ISSN : 0974-8520

PubMed

AYU

An International Quarterly Journal of Research in Ayurveda

Website : www.ayujournal.org

Vol 36 / Issue 3 / Jul-Sep 2015

Publication of
INSTITUTE FOR POST GRADUATE TEACHING AND RESEARCH IN AYURVEDA
Gujarat Ayurved University, Jamnagar, India

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Access this article online
Website: www.ayujournal.org
DOI: 10.4103/0974-8520.182754
Quick Response Code:

Review Article

Literature searches on Ayurveda: An update

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Abstract

Introduction: The journals that publish on Ayurveda are increasingly indexed by popular medical databases in recent years. However, many Eastern journals are not indexed biomedical journal databases such as PubMed. Literature searches for Ayurveda continue to be challenging due to the nonavailability of active, unbiased dedicated databases for Ayurvedic literature. In 2010, authors identified 46 databases that can be used for systematic search of Ayurvedic papers and theses. This update reviewed our previous recommendation and identified current and relevant databases. **Aims:** To update on Ayurveda literature search and strategy to retrieve maximum publications. **Methods:** Author used psoriasis as an example to search previously listed databases and identify new. The population, intervention, control, and outcome table included keywords related to psoriasis and Ayurvedic terminologies for skin diseases. Current citation update status, search results, and search options of previous databases were assessed. Eight search strategies were developed. Hundred and five journals, both biomedical and Ayurveda, which publish on Ayurveda, were identified. Variability in databases was explored to identify bias in journal citation. **Results:** Five among 46 databases are now relevant – AYUSH research portal, Annotated Bibliography of Indian Medicine, Digital Helpline for Ayurveda Research Articles (DHARA), PubMed, and Directory of Open Access Journals. Search options in these databases are not uniform, and only PubMed allows complex search strategy. "The Researches in Ayurveda" and "Ayurvedic Research Database" (ARD) are important grey resources for hand searching. About 44/105 (41.5%) journals publishing Ayurvedic studies are not indexed in any database. Only 11/105 (10.4%) exclusive Ayurveda journals are indexed in PubMed. **Conclusion:** AYUSH research portal and DHARA are two major portals after 2010. It is mandatory to search PubMed and four other databases because all five carry citations from different groups of journals. The hand searching is important to identify Ayurveda publications that are not indexed elsewhere. Availability information of citations in Ayurveda libraries from National Union Catalogue of Scientific Serials in India if regularly updated will improve the efficacy of hand searching. A grey database (ARD) contains unpublished PG/Ph.D. theses. The AYUSH portal, DHARA (funded by Ministry of AYUSH), and ARD should be merged to form single larger database to limit Ayurveda literature searches.

Key words: Complementary and alternative medicine, integrative medicine, library science, psoriasis, search engine, systematic review

Introduction

Literature searches for articles on Ayurveda continue to throw challenges, albeit Indian journals that publish on Ayurveda and other traditional Indian Systems of Medicine are increasingly indexed by popular medical databases. Previous work on systematic search for Ayurvedic papers and thesis identified 46 databases.[1] In 2010, it was concluded that Ayurvedic

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How to cite this article: Aggithaya MG, Narahari SR. Literature searches on Ayurveda: An update. Ayu 2015;36:238-53.

articles were scattered and just 33 Ayurvedic journals published regularly either in print or electronically.[2] Recently, biomedical journals also began publishing articles on Ayurveda and the number of exclusive Ayurveda journals increased. Currently, there are new and more comprehensive databases for traditional medicine. This paper is an update on Ayurveda literature search and its strategy to retrieve maximum publications.

Methods

The study was conducted using psoriasis as an example and limited to publications in English language. However, the word psoriasis does not appear in the glossary of Ayurveda. *Kusta* is the general term used for skin diseases. The search was not restricted to any type of studies or published year. Since there are very few randomized controlled trials (RCTs) available for Ayurveda, our search was extended to all types of study designs. Author adopted the methodology of our previous publication and improved on search for Ayurvedic literature.

Search question

Before conducting a search for relevant articles, the research questions were structured, that might yield maximum Ayurveda papers on psoriasis from traditional medicine and biomedical journals. The search focused on all types of interventions primarily because of the no/less availability of relevant articles and absence of options for narrowing the search terms in databases except in PubMed. A population, intervention, control, and outcome (PICO) table including all the words related to psoriasis and *Kusta* was developed [Table 1].[1] *Kusta* is the terminology used to describe 18 types of skin diseases. Among them, *Kitibha* and *Eka* resemble chronic plaque psoriasis, *Mandala* similar to guttate psoriasis and *vipadika* for palmo plantar psoriasis.[3] By keeping in mind the possibility of the different clinical subsets as inclusion criteria of clinical trial, the keyword *Kusta* which is a hyponym, rather than mentioning the 18 types of skin diseases separately was added. The different spellings used for *Kusta* (*Kusta/Kustha/kushta/kushtha*) were added to keywords list. Dr. Duke's Phytochemical and Ethnobotanical Databases[4] were searched to find out the medicinal plants used for psoriasis, *Dravyaguna Vijnana*,[5] (a textbook on compilation of herbs used in Ayurveda), to identify the vernacular names and the database of medicinal plants[6] for identifying different spellings for Sanskrit names of medicinal plants in English. For example, the drug *Acacia catechu* Linn. is *Khadira* which is also spelt as *khadirah* in English. The scoring systems used for psoriasis,[7] the quality of life (QoL) tools in psoriasis,[8] and general QoL tools used for dermatology[9] were used as outcome measures.

Search strategy

The 46 databases listed in previous work were searched by author.[1] The databases were categorized under Indian databases, Complementary and Alternative Medicine (CAM) databases, biomedical databases, Open access databases, clinical trial registries, and grey literature databases. We searched Google[10] and PubMed to identify new bibliographic databases using keyword, ayurved* AND bibliographic database. Author also searched Boehm *et al*., 2010,[11] and contacted other research organizations[12] to identify any new Ayurveda databases. The current relevance of databases was determined based on the update status, search results, and journals cited and if they have updated the search options. Those databases which did not cite the clinical trials related to Ayurveda and the subsets of larger databases were considered irrelevant for the search strategy. For example, CAM on PubMed is the subset of PubMed, which lists the information available in PubMed. Current relevance of all 46 databases listed in our previous publication was re-evaluated [Table 2].

A list of 105 journals publishing on Ayurveda was prepared by referring the international catalog of Ayurvedic publications[2] and a portal on systematic reviews in Ayurveda.[13] These journals were searched in the databases which cite Ayurveda research publications. Annotated Bibliography of Indian Medicine (ABIM) and Directory of Open Access Journals (DOAJ) have no option for searching based on journals. AYUSH research portal and Digital Helpline for Ayurveda Research Articles (DHARA) have separate option for journal search. PubMed search is done using [jou] as suffix for journal name.

The 46 databases listed in previous work were searched by author. National Union Catalogue of Scientific Serials in India (NUCSSI)[14] was searched to identify the journals not indexed in any bibliographic databases. Using psoriasis as the keyword, the following databases were searched - the researches in Ayurveda-A classified directory of all India PG and PhD thesis of Ayurveda,[15] Ayurvedic research database (5th ed., Institute of Post Graduate Teaching and Research in Ayurveda, Jamnagar, India), a CD-ROM containing full text version of Ayurvedic theses of Institute of Post Graduate Teaching and Research in Ayurveda, Jamnagar, National Institute of Ayurveda, Jaipur, and Digital Library initiative, Rajiv Gandhi University of Health Sciences, Karnataka, for postgraduate and postdoctoral theses.[1]

Results

Only 5 databases among 46 listed in 2010[1] are now relevant [Table 3]. In open access databases, DOAJ is beneficial to search for Ayurvedic literature. There were two new open access initiatives in Ayurveda funded by the Ministry of AYUSH, Government of India, DHARA,[16] and AYUSH research portal.[17] AYUSH research portal cites bibliographic information of 19,839 articles. Among them, 13,656 articles are related to Ayurveda, Yoga and Naturopathy, (1396), Unani (2020), Siddha (607), and Homeopathy (2160) systems of medicine. DHARA had bibliographic information of 54,389 articles from 4476 journals and cited 13 journals related to Ayurveda and 129 journals not indexed in PubMed. ABIM contains more than 50,000 citations. In total, ABIM, DHARA, and AYUSH research portal contained maximum Ayurveda publications. PubMed cites the bibliographic information of Ayurvedic articles published in biomedical journals; DOAJ has 4 Ayurvedic journals which are not cited in other 4 databases and 14 journals which are not indexed in PubMed [Table 4].

Eight search terms were developed for searching the above five databases for relevant publications [Table 5]. The number of articles retrieved by the search term psoriasis and ayur* [#3 of Table 5] are ABIM (62), DHARA (46), AYUSH research portal (83), PubMed (21), and DOAJ (11). The journals and the articles cited in each databases for "Psoriasis and ayur*" are listed and compared for the purpose of the relevance

Table 1: Population, intervention, control, and outcome table for psoriasis containing keywords of Ayurveda and biomedicine

Population	Intervention	Comparison	Outcome
Kusta/ Kustha/ Kushta/ Kushtha	Herb*	Shamana/Samana	Psoriasis scoring systems PASI, PGA, PSS, modified PASI, evaluation for prognosis with averaged PASI, Salford psoriasis index, SAPASI, nail psoriasis severity index, psoriasis disability index
Psoriasis	Indigenous	Abies grandis, Andira araroba, Arctium lappa, Carica papaya, Cassia alata, Cassia tora, Cicca acida MERR, Cinnamomum verum, Crotalaria juncea, Daphnopsis brasiliensis, Desmodium umbellatum, Dipterocarpus turbinatus, Gynocardia odorata, Hydnocarpus kurzii, Juniperus oxycedrus, Leucas aspera, Limnanthemum peltatum, Linum perenne, Melaleuca leucadendron, Microglossa afzelii, Momordica charantia, Morus alba, Musa paradisiaca, Myrica rubra, Nerium indicum, Nerium oleander, Oryza sativa, Pinus contorta, Piper longum, Psoralea corylifolia, Rauvolfia vomitoria, Rehmannia glutinosa, Sambucus canadensis, Sambucus nigra, Sambucus thunbergiana, Saussurea spicatus, Securidaca longipedunculata, Semecarpus anacardium, Spilanthes calva, Spilanthes paniculata, Taxodium mucronatum, Thespesia populnea, Tribulus terrestris, Urechites suberecta, Vernonia cinerea, Withania somnifera, Acacia catechu, Terminalia chebula, Emblica officinale, Curcuma longa, Alstonia scholaris, Cassia fistula, Embelia ribes, Jasminum grandiflorum	Psoriasis QoL tools NHP, SF-36, SIP, DQOLS, DSQL, Skindex-29
	Ayu*	Acacia catechu, Terminalia chebula, Emblica officinale, Curcuma longa, Semecarpus anacardium, Alstonia scholaris, Cassia fistula, Nerium indicum, Embelia ribes, Jasminum grandiflorum	Dermatology quality of life tool DLQI, GHQ12, Goldberg GHQ-28, the ISDL
	Sodhana/Shodhana	khadira, khadirah	
	Pancakarma/ Panchakarma	abhaya, haritaki, pathya, suddha, bhishak-priya, vayastha, amritha, haimavathi, vijaya, jivanthi	
	Vamana	dhatriphala, amalakam, adiphala, akara, amalaka, shriphala, amalaki, amamalakam, vayastha, amlika, amraphala, dhatri	
	Virechana/Virecana	rajani, nisa, nisha, gauri, varnavat, haridra, haridrakam	
	Basti/Basthi	agnimukhi, arushkara, aruskara, aruskarah, bhallatah, bhallataka, bhallatakah, bhallatamu	
	Rakta moksana/ Rakta mokshana/ Raktha moksana/ Raktha mokshana	saptaparna, saptaparnah, visaltvak, brihattvaka, brihatvaka	
	Emesis	nripadruma, nrpadrma, aragvadha, aragvhada, aragvadha, aragvadhah, aragwadhah, arakvadam, kritamala, kritamalaka, krtamala, krtamalah, krtamalaka, rajavraksha, rajavriksha, rajavrksa, rajavrksah, suvarnaka	
	Purgation	karavira, sveta pushpa, sweta pushpa, asvamaraka, ashvamaraka, ashwamaraka	
	Enema	vidanga, vidangah, vidangam, vrishanashana, vrishanasana, vrisanashana, vrisanasana, vrushanashana, vrushanasana, chitratandula, citratandula, janthunashana	
	Blood letting	Jati, Jathi	
	Nasya		

Contd...

Table 1: Contd...

Population	Intervention	Comparison	Outcome
	Sirovirecana/ Siro virechana Shirovirecana/ Shirovirechana		

PASI: Psoriasis area severity index, PGA: Physician global assessment, PSS: Psoriasis severity scale, SAPASI: Self-administered psoriasis area severity index, NHP: Nottingham health profile, SIP: Sickness impact profile, DQOLS: Dermatology quality of life scale, DSQL: Dermatology-specific quality of life instrument, DLQI: Dermatology life quality index, GHQ12: General Health Questionnaire-12, GHQ-28: General Health Questionnaire-28, ISDL: Impact of chronic skin disease on daily life, QoL: Quality of life

Table 2: The current status and relevance of the databases listed in Narahari *et al*. (2010) for searching clinical studies of Ayurveda

Number	Databases listed in Narahari *et al*. 2010	Relevance	Reasons
A	Indian databases		
1	Indian Medicine Database (ABIM) http://indianmedicine.eldoc.ub.rug.nl/	Relevant	ABIM contains more than 50,000 items related to Ayurveda
2	CCRAS http://ccras.nic.in/Publications/20081015_bibliographyMain.htm	Not relevant	This is a funding agency website, which has archives of two major journals of Ayurveda, Journal of Research in Ayurvedic Sciences, and Journal of Drug Research in Ayurvedic Sciences, published by CCRAS from 1980 to 2010. The archives are not updated from 2010. The publications of JRAS and JDRAS are now cited in new databases AYUSH research portal and DHARA
3	IndMED http://indmed.nic.in/	Not relevant	IndMED is not updated regularly. Previously, it had bibliographic information of more than 200 journals. Now it is reduced to 60 (when assessed in August 2014)
4	NISCAIR http://www.niscair.res.in/	Not relevant	No information specific to Ayurveda clinical research is currently available. Indian Journal of Traditional Knowledge, an interdisciplinary periodical of NISCAIR and CSIR listed in this database is also cited in other relevant data sets – ABIM, AYUSH research portal, and DOAJ
5	MEDKNOW http://www.medknow.com/	Not relevant	The search option is very simple. It is impossible to get accurate search. The journals are linked from DOAJ and PubMed through LinkOut An option to search each journal is present with information on its indexing in chemical abstracts, EMBASE, PubMed, Science citation index, SCOPUS
6	CSIR http://www.csir.res.in/	Not relevant	Clinical data are not available. This database has link to TKDL, which has information on different formulations
7	ICMR http://www.icmr.nic.in/	Not relevant	Clinical data are not available. This website has archives of Indian Journal for Medical research published by ICMR (cited in PubMed)
8	NML http://www.nml.nic.in/	Not relevant	NML database is to find out the holding data in library and no data available are confined to Ayurveda There is an option for Medical thesis Search of Different Medical Colleges in India which is not updated
9	TKDL (http://www.tkdl.res.in/tkdl/langdefault/common/home.asp?GL = Eng)	Not relevant	Clinical data are not available. This is a representative database containing 1200 formulations selected from various classical texts of Ayurveda, Unani, and Siddha systems of medicine. 500 formulations from Ayurveda, 500 formulations from Unani, and 200 Siddha formulations are readily available. The purpose of the database is to protect traditional medicine of Ayurveda from patenting by individual scientists
10	IBIN www.ibin.co.in/	Not available	
11	FRLHT Encyclopedia of Indian Medicinal Plants www.medicinalplants.in	Not relevant	Clinical data are not available

Contd...

Table 2: Contd...

Number	Databases listed in Narahari *et al*. 2010	Relevance	Reasons
12	NHIC www.nhicindia.org/	Not relevant	Clinical data are not available
B	CAM databases		
13	IBIDS http://grande.nal.usda.gov/ibids/index.php	Not relevant	PubMed subset
14	CAM on PubMed http://www.ncbi.nlm.nih.gov/sites/entrez?db = pubmed&orig_db = PubMed&cmd_current = Limits&pmfilter_Subsets = Complementary%20Medicine	Not relevant	PubMed subset
15	HerbMed http://www.herbmed.org/	Not relevant	PubMed subset HerbMed has free access to 20 herbs, and HerbMed Pro has description of 241 herbs. However, the descriptions mainly include the PubMed references and monographs
16	CAM base http://cambase.dmz.uni-wh.de/opencam/start_en.html	Not relevant	Provide information about complementary health products and practices and provides information of PubMed
17	Bandolier http://www.jr2.ox.ac.uk/bandolier/index.html	Not relevant	Bandolier is a website about the use of evidence in health, healthcare, and medicine in the United Kingdom Not regularly updated
18	NCCAM http://nccam.nih.gov/	Not relevant	It provides information about complementary health products and practices and provides information on PubMed
19	Native American Ethno botany http://herb.umd.umich.edu/	Not relevant	This database provides information regarding food, drugs, dyes, and fibers of native american people derived from american plants The details of American plants are available
20	TEK * PAD http://ip.aaas.org/tekindex.nsf	Not relevant	Clinical data are not available. This database provides details of medicinal uses and patents related to a medicinal plant
21	China TCM Patent Database http://chmp.cnipr.cn/englishversion/help/help.html	Not relevant	This database focuses on Traditional Chinese Medicine
22	AGRICOLA http://agricola.nal.usda.gov/	Not relevant	Clinical data are not available. It retrieves contents of National Agricultural Library, USA, and focuses on Phase 2 studies
23	EthnobotDb http://www.ars-grin.gov/duke/ethnobot.html	Not relevant	It was last updated in March 1998. It is a US agricultural research database covering ethnobotanical uses for plants
24	Acubriefs http://www.acubriefs.com/	Not available	Acubriefs is now a blog database of references on acupuncture in English (http://acubriefs.blogspot.in/)
25	Datadiwan http://www.datadiwan.de/index_e.htm (English version) http://www.datadiwan.de/(German)	Not relevant	Mainly focuses on Chinese medicine
C	Biomedical databases		
26	PubMed http://www.ncbi.nlm.nih.gov/pubmed/	Relevant	9 Ayurveda journals are now indexed. Many biomedical journals also publish on Ayurveda
27	Cochrane Library http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOME	Not relevant	Cochrane databases focus on controlled clinical trials. Most of the articles related to Ayurveda are not cited since most of them are lower evidence level studies

Contd...

Table 2: Contd...

Number	Databases listed in Narahari *et al*. 2010	Relevance	Reasons
28	NLM Gateway Search http://gateway.nlm.nih.gov/gw/Cmd	Not relevant	The NLM Gateway, instead of providing the search option for 23 databases of NLM, is restricted to only one database, Meeting Abstracts, a new pilot project from the Lister Hill National Center for Biomedical Communications.
29	NLM databases http://www.nlm.nih.gov/	Not relevant	The clinical data of NLM are available through PubMed. No separate search strategy is needed
30	Journal of Negative Results in Biomedicine www.jnrbm.com/	Not relevant	Journal of Negative Results in Biomedicine is a PubMed extraction of results
D	Open access databases		
31	DOAJ http://www.doaj.org/	Relevant	This database has citations of some Ayurvedic journals which were not cited in other databases
32	Free Medical Journal http://www.freemedicaljournals.com/	Not relevant	4007 journals are listed in this database, and it has link to journal websites. It lists the 6 journals of CAM. It is not a bibliographic database and has no search option
33	Open Journal of Gate http://www.openj-gate.com/	Not relevant	Open Journal of Gate (http://www.openj-gate.com/) is a database of journal literature; it provides full-text access to 8194 open access Journals of Engineering. No Ayurveda journal is cited in this database
E	Clinical trial registries		
34	CTRI http://www.ctri.in: 8080/Clinicaltrials/trials_jsp/index.jsp	Not relevant	The information on ongoing/completed trials registered in this registry is available in ICTRP search portal
35	CenterWatch http://www.centerwatch.com/	Not relevant	Clinical data are not available. It is a leading source of clinical trials information for both clinical research professionals and patients
36	ClinicalTrials.gov http://clinicaltrials.gov/	Not relevant	The information on ongoing/completed trials registered in this registry is available in ICTRP search portal
37	CRISP http://crisp.cit.nih.gov/	Not available	The CRISP system at NIH has been replaced by the RePORTER query tool
F	Grey literature database		
38	Indian Patent Office www.patentoffice.nic.in/and http://ipindia.nic.in/	Not relevant	Clinical data are not available
39	USPTO http://www.uspto.gov/	Not relevant	Clinical data are not available
G	PG/Ph.D. theses databases		
40	NIA, Jaipur http://nia.nic.in/	Not relevant	Not updated
41	RGUHS, Karnataka www.rguhs.ac.in/	Not relevant	Not updated
H	Union catalogues		
42	Union Catalogue of Biomedical Serials in India http://uncat.nic.in/	Not available	
43	NUCSSI http://www.niscair.res.in/nucssi/	Not relevant	Clinical data are not available
44	IndCat http://indcat.inflibnet.ac.in/	Not relevant	Clinical data are not available
45	Union Catalogue of Health Science Journals in Eastern Mediterranean Region http://www.emro.who.int/his/unlist/SearchCnt.asp	Not relevant	Clinical data are not available

Contd...

Table 2: Contd...

Number	Databases listed in Narahari *et al.* 2010	Relevance	Reasons
46	WHO WorldCat http://www.worldcat.org/	Not relevant	Clinical data are not available

ABIM: Annotated Bibliography of Indian Medicine, CCRAS: Central Council for Research in Ayurvedic Sciences, JRAS: Journal of Research in Ayurveda and Siddha, JDRAS: Journal of Drug Research in Ayurveda and Siddha, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy, DHARA: Digital Helpline for Ayurveda Research Article, NISCAIR: National Institute of Science Communication and Information Resources, CSIR: Council of Scientific and Industrial Research, DOAJ: Directory of Open Access Journals, TKDL: Traditional Knowledge Digital Library, NML: National Medical Library, NLM: National Library of Medicine, CAM: Complementary and alternative medicine, ICTRP: International Clinical Trial Registry Platform, CRISP: Computer Retrieval of Information on Scientific Projects, NIH: National Institutes of Health, RePORTER: RePORT Expenditures and Results, ICMR: Indian Council of Medical Research, IBIN: Indian Bio-resource Information Network, FRLHT: Foundation of Revitalisation of Local Health Tradition, NHIC: National Health Information Collaboration, IBIDS: International Bibliographic Information of Dietary Supplements, NCCAM: National Centre for Complementary and Alternative Medicine, TEK * PAD: Traditional Ecological Knowledge Prior Art Database, DOAJ: Directory of Open Access Journals, CTRI: Clinical Trials Registry India, USPTO: United States Patent and Trademark Office, NIA: National Institute of Ayurveda, RGUHS: Rajiv Gandhi University of Health Sciences, NUCSSI: National Union Catalogue of Scientific Serials in India, WHO: World Health Organization

Table 3: The search strategy adopted for major databases citing Ayurveda publications

Databases	Search methods
AYUSH research portal http://ayushportal.ap.nic.in/Srch1.aspx AYUSH research portal contains the research data of Ayurveda, Yoga and Naturopathy, Unani, Siddha, Homeopathy along with AYUSH related research done by the allied sciences Ayurveda (10,684), Yoga and Naturopathy (1396) Unani (1945), Siddha (599), Homeopathy (2077), Sowa Rigpa (0), All (16701)	Simple Search, Search with AYUSH Terminology, Search in Article Title, Search in Author's Name, Search in Journal Name, Search in Institute\Department Select medical system The bibliographic information also is categorized under clinical research, preclinical research, drug research, and fundamental research
DHARA http://www.dharaonline.org/ The DHARA project is being implemented by AVT Institute for Advanced Research, the research wing of the Ayurvedic Trust, AVP Group of Institutions, Coimbatore, Tamil Nadu, India This database has bibliographic information of 4306 journals. There were 14 journals related to Ayurveda and 16 journals were not indexed in PubMed	Keyword search Type the keyword in the search field Advanced search The advanced search allows to control the search parameters by using the Boolean operators "and," "or," "not" etc., Restrict the search to specific fields like "Title," "Abstract," "Author" and "Journal." Search field tags Controlled vocabulary and limiting search
ABIM http://indianmedicine.eldoc.ub.rug.nl/ ABIM and EJIM was created by Roelf Barkhuis and the Digital Library team of the Groningen University Library, Netherlands ABIM: At present the bibliography contains > more than 50,000 items. A number of summaries of articles from various periodicals are included EJIM: The issues of the EJIM are published online regularly when sufficient, suitable material is available The articles of each volume will appear yearly in print and on the free website	Search for ABIM "*" functions as a substitute for a character sequence For example, place* sign at the end of a term to search for all terms that begin with that word; for instance Ayur* will find all terms that begin with the letters Ayur; e.g., Ayurveda, ayurvedic, etc. "?" is a substitute for one character For example: b?ll searches for ball, bell, bill, etc. Search for EJIM The search option is the same as the ABIM This journal is not periodically updated
PubMed http://www.ncbi.nlm.nih.gov/pubmed/ PubMed is a service of the U.S. NLM that includes over 18 million citations from MEDLINE and other life science journals for biomedical articles dating back to the 1950 s. PubMed includes links to full-text articles and other related resources. PubMed contains all citations from the medical literature back to 1953	Basic search First select with the databases in the drop down menu, select with PubMed. Then the next columns enter with the keyword, then go to the searches Advanced search In advance search the following characters are searches Search by Author, Journal, Publication Date, and more. Limit options are also available in advanced searches

Contd...

Table 3: Contd...

Databases	Search methods
PubMed is updated daily directly from publishers 90% of all MEDLINE searches are done in PubMed PubReader™ view of articles The PubReader view is an alternative web presentation that offers another, more reader-friendly way to look at articles in the PMC archive. It is designed particularly for enhancing readability on tablet and other small screen devices PubMed Mobile PubMed comprises >23 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites	Search by author Enter the author's name in the format of last name followed by initials. Omit punctuation Search by journal title Enter in the search box one of the following Full journal title (e.g., molecular biology of the cell) Title abbreviation (e.g., molecular biology of the cell) ISSN number, a standardized international code (e.g., 1059-1524) Search by date Enter dates using the format YYYY/MM/DD (date field). There is a selection of date fields to use Date of Publication (dp) Entrez Date (edat)-The date the citation first entered PubMed MeSH Date (mhda)-The date the citation was indexed with MeSH terms Limit Author and Journal, Full Text, Free Full Text, and Abstracts Published or Added to PubMed, Dates, Humans or Animals, Gender, Languages Subsets Journal groups and more subsets, Topics, PubMed Central Subset, Citation Status Subsets, Ahead of Print Citations, Publication Types, Ages, Tag Terms
DOAJ http://www.doaj.org/ DOAJ is a service that provides access to quality controlled Open Access Journals. This hosts 3501 journals and 1195 journals are searchable at article level. Totally, 193,514 articles are included in the DOAJ service This open access database is hosted by Lund University, Sweden and supported by EBSCO Information Services, international network INASP and national library of Sweden DOAJ is funded by Open Society Institute, SPARC, SPARC Europe, BIBSAM, and Axiell DOAJ has 9911 journals, and 5593 journals are searchable at article level. In total, 1,516,253 articles from 121 countries are cited	Journals can be accessed through clicking the 'find journals' button. This will allow the users to search by entering suitable subjects and keyword entered in search column. Then go to find journals Browse by title It provides all the listed journals in this website, and it can be browsed by alphabetical options Expand subject tree It is the subject wise search option Find article This search option is to search the articles. There are two search columns in this search option. The Boolean operators AND, OR and NOT options are included in this search option. Another box provided in this search contains Title, Journal title, ISSN, Author, Keyword and Abstract searches The options to limit are: All fields, Title, Keywords, Subject, Identifier (DOI, ISSN), Abstract, Author, Year, Country, Language, Publisher, Journal title, Alternative title, and Provider

ABIM: Annotated Bibliography of Indian Medicine, EJIM: Electronic Journal of Indian Medicine, ISSN: International Standard Serial Number, DOI: Digital object identifier, DOAJ: Directory of Open Access Journals, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha & Homeopathy, DHARA: Digital Helpline for Ayurveda Research Articles, ABIM: Annotated Bibliography of Indian Medicine, NLM: National Library of Medicine

and variability in citations [Figure 1]. There was variability in citations of each journal. For example, three databases cited them differently for "Journal of Research in Ayurveda and Siddha (JRAS)" – ABIM (11), DHARA (3), and AYUSH research portal (12). PubMed and DOAJ did not retrieve any articles. Although the journal "Ancient science of life" is cited in DOAJ, it did not yield the articles related with #3 [Figure 1]. Among 105 journals of Ayurveda, 43 (40%) are not indexed in any databases [Figure 2].

Search options for ABIM, DHARA, AYUSH research portal, and DOAJ are not uniform. ABIM allows simple search and does not support Boolean operators as in PubMed. It also displays the article names differently, for example, "Efficacy of \'sa\'s\=a\.nkalekhayoga on psoriasis" instead of "Efficacy of sasankalekhayoga on psoriasis." AYUSH research portal has no option to use Boolean operators. However, it has an option for limiting the search into Ayurveda, Siddha, Homeopathy, Yoga, Unani, and Sowa Rigpa (called Amchi or Tibetan Medicine). AYUSH research portal showed 143 articles for "psoriasis" [Table 4]— Ayurveda (83), Yoga (9), Homeopathy (8), Siddha (19), and Unani medicine (16). When search was limited to "clinical research" under "Ayurveda" subcategory, 50 articles were listed. Six of them had evidence Grade B (evidence Levels IIa, b, and III) and 44 of evidence level C (evidence Level IV).[18] DHARA also focused on journals which are not listed in PubMed as well as those listed in PubMed. Of 881 journals, 14 are related to Ayurveda and 15 journals are not indexed in PubMed. DHARA did not support search string with multiple Boolean operators.

Table 4: PubMed indexed popular journals publishing on Ayurveda

Journal	Regularity	Impact factor	Open access	Submission fee	Processing/ publication fee
Ancient Science of Life[a] http://www.ancientscienceoflife.org/	Regular	No	Yes	No	No
AYU[a] http://www.ayujournal.org/	Regular	No	Yes	No	No
Journal of Ayurveda and Integrative Medicine[a] http://www.jaim.in/	Regular	No	Yes	No	No
Journal of Traditional and Complementary Medicine http://www.jtcm.org/	Regular	No	Yes	No	No
Journal of Evidence-Based CAM[b] http://chp.sagepub.com/	Regular	0.200	No	No[c]	No
Planta medica https://www.thieme.de/de/planta-medica/journal-information-4809.htm	Regular	2.35	No	No[c]	No
European Journal of Medicinal Plants http://www.sciencedomain.org/journal-home.php?id=13	Regular	No	Yes	No	Yes
Planta http://link.springer.com/journal/425	Regular	3.715	Yes	No	Yes
Phytomedicine: International journal of phytotherapy and phytopharmacology http://www.sciencedirect.com/science/journal/09447113	Regular	2.877	Optional	No	Yes
Evidence based CAM http://www.hindawi.com/journals/ecam/	Regular	2.175	Yes	No	Yes
BMC CAM http://www.biomedcentral.com/bmccomplementalternmed	Regular	1.88	Yes	No	Yes
Journal of Alternative and Complementary Medicine http://www.liebertpub.com/overview/journal-of-alternative-and-complementary-medicine-the/26/	Regular	1.518	Optional	Yes	No
International Journal of Ayurveda Research[a,d] http://www.ijaronline.com/	Not regular	No	Yes	No	No
Bulletin of the Indian Institute of History of Medicine[a]	Not regular	No	No	No	No
Journal of Research and Education in Indian Medicine[a]	Not regular	No	No	No	No
Sachitra Ayurved[a,d]	Not regular	No	No	No	No
The Antiseptic[d]	Not regular	No	No	No	No
The Journal of research in Indian medicine[a,d]	Not regular	No	No	No	No

[a]The journals included in NLM catalog: Journals referenced in the NCBI databases, which is exclusively for Ayurveda publications. This information obtained when searching NLM catalog using Ayurved* as keyword (9 journals). The information on the journal, "Bulletin of the Institute of History of Medicine (Hyderabad)" (ISSN: 0304-9566 (Print); 0304-9566 (Linking) listed in NLM catalog is not available elsewhere. So the journal was not added in this table, [b]Formerly Complementary Health Practice Review, [c]Processing charges apply for color images in the print version, [d]No recent publications. NLM: National Library of Medicine, CAM: Complementary and Alternative Medicine

Only PubMed allows complex search strategy, and all other databases are inferior in limiting yield. Around 30 articles were retrieved in PubMed while combining the botanical names with psoriasis (search term #5 of Table 5). The search using search term #5 of Table 5 was not performed in other four databases since they are not supporting complex search terms.

Computer Retrieval of Information on Scientific Projects (CRISP) listed in our previous paper is currently not available. Center Watch is not relevant for search of Ayurvedic trials. International Clinical Trial Registry Platform (ICTRP) search portal[19] provides access to a central database containing the trial registration data sets provided by important registries worldwide. No separate search is needed to identify trials in individual registries such as Clinical Trial Registry of India (CTRI) and clinicaltrials.gov. ICTRP search portal yielded for ayur*221 trial; among them, CTRI yielded 200 trials, ClinicalTrials.gov 15 trials, and SLCTR 6 trials. The independent search of CTRI yielded 323 trials for ayu*.

Google Scholar yielded about 5640 articles for ayur* or ayur, about 60,600 results when searching Ayurveda, and about 4560 results when searching with keyword, "psoriasis AND ayur*." The yield was very vague. World Intellectual Property Organization (WIPE)[20] is the collective information of 39 patent offices in which Intellectual Property India (IPI)[21] is not included. WIPE yielded 68 documents, and IPI yielded nine documents for the keyword - psoriasis AND Ayurveda. However, they were prior to journal publication information. It was difficult to identify the Ayurvedic conference abstracts in any grey databases.

Among 105 journals which publish Ayurvedic literature, 25 (23.6%) journals are online only. Author searched NUCSSI to identify the journals holdings data, and the information on 65 (61%) of 81 print journals was available [Table 5]. The

Table 5: The yield for search terms in five major databases for Ayurveda literature search

Databases	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8
1. Indian medicine database (ABIM)	64	-	3	0	0	0	0	0
2. DHARA	46			0	0	0	0	0
3. AYUSH research portal	134	0	0	0	0	0	0	0
4. PubMed	35,695	4115	21	37,681	30	30,720	2	2
5. DOAJ	1014	1695	7	0	0		0	0

1 = Psoriasis, # 2 = Ayur*, # 3=# 1 and # 2, # 4 = Abies grandis or Andira araroba or Arctium lappa or Carica papaya or Cassia alata or Cassia tora or Cicca acida MERR. or Cinnamomum verum or Crotalaria juncea or Daphnopsis brasiliensis or Desmodium umbellatum or Dipterocarpus turbinatus or Gynocardia odorata or Hydnocarpus kurzii or Juniperus oxycedrus or Leucas aspera or Limnanthemum peltatum or Linum perenne or Melaleuca leucadendron or Microglossa afzelii or Momordica charantia or Morus alba or Musa paradisiaca or Myrica rubra or Nerium indicum or Nerium oleander or Oryza sativa or Pinus contorta or Piper longum or Psoralea corylifolia or Rauvolfia vomitoria or Rehmannia glutinosa or Sambucus canadensis or Sambucus nigra or Sambucus thunbergiana or Saussurea spicatus or Securidaca longipedunculata or Semecarpus anacardium or Spilanthes calva or Spilanthes paniculata or Taxodium mucronatum or Thespesia populnea or Tribulus terrestris or Urechites suberecta or Vernonia cinerea or Withania somnifera or Acacia catechu or Terminalia chebula or Emblica officinale or Curcuma longa or Alstonia scholaris or Cassia fistula or Embelia ribes or Jasminum grandiflorum, # 5=# 1 and # 4, # 6 = Psoriasis area severity index or physician global assessment or psoriasis severity scale or modified PASI or evaluation for prognosis with averaged PASI or Salford psoriasis index, self-administered psoriasis area severity index or nail psoriasis severity index or psoriasis disability index or Nottingham Health Profile or Short Form Health Survey or Sickness Impact Profile or Dermatology Quality of Life Scales or Dermatology-Specific Quality of Life Instrument or Skindex-29 or Dermatology Life Quality Index or General Health Questionnaire-12 or Goldberg General Health Questionnaire or the impact of chronic skin disease on daily life, # 7=# 1 and # 4 and # 6, # 8=# 1 and # 2 and # 6. ABIM: Annotated Bibliography of Indian Medicine, DOAJ: Directory of Open Access Journals, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy, DHARA: Digital Helpline for Ayurveda Research Articles

researches in Ayurveda-A classified directory of all India PG and Ph.D. thesis of Ayurveda, Ayurvedic research database was regularly updated. However, the National Institute of Ayurveda, Jaipur, and Digital Library initiative, Rajiv Gandhi University of Health Sciences, Karnataka, were not updated from 2005.

Discussion

Among 46 databases identified by us in 2010, only 5 databases are currently relevant in searching for Ayurvedic papers. ABIM, DHARA, and AYUSH research portal contain exclusively Ayurveda journals and studies. PubMed and DOAJ are biomedical databases citing the bibliographic information of Ayurvedic articles published in biomedical journals. Latter two also list Ayurvedic journals that do not appear in exclusive Ayurveda databases. In Narahari *et al*., 2010, there were no databases exclusively for Ayurveda except ABIM, created by Jan Meulenbeld from the Netherlands. There were two new bibliographic databases for Ayurveda after 2010. It is mandatory to search all five databases because all carry citations from different groups of journals, and although cited, all databases did not cite all the articles of a journal. Only PubMed allows complex search strategy. The term psoriasis and ayur* (#3 of Table 5) retrieved articles in all databases, that is, ABIM (62), DHARA (46), AYUSH research portal (83), PubMed (21), and DOAJ (11) [Table 5]. The journal citations in each of the databases vary [Figure 1]. Among 105 Ayurveda journals, 43 (40%) are not indexed in any of the databases [Table 4]. Thirty articles were retrieved in PubMed while combining the botanical names used for psoriasis, as mentioned in ethnobotany and *Charaka Samhitha*, with psoriasis (#5 of Table 4). There was no difference in PubMed yield while botanical names were replaced by keyword "ayur*" (#3 of Table 5).

Search strategy

Well-structured research question guides many aspects of the review process, including determining eligibility criteria, searching for studies, collecting data from included studies, and presenting findings. The "clinical question" should specify types of population (participants), interventions (and comparisons), and outcomes that are of interest (PICO table). Narahari *et al*. discussed an ideal method of developing a structured questionnaire. This is essential for both clinical trials and systematic reviews in Ayurveda.[22] The PICO table should list the keywords thought to be helpful to search the publications that might have discussed the subject of research question. The criteria for considering population should be broad enough to identify diversified studies; albeit, sufficiently narrow to identify the studies relevant to the concerned research question. Age, gender, community, and setting of the patients of population are helpful to narrow the search in PubMed. Original descriptions of diseases in Ayurveda are written in Sanskrit. The name of the disease in Sanskrit language should be used for searching for papers. The synonymous words for disease name are identified and used (e.g., *kitibha kusta* or *kitibha*, *mandala kusta* or *mandala* in Ayurveda). The subtypes of the disease entity, if any, are also added as keywords. Since the disease name is written with different spellings in English, different spellings in use for the same word are also mentioned as keywords for our search. The biomedical disease comparable in signs and symptoms of Ayurveda disease entity should be considered (e.g. *kitibha kusta* correlated with plaque psoriasis, *mandala kusta* is synonymous with guttate psoriasis). The university degree curriculum in Ayurveda (graduate, postgraduate, and postdoctoral) includes many components from biomedicine.[23] Several Ayurveda medical colleges and symposia offer training in equivalent biomedical terminology. Numerous English translations of Ayurveda terminologies are published in India as continuing medical education articles, historical translations, or medical text books[3] although not supported by clinical studies. These could be referred as easy guide to select more keywords.

The intervention may be traditional formulation written for the disease in classical books of Ayurveda. The botanical names of the ingredients of the classical formulations should be considered for searching.[1] Single drug formulation should be considered for this section. The 10 general drugs used in the treatment of *Kusta*[24] [Table 1] are also added as intervention for psoriasis. *Charaka Samhitha* has listed 10 important herbs (*Agra Oushadha*) which are widely used for the treatment of skin diseases. The botanicals also searched through Dr. Duke's Phytochemical and Ethnobotanical Databases which is developed by James A. Duke, Fulton, Maryland. This database contains information on the activity of chemicals in plants, ethnobotanical uses for plants, and searchable by plant (scientific or common name), its

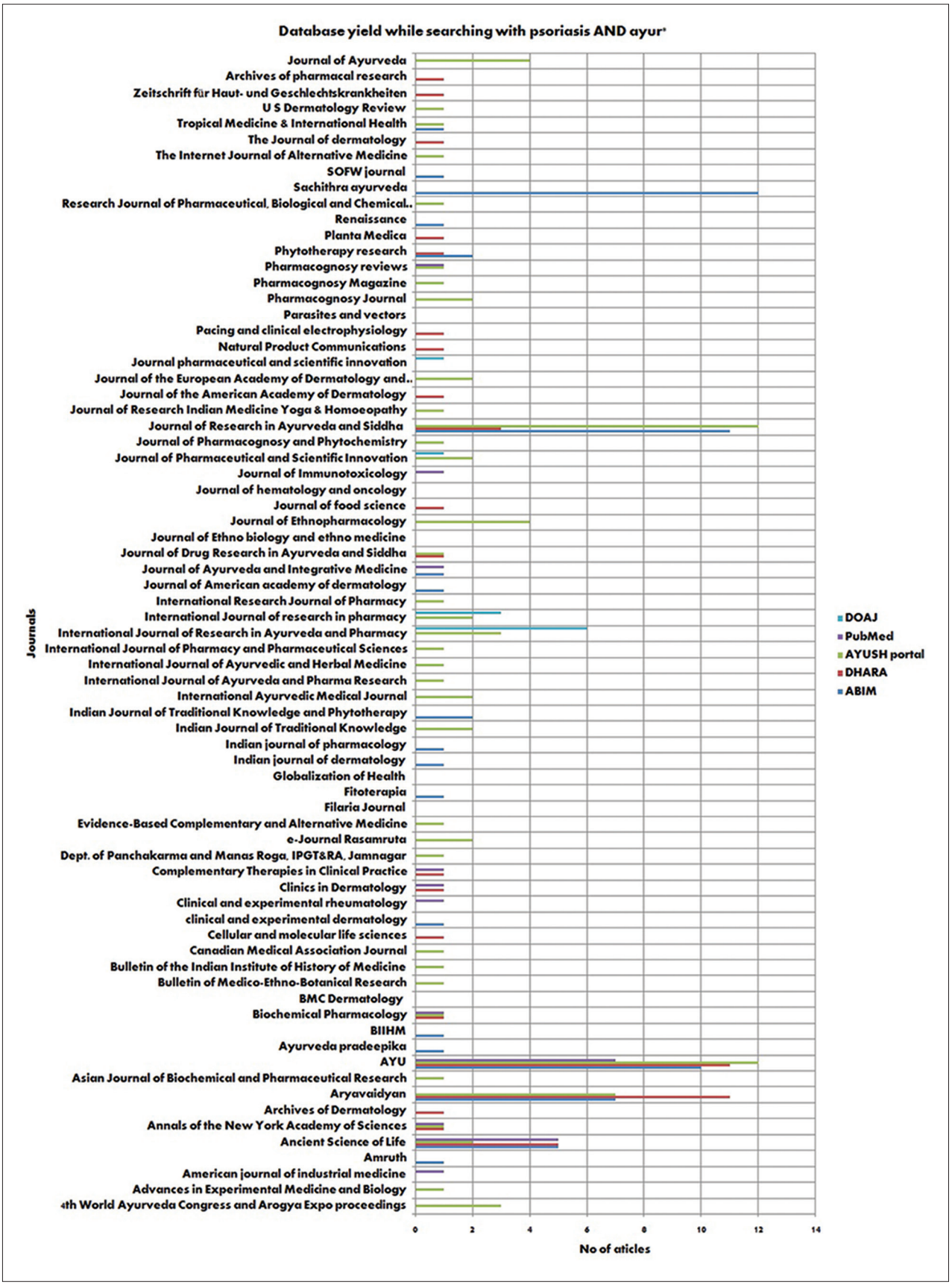

Figure 1: The yields from five databases while searching with "psoriasis AND ayur*"

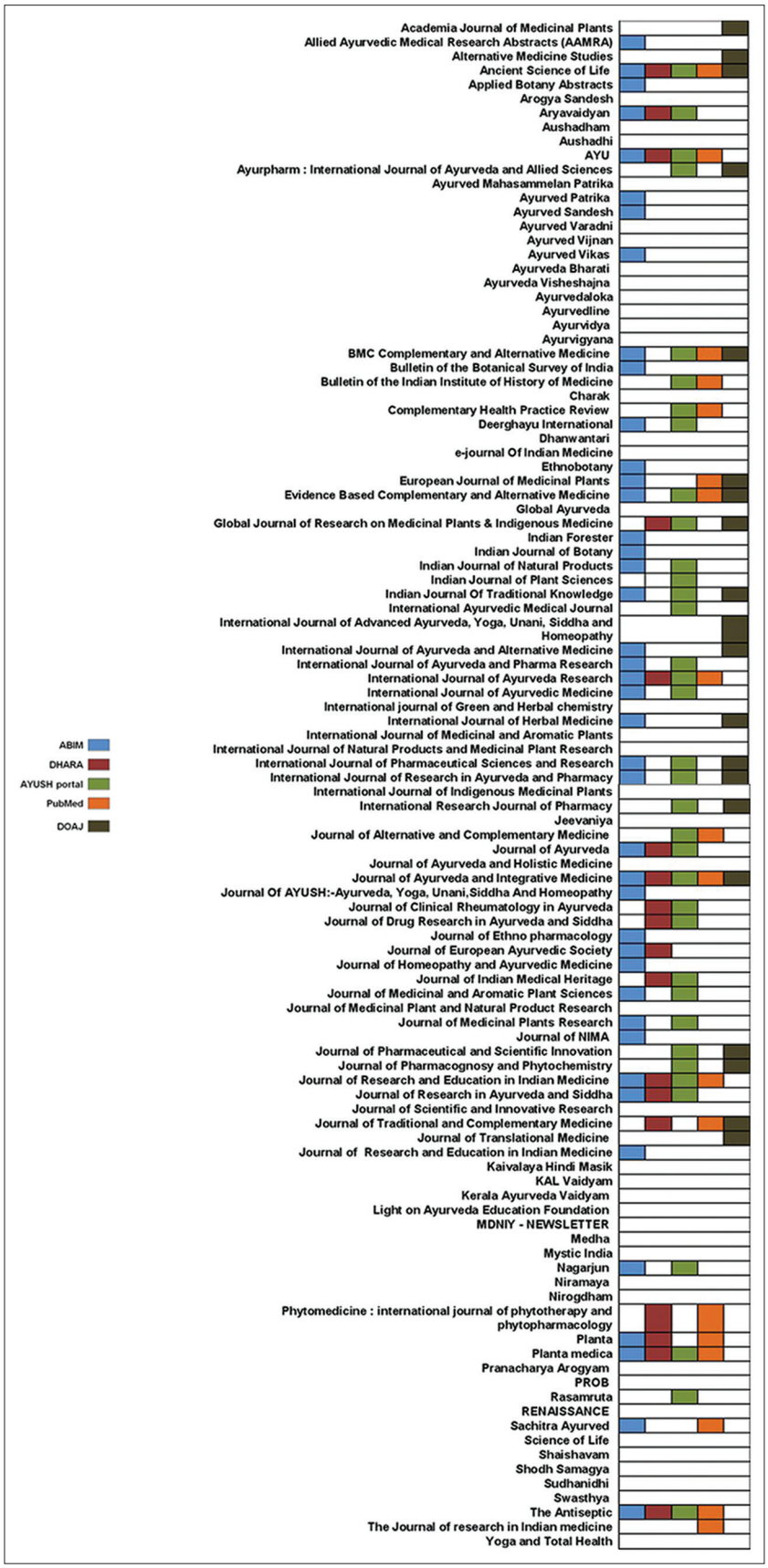

Figure 2: The journal citations of five bibliographic databases. Hundred and five journals, which publish Ayurveda research publications, were searched for citation relevance of databases

chemical ingredient, or activity.[4] Total 45 botanical names were found for psoriasis. They were used for inclusion in PICO. For broader search, terms such as herb*, indigenous, and Ayur* were used. Other important keywords used were from the therapeutics of Ayurveda such as *panchakarma* and *shodhana*. "Herbal" and "indigenous" are found in papers on phytomedicine and they too were included as keywords. The comparison may be classical formulation, active controlled, placebo controlled, or historical controlled. In search for articles related to vitiligo,[1] the comparative trials with 2–6 groups of intervention, pre- and post-intervention (case series), and case reports were found. Although there are increased trends of controlled clinical trials, comparative trials are mostly found.

The *Phalashruthi*, the expected benefit from a formulation of Ayurveda, is described in all classical textbooks. In PICO, author used them as outcome measures either as keyword or its comparable biomedical term or clinical description. Specific terminology for *phalashruthi* of vitiligo is *savarneekarana* (repigmentation similar to surrounding skin color).[25] However, there is no specific term used for psoriasis. This is because psoriasis is a comparable biomedical diagnosis of four different names of traditional Ayurveda literature. Different scales of biomedicine were included because Ayurvedic studies use them to show their effectiveness - for example, Psoriasis Area and Severity Index (PASI) score for psoriasis. In QoL tools, both disease specific health-related QoL tools were used to find out patient's QoL in our search.

As there is no option to restrict the search items, broader search terms were included. Only PubMed allows complex search application by combining multiple keywords in PICO manner. Other databases are not comprehensive to allow a complex search strategy. The keywords such as *Kusta/Kushta/Kustha* did not narrow the search to Ayurveda and psoriasis. For example, PubMed retrieved articles bearing author name "*Kusta*" for keyword *kusta* and author "*Kuchta*" instead of the keyword *Kushta*. PubMed retrieved articles of two different skin diseases mentioned in Ayurvedic literature when author used the search term #3 (Psoriasis AND Ayu*). They were *Eka* and *Mandala*. When author used *Kusta/Kushta/Kushtha* for search, all studies on psoriasis were not cited. This is because some article used keywords *Eka Kushtha* or *Ekakushtha* or *Ekkakushtha*. Hence, did not add *kusta* related keywords in search terms [Table 5]. It was difficult to narrow the search for relevant articles since the vernaculars are the same for multiple herbs. For example, *Haritaki* and *Amalaki* are also known as "*Vayastha*"(rejuvenate); *Amrutha* is also used for similar meaning (increased lifespan). Some papers used this name as an outcome measure (*phalashruthi*) due to its action. The change in spellings of vernacular names poses difficulty in searching. Another example is *C. fistula*. It is spelt as *Aragwadha*, *Aragvadha*, or *Aragvadah* in English. There are 18 variables for 6 vernacular names in Sanskrit for *C. fistula* [Table 1]. *Dravyaguna Vijnana* textbook was searched to identify the vernacular names and the database of medicinal plants[6] for identifying different spellings for Sanskrit names of medicinal plants in English. Author have searched these variables; however, six variables are found to be suitable for *Aragvadha* in PubMed.

When PubMed was searched using binary name of the species, it uses Boolean "AND" in between two words. For example, while searching *C. fistula*, PubMed searches Cassia AND fistula, that is, cassia (MeSH terms) OR cassia (all fields) AND fistula (all fields) OR Cassia fistula (all fields). The search yielded different species bearing Cassia; *Cassia italic*, *Cassia occidentalis*, *Cassia grandis*, and an author bearing the name "Cassia." Search on PubMed using 45 plants listed in Dr. Duke's Phytochemical and Ethnobotanical Database yielded 12 articles. The plants were *Cassia tora*, *Juniperus oxycedrus*, *Momordica charantia*, *Nerium indicum*, *Nerium olendar*, *Oryza sativa*, *Piper longum*, *Psoralea corylifolia*, *Rehmannia glutenosa*, *Sambucus canadensis*, and *Sambucus nigra*. While searching the 10 important herbs (*Agra Oushadha*) for skin diseases, as mentioned in *Charaka Samhitha*, *A. catechu*, *Curcuma longa*, *C. fistula*, and *N. indicum* yielded articles.

Electronic databases

The current relevance of previous 46 databases was determined based on the update status, search results, journals cited, and if they have updated the search options. Those databases which did not cite the clinical trials related with Ayurveda and the subsets of larger databases were termed as irrelevant for search. The databases were listed under six subcategories – Indian databases, CAM databases, biomedical databases, open access databases, clinical trial registries, and grey literature database. In Indian databases, one is relevant (ABIM) and one is not updated (IndMed) and other 14 databases were not relevant. Among 13 CAM databases listed previously, none was relevant. Four of five biomedical databases were not relevant. In open access databases, DOAJ is beneficial to search for Ayurvedic literature. There were two new databases, AYUSH research portal and DHARA; both were funded by the Ministry of AYUSH [Table 3]. While searching for both databases using psoriasis AND ayur*, AYUSH portal yielded 12 articles of JRAS, a journal published by the department hosting it. DHARA, a project funded by the Ministry of AYUSH but hosted by The Ayurvedic Trust, AVP Group of Institutions, Coimbatore (AVP), yielded three articles of the same journal. AYUSH portal yielded only two articles of Ancient Science of life which are published by AVP. All other databases yielded five articles of ancient science of life. National Institute of Science Communication and Information Resources (NISCAIR) has national science digital library which aims at providing comprehensive S and T information to students of science, engineering, and technology in India. There is one journal related to Ayurveda – Indian Journal of Traditional Knowledge (IJTK). This is an interdisciplinary periodical of NISCAIR and Council for Scientific and Industrial Research. IJTK is also cited in ABIM, AYUSH research portal, and DOAJ [Figure 1]. Hence, there is no need of separate searching of NISCAIR. Central Council for Research in Ayurvedic Sciences (CCRAS) had maximum yields when compared with other databases. CCRAS is funding research activities in Ayurveda and publishes "Journal of Research in Ayurveda and Siddha (JRAS)." JRAS had a maximum number of publications on vitiligo. However, JRAS publications are now cited in ABIM, AYUSH research portal, and DOAJ [Figure 1], so searching CCRAS separately is not needed. The archives of Indian Journal of Medical Research were available in Indian Council of Medical Research website, now it is cited in ABIM and AYUSH research portal partially and PubMed has cited IJMR publications from 1945. The CAM databases were either subsets of other databases or contained no information regarding clinical trials. Hence, they were considered irrelevant.

There are an increased number of articles related with Ayurveda since 18 journals of our list are indexed in PubMed [Table 4]. Eight (72%) journals among them are not regularly published. PubMed has 11 journals when searched using the keyword ayur* in journals database, 56 journals while searching with ayur* OR herb*. Cochrane library retrieved Cochrane reviews, other reviews, and clinical trials in separate sections. Cochrane library retrieved four articles for the search term psoriasis AND ayur*. Two articles of AYU journal were cited twice. No systematic reviews were done for psoriasis in Ayurveda. South Asian Database of Controlled Clinical Trials[26] did not retrieve any article related to Ayurveda.

In general, 'electronic only' Ayurveda journals are available for free and 'print only' journals are available on subscription. DOAJ was the only source where maximum Ayurveda journals were cited [Figure 2]. Grey literature databases were the main sources of locating the literature that is not formally published in journals. They include proceedings of scientific meetings, dissertations, and nonpeer reviewed journals. Approximately, 10% of the studies referenced in Cochrane systematic reviews are from grey literature.[27] Apart from published literature, Ayurvedic research information is mainly available on PG/PhD theses of different Ayurvedic institutions, conference proceedings, and blogs/other websites. It was difficult to identify the Ayurvedic conference abstracts in any grey databases. WIPE and IPI can be searched, and details would be obtained by contacting the investigator only. On searching Google Scholar the results were very vague. Clinical trial registries are important sources to retrieve ongoing studies along with the studies which are already completed. Clinical trial registries of India and Sri Lanka are the main sources to retrieve ongoing Ayurvedic trials. ICTRP search portal and a WHO owned search portal pool the results of 16 clinical trial registries worldwide. The trials registered in CTRI are updated on weekly basis. Apart from the clinical trial registries, ICTRP search portal retrieves trials registered in International Standard Randomized Controlled Trial Number (ISRCTN). The ISRCTN is a simple numeric system for the unique identification of RCTs and other forms of studies designed to assess the efficacy of health-care interventions worldwide.

Hand searching identifies studies in journals that may not have been indexed in any electronic database or may be indexed in such databases, where searching is impractical. Forty-four Ayurveda journals are not indexed in any bibliographic databases [Figure 2]. NUCSSI also not retrieved the journals not indexed in any bibliographic databases. Information on common paid CAM clinical journals is also not available in NUCCSI. This would pose challenge to Indian researchers to obtain the articles published in expensive CAM journals. The other major source of Ayurveda clinical data in India is the thesis works of postgraduate teaching departments. The National Institute of Ayurveda, Jaipur, and Digital Library initiative, Rajiv Gandhi University of Health Sciences, Karnataka, were not updated from 2005. Union Catalogue of Biomedical Serials in India (http://uncat.nic.in/) is not available now. IndCat citing theses of Banaras Hindu University is also not updated. This emphasizes the importance of hand searching, especially to identify Ayurveda publications. The information on few Ayurveda libraries is available in NUCSSI. There are Ayurveda colleges which have well-structured library with collection of printed journals which is not available elsewhere. Difficulty of hand searching in Ayurveda is explained in our previous paper. This is now made easier due to the constant effort of Prof. Baghel, Director of Institute for Postgraduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar. The researches in Ayurveda,[15] International Catalogue of Ayurvedic Publications,[2] compiled by Baghel, are the major sources to identify the research data which is not available electronically. Researches in Ayurveda have data on around 7700 thesis from all the postgraduate departments of Ayurveda colleges of India whereas International Catalogue of Ayurvedic Publications has over 4400 entries covering over 19 different subjects of Ayurveda. There is a new initiative "Researches in Ayurveda" a web edition of compiling 17,000 titles from more than 60 PG institutes of Ayurveda, from Prof. Baghel and Girish.[28] This website is launched recently. In recognition of his pioneering contribution toward hand searching even before electronic version became popular in India, the hand searching method is named as Baghel's hand searching.[1]

Conclusion

Comprehensive search is important before conducting research since it consolidates the evidence available on the same topic. Searching Ayurvedic databases continues to be difficult due to no options for searching complex search strings, poorly keyworded, and comprehensively not indexed, and existence of Ayurvedic literature outside electronic databases. Basic knowledge of Ayurveda and/or Sanskrit is an essential support to explore the complex Ayurvedic, Sanskrit terms used in study title and keywords. Author recommends medical subject headings for Ayurvedic literature. The listing of controlled vocabulary of Ayurveda search terms such as AYUSH tree (Ayurveda subject headings)[13] is essential to create a standard thesaurus in Ayurveda. Also the postgraduate/postdoctoral curriculum in India should include proper training on current research methodologies. Proper training is needed for investigators, peer reviewers, journal editors, and members of research funding committees in India to ensure that high-quality research is done, documented, and listed. Institutional repositories should be encouraged to document postdoctoral/postgraduate Ayurveda theses. Many journals are emerging in Ayurveda and some are cited in comprehensive databases such as PubMed. However, there are many journals with substandard articles, without the peer review process. Many other journals are author pay; the charges range from $175 to $250. This is huge money for Indian authors where maximum clinical studies on Ayurveda are conducted. This limits publishing in such international journals. The Government of India, Ministry of AYUSH, should manage the database program more effectively by merging all databases under it or funded by it and adding search options. This would save resource sufficient to manage the unified AYUSH portal professionally.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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हिन्दी सारांश

आयुर्वेद पर साहित्यिक शोध सामयीकरण

मधुर जी. अगिथ्य, सरवू आर. नरहरि

हाल के वर्षों मे बहुचर्चित आयुर्वेद पर प्रकाशित शोधपत्र चिकित्सकीय डाटाबेस में अनुक्रमित किये जाने लगे है। पर कई शोधपत्र अभी तक अनुक्रमित नही है जैसे कि झींलचशव, आयुर्वेद पर किये गये साहित्यिक शोध पूर्णतः समर्पित और निष्पक्ष, न होने के कारण पूर्णतः स्वीकार्य नही किये जाते है। वर्ष २०१० मे नरहरि व अन्य ने ४६ डाटाबेसस को पहचान की जिसका प्रयोग व्यक्तिगत तरीके से आयुर्वेदिक शोध मे किया जा सकता है। इसमे हमारे पिछले सुझावो का विश्लेषण किया गया तथा उचित डाटाबेसस की पहचान की गई। इस अध्यन का उद्देश्य आयुर्वेद साहित्यिक शोध का सामयीकरण तथा अधिकाधिक प्रकाशनों को सुधारने की रणनीति तैयार करना है। यहाँ सोरियासिस का उदाहरण लेकर पिछले डाटाबेसिस का अन्वेषण किया गया तथा नवीन डाटाबेसस की पहचान की गयी। यहाँ जनसंख्या, हस्तशोध, नियंत्रण तथा परिणाम सारणियों मेंसोरियासिस तथा अन्य त्वकविकारो में प्रयुक्त, विशिष्ट शब्दावली का प्रयोग हुआ है। पिछले डाटाबेस के वर्तमान उद्गरणो को नवीनतम स्थिति, खोज रणनीतियों को विकसित किया गया तथा १०५ ऐसे प्रकाशन जो कि आयुर्वेदीय शोध को प्रकाशित करते है उनकी पहचान की गयी। इस डाटाबेसिस में अस्थिरता खोजने का प्रयत्न किया गया जिसमे पूर्वग्रह या पक्षपात पाये। ४६ डाटाबेसिस मे से ५ डाटाबेस पाये गये – AYUSH Research portal, Annotated bibliography of Indian Medicine, Digital Helpline for Ayurveds Research Article (DHARA), PubMed, Directory of open access journals (DOAJ) इन डाटाबेसिस मे भी जटिल खोज की कार्यनीती केवल PubMed मे ही पायी गयी। The Researches in Ayurveda and Ayurvedic Research Database अन्वेषण के लिये महत्वपूर्ण तथा उपयुक्त संसाधन है। लगभग ४१.५% (४४/१०५) आयुर्वेदीय पत्रिका किसी भी डाटाबेसिस मे अनुक्रमित नही है। केवल १०.४ प्रतिशत (११/१०५) आयुर्वेदीय पत्रिकायें ही डाटाबेसिस में अनुक्रमित पायी गयी। २०१० के बाद आयुष (AYUSH Research portal) तथा धारा (DHARA) ही दो प्रवेशमार्ग प्रतीत होते है। PubMed तथा चार अन्य डाटाबेसिस मे अलग–अलग पत्रिकाओं में से हवाला मिलता है इसलिये इनका आवश्यक रूप से अन्वेषण होना चाहिये। वह आयुर्वेद के प्रकाशन जो कही अनुक्रमित नही है उनकी खोज होनी चाहिये। यदि Union catalogue of scienfific serial के अन्तर्गत आयुर्वेद के पुस्तकालयों में इन उद्गरणो की उपलब्धता की जानकारी मिल जाए तो निसंदेह संबंधित खोज प्रभावोत्पादकता में सुधार होगा। ARD मे अप्रकाशित PG/Ph.D. शोधकार्य निबंध मिलता है। आयुष (AYUSH), धारा (DHARA) तथा ARD को विलय कर एक डाटाबेस तैयार कर देना चाहिये जिससे आयुर्वेद साहित्य खोज हेतु सरलता हो।