAMA	67	3	5	1
20. Eur J Appl Physiol	64	0	5	2
21. J Biomech	62	0	5	1
22. Spine	62	2	5	0
23. J Physiol	62	0	5	0
24. Athl Ther Today	58	5	0	2
25. Clin Biomech (Bristol, Avon)	54	2	5	2
26. Scand J Med Sci Sports	53	0	5	5
27. Acta Orthop Scand	52	2	5	0
28. Exp Brain Res	49	0	5	0
29. Res Q Exerc Sport	48	0	5	4
30. J Neurophysiol	47	0	5	0
31. J Orthop Res	46	0	5	0
32. Knee Surg Sports Traumatol Arthrosc	40	0	5	3
33. J Strength Cond Res	39	5	5	2
34. J Sports Med Phys Fitness	37	5	5	5
35. Int J Sport Nutr Exerc Metab	36	5	5	4
36. BMJ	33	2	5	0
37. Orthop Clin North Am	31	3	5	1
38. Am J Phys Med Rehabil	30	5	5	4
39. Strength and Conditioning	30	5	0	3
40. J Am Podiatr Med Assoc	30	2	5	0
41. J Appl Biomech	29	5	0	0
42. Physiotherapy	28	5	0	0
43. J Shoulder Elbow Surg	28	0	5	0
44. J Appl Sport Psychol	27	0	0	5
45. Pain	27	0	5	0
46. Scand J Rehabil Med	27	4	5	1
Total indexing coverage score		127	190	96

Indexing coverage scale: 5 (95%–100%); 4 (75%–94%); 3 (50%–74%); 2 (25%–49%); 1 (1%–24%); 0 (< 1%).

interest medical publications such as *JAMA* and *BMJ* ranked in the middle of Zone 2, pointing to the somewhat narrow focus of this field. The top-ranking journal, the *American Journal of Sport Medicine,* far outscored the lowest-ranking Zone 1 journal by more than three times, reflecting the heavy influence of this particular publication. The high rank of the *Journal of Athletic Training* as the second-most heavily cited title might reflect both the increasing maturity of the profession and the pivotal role the profession's central publication has played in disseminating research in the field. Two of the three source journals ranked in Zone 1, while the third ranked in the middle of Zone 2.

The evolution of the source journal *Athletic Therapy Today* is worth noting. Its dramatic increase in the total number of citations and concomitant increase in the proportion of journal citations over the course of the three years may be a sign of diminished reliance on secondary and tertiary forms of literature and increased usage of the primary literature. If the study were repeated in a few years, it is possible that its citation pattern will approach that of the other two source journals.

CONCLUSION

This study followed the methodology developed specifically for the Mapping the Literature of Allied Health Project [2]. As with the previous studies in this series, the primary limitation of this study lay in selecting source journals, because that factor dictated the body of citations analyzed. Besides the three journals selected as source journals, the authors were not aware of any other publications that met the stated criteria for a source journal.

This study indicates that the field of athletic training

draws heavily from the literature of several closely related disciplines. Athletic trainers seeking to remain abreast of trends in the field should focus their scan of the literature on those journals in Zone 1 and to a lesser degree those in Zone 2. Because this study identifies the core journal titles for the entire discipline, individual practitioners may find that the ranking of the journals differs from their own list of favorites.

Librarians employed in college and university settings can use these data to make wise journal and database purchasing decisions. In an era of dwindling budgets and skyrocketing journal prices, they can now identify those journals that are most critical to this field, thereby maximizing their institutions' purchasing power. Reference librarians can use the data to direct patrons to the core journal titles in the field for browsing and current awareness. Comprehensive literature searches performed by librarians or end users should be performed in multiple databases to cover the largest number of relevant publications. Librarians serving as liaisons to academic departments and campus sports therapy clinics can provide advice to faculty and students on which publications are most critical to their research and practice.

Database producers can use the information from this study to increase coverage of core athletic training journal titles that are currently either not indexed or are indexed only selectively. CINAHL could increase its level of indexing of the titles in Zone 2 to more comprehensively serve the field. MEDLINE does well in covering the titles that are central to medicine but could improve its indexing of titles specific to athletic training. SPORTDiscus could improve its good but somewhat spotty coverage, perhaps by focusing on improving its use of controlled vocabulary.

While the findings of this study, like the others in the NAHRS Mapping the Literature of Allied Health Project, are vital to health sciences librarians, they are perhaps of greater value to the practitioners in the individual disciplines studied. The open access policy of the *Journal of the Medical Library Association* and the ever-improving access to the biomedical literature via PubMed combine to ensure that these findings will make their way into the hands of those who need them most, the health care professionals themselves.

ACKNOWLEDGMENTS

The authors thank Barbara F. Schloman, AHIP, for spearheading this project and Jamie Pratt of the Information Technology department at Norwich University for his expertise in creating the Web database.

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Received May 2006; accepted November 2006