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Reference Management Software for students, researchers and academics

Introduction

Paramedic Practice is following a journey to a Profession with university level qualifications, supported by an extensive research based literature and an academic and research workforce, based in dedicated departments/faculties educating future professionals to Degree and Masters level and PhD level in some cases. This is broadly the path taken by the Nursing profession. Key to this journey is building the research capable workforce able to do the research that will fill the professional and academic journals and reference works that form the foundation of the literature of Paramedic Practice.

Good research is underpinned by effective information management. The research process typically requires a thorough review of previously published literature; locating, organising and analysing journals articles, books and other forms of publication. Reference Management Software [RMS] helps you to manage your references and associated electronic full text by providing a specialised database that allows you to capture, store, organise and share references you have identified as relevant to your research.

The aim of this article is ensure that readers who may now be completing Diploma, BSc, MSc PhD's or project research and who will go on to do more research in the future start by knowing how useful RMS is in supporting the process of study, research and writing for publication.

Why would I want to use RMS?

RMS has been around for over two decades. The software is well developed and major database/information providers anticipate that you will use it. They have added functionality to make it easy for you to integrate RMS into the research process, for example one click export of results. Librarians have been making the case for RMS for many years and arguments for using RMS are well rehearsed (Kent 2011). However, there are many reasons why researchers do not use RMS. They may not be aware of RMS, see it as too difficult to use, too expensive to buy or too time consuming to learn. Current RMS is more user friendly than earlier versions and there is more choice, including free-to-use web based software. The ability to use RMS can be seen as a useful research skill in itself, which once learned, can be transferred to other projects. A recent review of RMS (Buckley Owen 2011) described RMS as essential research tool. Evidence from research into the behaviours of young researchers (Generation Y) suggest 58% of them use RMS, with a high proportion in the medical discipline (British Library/JISC 2011).

RMS and Research

Research has a number of stages. Broadly these are: identifying the research problem, researching the literature; designing the methodology; conducting research and writing up. Each stage is informed to a greater or lesser extent by the literature. Using RMS allows you

to collect and have access to all the literature you use over the life of a project and the database you create can be transferred to future projects.

Research the literature begins with searching databases, such as CINAHL, EMBASE or MEDLINE (all available on NHS Evidence if you have an NHS Athens User Name and Password). From the results of these searches you can choose the journals articles that you want to keep and use in your research. Databases give you the option of printing/e-mailing references for the articles you find or saving your results in a format that you can import results into your RMS - called a RIS file. Saving results in this way and importing them into your RMS means you can keep all your references in one place, and revisit your results as often as you need. If your database is online you can also access your references wherever you have an Internet connection. In addition you may want to annotate your references or add your own personal choice of keywords and tags to organise references in a way that suits you and the topic of your research. If you retrieve a.pdf of the full text of the article as well, you can import that too. Most RMS will allow you to annotate .pdf files. For example you import the full text of a journal article. As you read through the article you can make your own notes in the .pdf file. Potentially you can share the article with collaborators over the web who will be able to read your notes and add comments of their own. .

If you have already started your research without RMS, there is an opportunity to consolidate previously found articles into your RMS database. References can be added manually, or using unique article identifiers (DOI - Digital Object Identifier and PMID PubMed identifier). Files that are on your computer can be attached to their correct references, and photocopies scanned and imported.

When you are writing up your research or the RMS will integrate with Microsoft Word or Open Office to enable you to include references from your database into your text. The software will also format references at the end of your work using one of thousands of reference formats already created for you to use.

Using RMS is essential for large projects, however, even for small projects it saves time, increases your effectiveness in using references and the accuracy of your citations. Knowing about, and being able to use RMS, is in itself a useful research skill which will repay the initial investment in learning to use the software you choose.

Which software should I choose?

RMS comes in two types. Paid for software such as EndNote, Reference Manager, RefWorks and Papers (Mac) and free to use software from the Internet such as Mendeley and Zotero. Microsoft Word 2010 also has a built in feature reference management feature.

You may have access to RMS software from your university or college, usually EndNote, RefWorks or Reference Manager. You generally have to pay for software to install the full version on your personal laptop or desktop computer. Your university or college may have arranged for a student discount through certain suppliers.

It's important to understand that RMS uses common standards so you can move references between RMS. For example if you start using EndNote or Reference Manager while at university or college you can choose to move your references to Mendeley or Zotero after graduation if your access was conditional on being a student/researcher. Your RMS will provide at least the following functions:

Import References - from bibliographic databases

Organise References - adding your own keywords and tags or using folders and sub folders

Find References - with the RMS *Search* function

Format References Automatically - using a citation styles such as Harvard, APA etc.

Integrate with your word processor - to enable you to cite references in text and format your bibliography at the end of a piece of work

Export References - to get references from your database in a form that can be shared with others, for example e-mail a file to a colleague for them to import into their own RMS

Share over the web - share bibliographies over the web and work collaboratively with colleagues

Choice of RMS depends on a number of factors. Paid for software has highly developed functionality which will require an investment of time to master. Free software, developed to be easy to use can have frustrating limits on what you can do. Paid for software (Reference Manager, Endnote, RefWorks or Papers) are tried and tested, many bugs have been identified and rectified. Free versions are still going through this process, although Mendeley and Zotero are proactive in improving their products. A number of free products on the web have disappeared over the years. You might feel that if you choose a free web based product there is a danger that it might be withdrawn without warning and you will loose access to both the software and your data. There are no guarantees that this won't happen. There are dangers with paid for web based products too, owners may go out of business, sell the product to another owner or stop development. The key here is that it is possible, because of common standards, such as RIS, to take your data and move to a new product should any of these things happen. It's always good practice to keep backups and RMS will allow you to export references and files to you computer to make backups.

Free software is only free at the Basic Level. You may have to pay to upgrade your subscription to get more storage space or access to more functions. For example, Mendeley offer generous free space to store .pdfs on their servers. This means .pdfs can be accessed anywhere and you can work on multiple computers and synchronise your references with the web interface. If you exceed those limits you need to subscribe monthly to Mendeley to increase your available space. Set against that, paid for software vendors have been criticised for the frequency of new versions, and the consequent costs of upgrading. New versions remain backwardly compatible with older versions, however, and you can choose not to upgrade but stay with the version you are familiar with.

Not all RMS have the same heritage. Reference Manager, EndNote and Papers were originally desktop software with web based features added later. EndNote now has a web version, EndNote Web, which allows you to export from EndNote Desktop to the web and to share bibliographies in groups, work in groups or capture references when your desktop version isn't available. Mendeley, Zotero and RefWorks are web based products. Mendeley has a desktop version that harvests references to individual web based accounts and a "crowd sourced database", a complete, but anonymised (you don't know who uploaded the references) public database of all references saved by users with Mendeley. The web heritage may suit some users who prefer this approach.

There are some practical limits that apply to those working in the NHS and who want software to use on work/NHS managed computers. Very few, if any, NHS managed computers will support Firefox (Zotero was originally a Firefox Plugin). It is unlikely that your desktop version of Mendeley will be able to synchronise online with your web version because of security restrictions. Most NHS Trusts will not allow you to upload any software (free or otherwise) to their computers without permission and you may have to make a case

to your IT department explaining that the software is important to support your research. Keep in mind that you will be asking for the time of an IT technician to upload or enable access. Your IT department may also want to investigate for themselves any licence or security implications. In many cases research for study is based on personal laptops or computers and so not having access to RMS on your work computer need not be a barrier to using it. For work based projects the ability to use RMS and the choice of software needs to be negotiated with IT Departments. A useful contact in this regard is your NHS Librarian who will be able to make a case for using RMS and assist you with your choice, based on your needs and those of the project.

What's on offer

There are a number of comparison tables which compare the functionality of different RMS. They range from the simple (Fenner 2010) to the very detailed (Wikipedia 2011). Most RMS will allow you to download demonstration copies to try before you buy, or use in the case of free software. New RMS is likely to come onto the market, some research may be necessary to identify these. The following offers a thumbnail sketch of the main packages with links to the RMS websites.

Free to use software

Mendeley - works on all major platforms - Mac, Linux and Windows and the basic version is free to use. You have to pay for some additional features and more space if you need it. Mendeley provides a desktop version of the software that integrates with the based web version. Mendeley is especially good at handling .pdf files, importing .pdfs and automatically extracting bibliographic data. Designed with the social web in mind, Mendeley allows you to create a public profile, work on a number of computers provided that you synchronise with the web version and create public groups for discussion and collaboration with colleagues [www.mendeley.com]

Zotero - originally a Firefox plugin, Zotero has recently released a beta version 3.0 that stands alone on your computer and works across all platforms - Mac, Windows and Linux. Zotero also supports new plugins for the Google and Safari browsers. The latest version of Zotero begins to look more like Mendeley with a desktop version that synchronises with an online account to work on multiple computers [www.zotero.org]

Paid for RMS Software

Endnote - Currently in version 15 (X5), Endnote is a heavy weight RMS package with extensive functionality. It includes, among other things, the ability to connect to databases from Endnote and search and download articles using your Endnote software. Endnote does have a web tool associated with it EndNote Web that will enable you to import references to access over the web and share with others. Cost around 150 GBP ex VAT [www.endnote.com]

Reference Manager - Currently in version 12 is another heavy weight package owned by Thompson Reuters who also own Endnote, although technically a competitor product to Endnote, Thompson Reuters in the past have invested more resources in new versions of Endnote. Cost around 150 GBP ex VAT [www.refman.com]

Papers2 for the Mac - Papers2 is a replacement for Papers. Fully revised and updated, Papers2 has an online interface - Livfe - that links to the desktop version to allow sharing references on the web and collaborative working. Although other RMS packages will work with Macs, Papers2 is the only package designed specifically for Macs. Cost around 60 GBP. [http://www.mekentosj.com/papers/]

RefWorks - Entirely Web based product , which can be accessed wherever there is an Internet connection. Licences are sold for a year to individual users. Product is primarily sold to institutions for multi user access, Universities Colleges and research organisations. [www.refworks.com]

Reading this article, especially if you currently attend a university, you may realise you already have access to one of the RMS products described here. Information and support will be available from the university Learning Resource Centre or Learner Support department.

Are there any other benefits?

The article has described the points at which RMS will be useful in a process of searching the literature. There are benefits to you as an individual researcher in the way that using RMS encourages you to think in a more strategic way and take a problem solving approach to literature searching.

RMS expands the volume of references that you can manage. Typically researchers will pick through results *while searching*, choosing possibly from a large number of articles which they will keep or download while they are logged onto a database. RMS allows you to download complete searches of potentially hundreds of references to your personal database which allows you time to adopt more effective approaches to analysis. For example, re-ordering results by author to see which authors are writing most frequently on a specific topic or re-ordering results by publication year to gain an understanding of the profile of publication over time can be done with a single click using RMS, even in a database of thousands of references.

Searching within your results you can apply your own keywords/tags to group results together for a more detailed analysis, for example looking at a clinical condition or methodology, in other words problem solving, breaking the literature down into more manageable groupings. By adding your own annotations/notes you can build a personal knowledge base which you can retain over time, and potentially reuse for other projects.

Finally, RMS assists you to think and write in an academic style, where arguments are based on evidence from previous research and sources of information are correctly attributed and cited. Thinking about gathering references, citation in text and formatting bibliographies encourages a deeper understanding of the technique of writing for academic purposes. Referencing is about more than producing bibliographies in the correct format - RMS can do that for you, it establishes the heritage of your ideas, placing them firmly in the context of previous research. It provides justification and support for the theories, models, frameworks or facts you use to construct your argument and is a signpost to the reader indicating where they can easily find the research you have used.

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Declaration

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