

MEDLINE rocks, but so does CINAHL: An analysis of four sports medicine-related databases

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Introduction

One of the most critical aspects of librarianship is the development and maintenance of library collections. Included in these tasks is the continual need to evaluate the diverse collection of books, periodicals, reference materials, online resources, and electronic databases available to library patrons. The evaluation of resources such as electronic databases is particularly critical where budgetary decisions are concerned. As Tyler states, "in the current climate of rising prices and shrinking library budgets, many, if not most academic libraries have been forced to prune their collections of journals, indexes, and electronic databases" (2005). In order to make educated, thoughtful decisions about database subscriptions, librarians must carefully analyze the database available using quantitative methods to determine overall quality and instances of overlap in journal coverage.

Because Indiana University has recently added a graduate program in the Sports Medicine, it is especially important that the collections in this field of study be evaluated. In order to ensure that the needs of graduate students and faculty in the department could be met by the library resources, the libraries conducted an evaluation of electronic databases in sports medicine. In addition to providing quantitative data, which could help the librarians make database subscription decisions, the data collected in this study has the potential to assist the university in recruiting high quality faculty members and students, as well as achieving program accreditation.

Methods

Four sports medicine-related databases were evaluated in this study: The Cumulative Index to Nursing & Allied Health (CINAHL), Physical Education Index (PE), SPORTDiscus (SD), and Medline. Although two of the databases – CINAHL and

Medline – offer more general coverage in the health sciences (including sports medicine) they were deemed relevant to the study. By evaluating two general health sciences databases along with two subject specific databases, it was hoped that distinctly different coverage patterns would emerge and clearly define the best database(s) in terms of quality journal coverage.

A list of the 44 most highly cited journal titles in which sports medicine-related articles are published was provided by Lokman Meho who performed a Magical Mystery Search in Dialog to generate this list (Table 1). Using ISI's Journal Citation Reports, we then ranked each of the titles by impact factor. Citation impact factor calculates the rate of citation for a particular title and provides a quantifiable way to measure journal quality. According to Blessinger and Olle, it is "considered a valid measure of journal quality because frequency of citation implies scholarly acceptance" (2004). However, citation impact factor cannot determine why a particular work has been cited, and could include negative citations. Additionally, this method of

Table 1. Journal titles used for evaluating four sports medicine-related databases. Data provided by Lokman Meho.

Journal title	ISSN
Acta Orthopaedica	1745-3674
Acta Physiologica	1748-1708
American Journal of Physical Medicine & Rehabilitation	0894-9115
American Journal of Physiology	0363-6119
American Journal of Sports Medicine	0363-5465
Archives of Physical Medicine & Rehabilitation	0003-9993
Arthroscopy	0749-8063
BMJ	0959-8146
British Journal of Sports Medicine	0306-3674
Circulation	0009-7322
Clinical Biomechanics	0268-0033
Clinical Journal of Sport Medicine	1050-642X
Clinical Orthopaedics & Related Research	0009-921X
Clinics in Sports Medicine	0278-5919
European Journal of Applied Physiology	1439-6319
Exercise & Sport Sciences Reviews	0091-6331
Experimental Brain Research	0014-4819
International Journal of Sports Medicine	0172-4622
JAMA	0098-7484
Journal of Applied Physiology	8750-7587
Journal of Biomechanics	0021-9290
Journal of Bone & Joint Surgery: American Volume	0021-9355
Journal of Bone & Joint Surgery: British Volume	0301-620X
Journal of Clinical Investigation	0021-9738
Journal of Neurophysiology	0022-3077
Journal of Orthopaedic & Sports Physical Therapy	0190-6011
Journal of Orthopaedic Research	0736-0266
Journal of Physiology	0022-3751
Journal of Sports Medicine & Physical Fitness	0022-4707
Journal of Sports Sciences	0264-0414
Journal of Strength & Conditioning Research	1064-8011
Knee Surgery, Sports Traumatology, Arthroscopy	0942-2056
Lancet	0140-6736
Medicine & Science in Sports & Exercise	0195-9131
Muscle & Nerve	0148-639X
Nature: international weekly journal of science	0028-0836
New Engl& Journal of Medicine	0028-4793
Physical Therapy	0031-9023
Physician & Sportsmedicine	0091-3847
Research Quarterly for Exercise & Sport	0270-1367
Scandinavian Journal of Medicine & Science in Sports	0905-7188
Science	0036-8075
Spine	0362-2436
Sports Medicine	0112-1642

evaluation does not consider factors such as the user interface of the databases, full-text options, or the date range of journal title coverage. Nonetheless, it is a valid, well-established collection evaluation measure (Nisonger, 2004).

By searching the journal titles in Ulrich's Periodical Index, we assessed whether or not each title was indexed in each of the four databases of interest. Data were recorded as present/absent. Journal title occurrences were tabulated to create a picture of title coverage in each database. Additionally, we examined the top ten ranking journals in the field by citation impact factor and calculated an average impact factor ranking for each of the four databases using this method. Citation rankings were applied using ISI's Journal Citation Reports as well as Web of Science. Both sources were used in order to provide richer data that may offer insight into the field of Sports Sciences as well as the database coverage of the titles. We examined the total number of listed journals indexed, the total impact factor, the average impact factor, and the median impact factor of each database.

Results and Discussion

Three databases (CINAHL; PE; SD) indexed just over half (23 ± 2) of 44 possible titles whereas Medline indexed all but two titles. (see Table 2).

Table 2. Number of journals indexed in and total, average, and median impact factors of four sports databases.

	CINAHL	PE	SD	MEDLINE
Number of journals indexed	24	25	21	42
Total impact factor	122.8	69.07	36.51	259.3
Average impact factor	5.117	2.763	1.738	6.175
Median impact factor	1.716	1.697	1.672	2.352

Although it indexed only 4 additional titles, the total impact factor of PE was twice as high as SD. Similarly, CINAHL indexed one fewer title than PE yet had a total impact factor almost 54 points higher than PE; (the range of total impact factors across the four databases spanned approximately 223 points). On average, MEDLINE indexed higher ranked journals than the other three databases. It is important to note, however, that CINAHL had a much higher average impact factor than PE or SD despite the fact it indexed approximately the same number of journals. Consistent with its greater number of indexed journals as well as their overall higher impact factors, the median impact factor for the journals indexed in MEDLINE was higher than the median impact factors of the other three databases (2.352 vs. 1.672-1.716; see Table 2).

The data reveal that Medline offers significantly more journal indexing coverage in the field of sports sciences and has a much higher total impact factor score than the other three databases of interest in this study. However, as

mentioned earlier, Medline is not a sports medicine-specific database. It indexes general science and biomedical journals which have enormous impact factors (Table 3). These journals, although meritorious when considering impact factor, may not be relevant to the sports medicine discipline. We conducted an additional analysis of sports medicine publications in Web of Science. Using the subject search "sports

medicine" we identified a list of 1,431 articles published in the field of sports medicine. Analysis by publication title reveals an entirely different list of important journal titles (see Table 4). When the databases were evaluated for indexing of these ten

Table 3. Top 10 journals ranked by impact factor (IF) as reported by ISI Journal Citation Reports

Top 10 Journals Ranked by JCR	IF	CINAHL	PE	SD	MEDLINE
New England Journal of Medicine	44	✓			✓
Science	31				✓
Nature	29				✓
Lancet	24				✓
JAMA	23	✓	✓		✓
Journal of Clinical Investigation	15				✓
Circulation	12	✓			✓
BMJ	9	✓			✓
Journal of Physiology	4				✓
Journal of Neurophysiology	3				✓
Total		4	1	0	10

journals, all four databases performed equally. (It should be noted that two new titles appeared among the journals containing the most frequently cited papers. These titles were not provided by Lokman Meho in the original analysis. We can only speculate as to why these titles were not provided.

The results of this study indicate the importance of journal titles when analyzing databases. In our original analysis, we used impact factor alone to evaluate the databases; Medline far out-indexed and out-covered the competing databases. However, when evaluating the databases using journals which frequently

Table 4. Top 10 journals in which sports medicine articles are published as reported by Web of Science. Data are presented as percent of 1,431 articles. *Titles were not included in original data provided for analyses.

Top 10 Journals in Web of Science	%	CINAHL	PE	SD	MEDLINE
American Journal of Sports Medicine	19	✓	✓	✓	✓
British Journal of Sports Medicine	8	✓	✓	✓	✓
Physician and Sports Medicine	8	✓	✓	✓	
Medicine & Science in Sports & Exercise	6	✓	✓	✓	✓
Clinical Journal of Sport Medicine	6	✓	✓	✓	✓
Journal of Athletic Training*	5	-	-	-	-
Sports Medicine	4	✓	✓	✓	✓
Journal of Science & Medicine in Sport*	4	-	-	-	-
Clinics in Sports Medicine	4	✓	✓	✓	✓
Archives of Physical Medicine & Rehabilitation	3	✓		✓	✓
Total		8	7	8	7

publish articles relevant to the field, an entirely different picture arises: all four databases fare equally.

Specifically, we find that CINAHL offers high quality journal indexing of sports sciences titles, though not as comprehensive as that of Medline. The disparity of journal indexing both in quantity and quality between the two general health sciences and the highly specific sports sciences databases should not be discounted. Medline and CINAHL provide journal indexing for a wide range of health sciences fields, which indicates value across many academic disciplines. However, Medline is an especially cost-effective database, as it is offered free of charge via PubMed. This is no small matter where collection budgets are concerned.

Without examining additional criteria, a sound selection or de-selection decision cannot be made solely using these data. Before adding or canceling any of the databases, it would be prudent to take supplementary measures. Revelatory data could be collected by examining subscription cost, date coverage, indexing comprehensiveness, full-text options, archiving, or user-interface in each of the databases. For example, by briefly looking at the databases we discovered that SD indexes from 1830 – present, includes dissertations and websites, and provides coverage in fields such as dance, recreation & park administration, and water science (see Table 5). These factors may make it unique enough to warrant continued subscription, despite its relatively low ranking coverage in the sports sciences.

Conclusion

In examining the data collected in this study, it is apparent that further study is necessary to make a decision whether or not to subscribe to any of the specific databases. Using journal title quality measures, such as the checklist method and citation impact factor rankings can reveal a great deal about a database, but should not be used as the only basis for evaluation. These measures do not reveal whether a database is valuable to a different field, how easy it is to search, or whether it offers more extensive coverage (i.e., date coverage, comprehensive indexing) than another database. Thus, this study could be expanded to include usability measures, full-text availability, and comprehensiveness. Usability testing could involve focus groups and user surveys which would provide qualitative data to combine with the quantitative measures already taken. As stewards of library resources, it is essential that librarians consider user needs and behavior in addition to quantitative measures

when evaluating databases. A high quality database may lose value if library patrons are unable to navigate a difficult interface.

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Table 5. Descriptions, dates of coverage, holdings, and subject coverage of four sports medicine databases. Data collected from vendors' websites.

Database	Descriptions from database website	Coverage	Holdings	Subject coverage from database website
SPORTDiscus	SPORTDiscus is a comprehensive, international database of sport, fitness, and related literature written since 1800. It contains over 600,000 records based on more than 2,000 international sources, including citations to journal articles, books, conference proceedings, dissertations, and websites.	1830 - present	660,000+	<ul style="list-style-type: none"> • Applied Health Science • Dance • Health, Physical Education & Recreation • Kinesiology • Medicine • Psychology • Recreation & Park Administration • Underwater Science
CINAHL	CINAHL® Plus with Full Text is a comprehensive source of full text for nursing & allied health journals, providing full text for more than 560 journals indexed in CINAHL. Of those, nearly 400 have cover-to-cover indexing in CINAHL, and of those, more than 230 are not available with full text from any other EBSCO database. This authoritative file contains full text for many of the most used journals in the CINAHL index - with no embargo.	1937 - present	600,000+	<p>(Allied health disciplines only)</p> <ul style="list-style-type: none"> • Athletic Training • Medical/Laboratory Technology • Radiologic Technology • Audiology • Medical Assisting • Respiratory Therapy • Cardiopulmonary • Technology • Nutrition & Dietetics • Social Service in Health Care • Dental Hygiene • Occupational Therapy • Speech-Language Pathology • Emergency Services • Physical Therapy and Rehabilitation • Surgical Technology • Health Information Management • Physician Assistants
PE Index	PE Index offers access to the periodical literature of physical education, sports, recreation, and athletics. Articles are from peer-reviewed journals, report literature, conference proceedings, trade magazines, the popular press, and other sources.	1970 - present	274,985+	<ul style="list-style-type: none"> • Administration • Biomechanics-Kinesiology • Coaching • Curriculum • Dance • Facilities • Health • History • Law • Measurement-Evaluation • Motor Learning • Patents (pertaining to sport equipment) • Perception • Philosophy • Physical Education, fitness • Physical Therapy • Recreation • Research • Sport Activities • Sport Psychology, sociology • Sports • Sports Medicine • Teaching Methods • Training
MEDLINE	MEDLINE is the NLM's premier bibliographic database covering the fields of medicine, nursing, dentistry, veterinary medicine, the health care system, and the preclinical sciences. MEDLINE contains bibliographic citations and author abstracts from more than 4,800 biomedical journals published in the United States and 70 other countries. Coverage is worldwide, but most records are from English-language sources or have English abstracts.	~1965 - present	14 million +	<ul style="list-style-type: none"> • 22,997 MeSH descriptors • 151,000+ Supplementary Concept Records • 112,012 cross-reference entry points