Module Two - Searching Tools

Introduction

There are various searching tools available to health professionals in both print and electronic formats. These include, among others: Online Public Access Catalogues, indexes, search engines, gateways, databases, portals, subscribed journals, free electronic journals, and institutional repositories (IRs).One of the most used database in medicine and allied health is MEDLINE through PubMed. A brief overview of how these tools aid information retrieval is presented. This module provides content, examples and practical exercises for identifying searching tools.

Learning Outcomes

At the end of this module, you should be able to:-

- Define what a searching tool is.
- List searching tools available for medicine and allied professionals, both in print and electronic.
- Define search engine (and their types) and be able to use selected health oriented search engines.
- Identify and locate different health databases.
- Search MEDLINE/PubMed database
- Identify and use free health journals available over the Internet.
- Identify various searching tools used in the digital environment.

Module Content

|	Content	Methods	Mode of
2.4	Introduction to searching tools in the health sciences	Lecture	Q&A
2.5	Online search tools	Lab session	Training questions
2.6	Gateways	Lab session	As above
2.7	Health Databases	Lab session	As above
2.8	Health Portals	Lab session	As above
2.9	Free Medical Journals	Lab session	As above
2.10	Institutional Repositories	Lab session	As above
2.11	Overall Evaluation Exercises	Lab session	As above

Introduction to Searching Tools

In a traditional medical library some years ago, students were possibly attracted to the card catalogue which was a cabinet of book cards that were filed according to authors, subject and title. It was a formidable to retrieve journal articles if one did not have access to an abstracting or an indexing service. The Internet and specialized medical databases have ushered in a new generation of desktop searching tools that allow users to find information quickly across various sources. In this module, an overview of searching tools that are available to medical students is outlined and practical exercises are provided. There are tools that enable users to retrieve information in a library. These tools have been in existence over the years. The most widely used by students are the card catalogue, bibliographies, indexes, abstracts and indexing journals.

Library Catalogue

The library catalogue is a general tool for finding information. It will enable one to identify and locate books in the collection including reference sources and periodicals. The library catalogue could be a paper card catalog or a computerized catalogue, often referred to as OPAC (Online Public Access Catalogue)

Fig 1: An example of a card catalogue
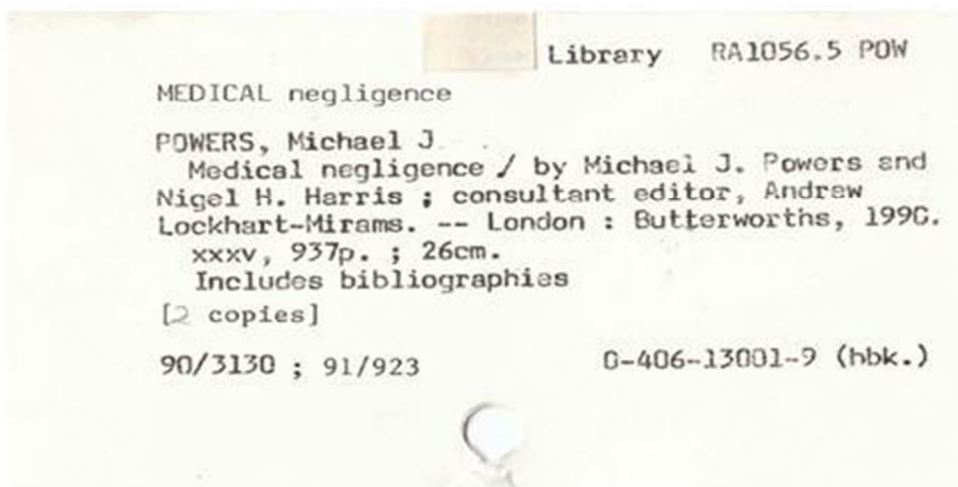
In most Universities the catalogue is computerized and searchable over the internet.

Fig 2: An example of Web OPAC page

http://www.itcompany.com/inforetriever/opac.htm

Indexes and Abstracting Journals

Indexes to periodical literature are guides to the contents of published periodicals providing references to articles that have been published primarily in medical journals and medical databases. A popular index for health sciences is the MEDLINE from the US National Library of Medicine. There are many other abstracting services available. CABI Health, Google Scholar and Current Content. Current Content, for example, are awareness services or databases that provides access to abstracts, table of contents and bibliographic information. They abstract articles in issues of leading scholarly journals, as well as more than 7000 relevant websites.

Online Searching Tools

Search Engines
A search engine is a program that searches documents for specified keywords and returns a list of documents where the keywords were found. On the World Wide Web, the search engine utilizes automated robots to gather information and automatically index sites. Any words found on the web pages visited by the search engine are stored in the search engine database. When you search the web for a topic, the key words are matched to the information found on the web pages visited by the search engine. There are many types of search engines available over the World Wide Web, however, below are some of the key features of search engines:-

- Allow natural language queries (i.e. what is H1N1?)
- Use of parenthesis to group terms
- Use of proximity searching
- Relevancy ranking of results.
- Number of search terms retrieved
- Number of times each search term occurs
- Location of search terms (title, text)
- Sub-searching (searching within retrieved records)
- Limiting documents by date, audio, video, language, etc.

Popularly Known Search Engines

The following is a list (the list is not exhaustive) of general search engines which are popularly known:-

- Google (www.google.com)
- Altavista (www.altavista.com)
- Lycos(www.lycos.com)
- Excite(www.excite.com)
- Fastsearch (www.alltheweb.com)
- Exalead (www.exalead.com)
- Hotbot(www.hotbot.com)
- InfoSeek Guide (www.inforseek.com)

Practical Session 1: Google –featured example of a search engine example of a search engine
Exercise 1

- Connect to the Internet and open your internet browser.
- Type in (or copy/paste) the url of Google - http://www.google.com - Click on "GO" or hit the Return key
- In Google search box, type HINARI and click Go
- A link to HINARI home page will be   top on the list of retrieved items

Exercise 2

- Search the following phrase: HIV developing countries:
- How many citations did you retrieve?
- What type of material is included in the first two pages of the search result?
- Type in (or copy/paste) the url of Google Scholar - http://scholar.google.com – Click on "GO" or hit the Return key
- Search the following keywords: HIV developing countries:
- How many citations did you retrieve?
- What types of material is included in the first two pages of the search?

Google page

http://www.google.com/

Search Results on a Google page

http://www.google.com/search?hl=en&source=hp&biw=1218&bih=871&q=hinari&btnG=Google+Search

Search Engines Designed For Health

The following is a selection of search engines designed for health professionals:-

- Omni Medical Search (www.omnimedicalsearch.com)

Omni Medical Search brings back search results from 30 different sources, and one can search up to 12 different medical search engines at one time. One can also search using a dropdown menu on the home page. In addition, Omni Medical Search has tabbed search options for more medical information: news, Images, and web2, which search only specific domains among four major search engines.

- Entrez

The term entrez is a French word in second person plural form of verb translated to "to enter" meaning literally 'come in'. This search engine allows users to search multidisciplinary health

sciences databases at the National Centre for Biotechnology Information (NCBI) website. NCBI is part of the National Library of Medicine (NLM).

- GoPubMed

This is a knowledge-based search engine for biomedical text.The Gene Ontology (GO) and the Medical Subject Headings (MesH) serve as the "The Table of Contents" in order to structure the millions in the MedLine database

- WebMD

WebMD is a one stop medical information site. WebMD has a lot of interesting interactive calculators, quizzes, and other fun stuff that helps you understand medical information more easily.

- Genieknows
- Healia
- Searchmedia
- Nextbio (Life sciences search engine)

Types of Search Engines

There are 3 main types of search engines:

- Free-text search engines or keyword searching tools- these cover the web in an unstructured way.
  One has to be very specific in their query because of their wide coverage. Examples are Google and AltaVista. See section 2.4.2.As seen from above free-text search engines, they can be country specific, subject specific, or resource specific (for journal articles i.e. www.findarticles.com)

- Meta search engines-These are search engines that offer simultaneous coverage of the major
  search engine on the world wide web by submitting the same query to each other, for example dogpile www.dogpile.com

An example of Meta-search engine: Dogpile

http://www.dogpile.com/

Web directories-These are manually created by people that do a lot of surfing on the Internet. They browse the Internet, evaluate websites for contents that meet their criteria and add the web link to the directory. It is computed in the same way as a telephone directory. Yahoo is an example of a web directory.

An example of a web directory

http://www.yahoo.com/

Advantages and Disadvantages of using search engines

Advantages of search engines:

- Best suited for complex keyword/concept searches
- Control over search: search terms can be combined as required
- Searches can be limited to period of time, fields, source type,etc.
- Currency of information, made possible by regular addition by web spiders
- Exhaustive information can be retrieved (with lots of patience!)

Disadvantages:

- Time consuming
- False positives
- Search engines vary in terms of search techniques/ syntax
- Dead links, redundant links (same document gets displayed)
- Spamming ('salting' of pages)
- Higher ranking of paying sites

Gateways
Gateways are defined as a node or network that serves as an entrance to another network; gateways organize information in a structured way often in subject categories. For health-related information, there are many useful gateways including the WHO A-Z health topics list (http://www.who.int/topics/en/) and AED/SATELLIFE's annotated, subject-based gateway to health resources for developing countries (http://www.healthnet.org/essential-links/)

Common Features of Gateways

- Quality controlled catalogues of Online resources
- Subject based entrances to quality assessed internet resources
- Classified subject keywords
- You can browse by subject or search by keyword
- Information gateways are going online for resources; what librarians do for books
- They are built by humans.

Examples of Gateways in Health Information.

- MedLinePlus (http://medlineplus.gov) MedlinePlus brings together authoritative information from NLM, the National Institutes of Health (NIH), and other government agencies and health-related organizations. Pre-formulated MEDLINE searches are included in MedlinePlus and give easy access to medical journal articles. MedlinePlus

also has extensive information about drugs, an illustrated medical encyclopedia, interactive patient tutorials, and the latest health news

- Medscape (www.medscape.com) A portal for medical information from WebMD. Categories available include alternative medicine, diseases, health & fitness, human body, mental health, journals, organizations, etc.
- Global Health Library (www.globalhealthlibrary.net) A WHO initiative, aims to strengthen,
  promote and develop worldwide networks on the collection, organization, dissemination and universal access to reliable health sciences information
- Internet Health Sites (www.library.mun.ca/) the resources are selected by the Health Sciences Librarians and provide a starting point for finding health information on the Web. Maintained by MUN.
- AddictionSearch (www.addictionsearch.com) your source for addiction related research on drug rehabs and alcohol treatment programs, treatment centers and rehabilitation information. These resources provide comprehensive drug addiction treatment, drug and alcohol rehabs, and substance abuse treatment research.
- ADIN -Australian Drug Information system-(www.adin.com/au)The Australian Drug Information Network (ADIN) provides a central point of access to quality Internet-based alcohol and drug information provided by prominent organisations in Australia and internationally.
- ELISAD - (www.elisad.uni-bremen.de) (Alcohol and Drugs) :-   This addictions gateway is a free online service providing access to the best web resources in Europe on drugs, alcohol, smoking, gambling and related topics. All the resources have been evaluated and a description of each website is given.

Fig 8: An example of an Information gateway.

http://www.healthnet.org/essential-links
Adapted from Wema ,E.(2008?) Search Engines, Directories and Portals .A presentation on the INASP Nairobi workshop

Databases

A database is a collection of information organized in such a way that a computer program can quickly select desired pieces of data. It is an electronic filing system.   Traditional databases are organized by fields, records and files.   A field is a single piece of information; a record is one complete set of fields; and a file is a collection of records. For example, a telephone book is analogous to a file. The Internet contains numerous hypertext databases, where any object whether it be a piece of text, a picture, or a film, can be linked to any other object.

Types of Databases

- Bibliographic Databases
- Full-Text Databases
- Numeric Databases
- Hybrid Databases

Fig 8: An example of a bibliographic Database: International Health and Disability

http://www.asksource.info/res_library.htm

2.6.1 MEDLINE/PubMed Database

MEDLINE is the premier biomedical database of the National Library of Medicine, Bethesda, Maryland, USA. It is searchable on the Internet through PubMed, a free search tool with over 19 million citations. The use of this database is essential for searching full text journals in HINARI and will be discussed at length in the next module.

An Example of PubMed homepage.

http://www.ncbi.nlm.nih.gov/pubmed

Practical Session 2: Opening and searching PubMed.

1. Connect to the Internet and open your internet browser.
2. Type in (or copy/paste) the url of PubMed -
   http://www.ncbi.nlm.nih.gov/sites/entrez?db=pubmed
3. Click on "GO" or hit the Return key (see exercise # 1 for precise instructions)
4. Search the following keyword subject: HIV in developing countries:
5. How many citations did you get?
6. What words could you use to 'narrow' this search?
7. What type of material is indexed in this database?

Digital Archives

There are some searching tools developed by either governmental agencies or by international health related organizations. Resources developed by health-related organizations include

- Governmental agencies such as the U.S. National Institutes of Health at http://www.nih.gov/
- Inter-governmental agencies such as WHO at http://www.who.int/en/ or WHO: Western Pacific Region at http://www.wpro.who.int/
- Non-governmental agencies such as Popline at http://db.jhuccp.org/ics-wpd/popweb/ or Family Health International at http://www.fhi.org/en/index.htm or SateLife at http://www.healthnet.org/

2.7.1 Governmental Agencies

U.S National Institutes of health: -

http://www.nih.gov/

Portals

2.8.1 HINARI -Access to health
Launched in January 2002 by the World Health Organization and six major publishers, HINARI Access
to Research Initiative enables developing countries to gain access to one of the world's largest collections of biomedical and health literature. Free or very low cost online access is provided to many thousands of health workers and researchers, thereby contributing to improved world health. Since its launch, the number of participating publishers and of journals and other full-text resources has grown continuously

HINARI Homepage

http://www.who.int/hinari/en/

HINARI Login page

http://hinari-gw.who.int/

Free Medical Journals

The movement to provide information free online has also provided health professionals with a lot of free journals. Besides the HINARI program, there are a number of useful e-journal gateways that contain access to freely available full text articles on the WWW.   In this section, you will access freemedicaljournals.com, BioMed Central, PubMed Central, Directory of Open Access Journal (DOAJ), Bioline International, ScieLO and Highwire Press.

Free Medical Journals

This website www.freemedicaljournals.com hosts journals in medicine, over 1500 Journals freely accessible via the internet.

Free medical Journals homepage

www.freemedicaljournals.com

Practical Session 3: Free Medical Journals

1. Connect to the Internet and open your internet browser.
2. Type or copy/paste http://www.freemedicaljournals.com into the address box, click on "GO" or hit the Return key.

3. Freemedicaljournals.com lists journals that make content freely available either initially when published or between one month and two years after publication date.
4. How many journals are listed in this gateway?
5. How is the access to the journals organized?

BioMed Central

BioMed central is a publisher in science, technology and medicine, and publishes online peer-reviewed journals. Biomed Central has a portfolio of more than 200 open access e-journals which include general titles such as, BMC Biology and BMC Medicine.

http://www.biomedcentral.com/

High Wire

http://highwire.stanford.edu/

Exercise 4: Browsing High Wire

1. Type in or copy/paste http://highwire.stanford.edu/lists/ into the address box,
2. Click on "GO" or hit the Return key; then click on the Journals With Free Full-text Articles list.
3. The Highwire Press website will open with a list of free access journals.
4. Where would you find information on Highwire Press journals that are 'free to developing economies'?

Institutional Repositories

In a medical related organization, especially an academic one, research work is published in either books or journals. However, not all primary information finds its way into high impact journals. These centres produce reports, technical reports and other documentation daily. This mass of literature is important for medical research work and gives impetus to further research. It is now common for organizations to create institutional repositories as a means of sharing research information.

Institutional Repository at the University of Zimbabwe

http://ir.uz.ac.zw/

Overall Evaluation Exercises for the Module

Below are samples of questions that can be used to evaluate your understanding of the searching tools you have learnt.

1. What is a searching tool?
2. What searching tools are available for print resources?
3. Why would one use an abstracting journal?
4. State three types of search engines you have studied?
5. What are the advantages of using search engines?
6. State 5 tools available in searching online health information?
7. Give a brief overview of PubMed?
8. What is MedLine
9. What are free electronic Journals
10. What is a database? How can you locate health related database.

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Finding, Organizing and Using Health Information: A Training Manual For Students, Researchers and Health Workers In Africa

Ajuwon, Grace Ada

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