



Researchers' And Medical Student' Experience in Reference Management Software in a Low-Income Country

Expérience des chercheurs et des étudiants en médecine dans les logiciels de gestion de référence dans un pays à faible revenu

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RÉSUMÉ

Introduction : Bien que l'utilisation des logiciels de gestion de référence (LGR) soit en augmentation dans les pays développés, ces logiciels semblent inconnus et moins utilisés dans les pays à faible revenu.

Objectif : Découvrir les grandes tendances de l'utilisation des LGR chez les chercheurs et les doctorants en Tunisie, en tant qu'un pays à faible revenu.

Méthodes : Une enquête sur papier a été remplie par des chercheurs et des doctorants lors d'un séminaire pédagogique à la faculté de médecine de Sfax en 2016, dans le but de collecter des données qualitatives pour déterminer les connaissances et l'utilisation des LGR par les participants.

Résultats : L'enquête a inclus 121 participants, dont 53,7% connaissaient les LGR. Mendeley a été le logiciel le plus connu (41,5%), suivi par Zotero (35,3%) et EndNote (23%). Les sessions de formation en LGR organisées à la faculté ont été suivies par 5% des participants. Parmi les 121 participants, 26,5% utilisaient un LGR. Mendeley était le plus utilisé (46,9%), suivi par EndNote (28,1%) et Zotero (25%). La fonctionnalité du LGR la plus couramment utilisée était l'insertion des citations (66,9%). L'analyse des raisons du choix du LGR a montré que le logiciel a été utilisé parce qu'il était pratique (38,4%), connu (38,4%), facile (30,7%) ou suggéré par des collègues (30,7%). Les logiciels libres ont été préférés par 81% des participants. Cependant, 50,4% ignorent la gratuité du logiciel Zotero. Les différents types de citations insérées par les LGR ont été inconnus par 53,8% des participants ainsi que les différentes sources d'enregistrement de ces citations inconnues par 59% d'entre eux.

Conclusion : Les résultats montrent clairement l'insuffisance des connaissances des étudiants et des chercheurs en médecine en Tunisie sur les LGR. Ces insuffisances sont dû à l'absence de formation en LGR. En conséquence, le besoin de telles formations est très important pour que les chercheurs puissent bénéficier des différents avantages des LGR lors de leur formation médicale universitaire.

Mots clés : Logiciel de gestion de référence, Zotero, EndNote, Mendeley, citations

SUMMARY

Introduction: Although the use of Reference Management Software (RMS) is increasing in developed countries, they seem to be unknown and less used in low-income countries.

Aim: To discover the major trends in the use of RMS among researchers and Ph.D. students in Tunisia, as a low-income country.

Methods: A hardcopy survey was filled out by researchers and Ph.D. students during an educational seminar at the faculty of medicine of Sfax in 2016 with the aim to collect qualitative data to determine the participants' knowledge and use of RMS.

Results: The survey collected 121 participants, among them, 53.7% know RMS. Mendeley proved to be the best-known software (41.5%), followed by Zotero (35.3%) and Endnote (23%). Training sessions in RMS were taken by 5% of participants. Among the 121 participants, 26.5% of them use RMS., Mendeley was the most used (46.9%), followed by EndNote (28.1%) and Zotero (25%). The most commonly popular feature in RMS is inserting citations (66.9%). Therefore, the analysis, of the reasons behind the choice of RMS proves that the software was used because it is convenient (38.4%), most known (38.4%), easy (30.7%), or suggested by colleagues (30.7%). The free and open-source software was preferred by 81% of the participants. However, 50.4% ignore the fact that Zotero is free. Several types and sources of captured citations were unknown by 53.8% and 59% of the rest of the participants.

Conclusion: The results clearly show that the lack of awareness about RMS in Tunisia is due to the absence of a formal training. As a result, the need for such training is highly important for researchers to be able to benefit from the different advantages of RMS while conducting their academic medical education.

Keywords: Reference management software, Zotero, EndNote, Mendeley, citations.

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INTRODUCTION

Reference Management Software (RMS) has been a practical tool for researchers and students since the 1980s and is widely used today, especially in developed countries (1). There is an increasing need among the Tunisian researchers to maintain a database, to create bibliographies, to refer to citations in scientific researches which explains the increasing attention to RMS is also known as bibliographic software, citation management software, or personal bibliographic file (2).

RMS has two main functions, namely, to build a database of the citations to organize scientific production, and format the bibliographic records depending on a variety of citation styles within the manuscript (3). In addition, many reference management applications are now available to the capture, organization, insertion, and elimination of duplicate bibliographic records. They also help record a list of references from electronic database researching. Nevertheless, they vary with respect to cost, overall functionality, and networking function. *EndNote* is known as the most used RMS in medical publications, especially in systemic reviews and meta-analysis. Applications such as *EndNote* and *Reference Manager* are authorized or sold out and run on single-station computers. While others, such as *Mendeley* and *Zotero* are available at little or no cost to the user and can be freely downloaded from the web (4). The benefits of these web-based programs include the ability to save reference databases on secure servers, access them from multiple computers and share a personal library with other researchers and work in a collaborative project (4–6). Therefore, this could be helpful for researchers to expand their bibliographic research and interact with other fellow researchers (5).

The use of RMS has been increasing for the past thirty years in developed countries. However, they seem to be unknown and less used in low income North African countries such as Tunisia. The RMS usage among medical researchers in low-income countries was not described before. The purpose of this study is to discover the major trends in the use of the RMS among researchers and Ph.D. students in Tunisia. The specific purpose is to provide essential information about the proportion of RMS users among medical researchers, to evaluate their knowledge

about this software and to identify which programs were frequently used. The following description helps understand the reason for the lack of use of RMS in low-income countries.

METHODS

It was a prospective cross-sectional study carried out at the faculty of medicine of Sfax during the academic year 2016-2017. For this study, data were collected with a hardcopy survey containing 26 questions with the purpose to collect qualitative information. The surveys were distributed to researchers and Ph.D. students during an educational seminar about medical research. Participants were asked about their general knowledge and use of RMS. Answers were collected anonymously. Each participant was given a number and there was no connection between their answers and their academic roles.

RESULTS

The survey collected 121 results in six seminars.

The academic roles were divided as the following; (10%) assistant professors and (90%) Ph.D. students. The age of the participants ranged between 25 and 38 years-old.

The first important result was the lack of awareness about RMS technique. Only 53.7% of participants admit knowing RMS. *Mendeley* was the best-known software (41.5%) followed by *Zotero* (35.3%) and *Endnote* (23%).

The 87.6% of the participants considered that RMS as a fundamental tool for the academic work.

Despite the fact that 92.5% of participants were interested in RMS, only 5% attended a formal training. The awareness of the university staff about RMS training was insufficient because only 8% of the participants knew about the existence of the academic training. However, 21.5% of the participants use RMS without any prior training.

Participants claimed to have problems not only in making research in Medline (66.3%) but also in managing references (Figure 1). Among users, who represented 26.5% of participants, *Mendeley* was the most used, followed by *EndNote* and *Zotero* (Figure 2). The most used feature in RMS was inserting citations in the manuscript (66.9%) (Figure 3).

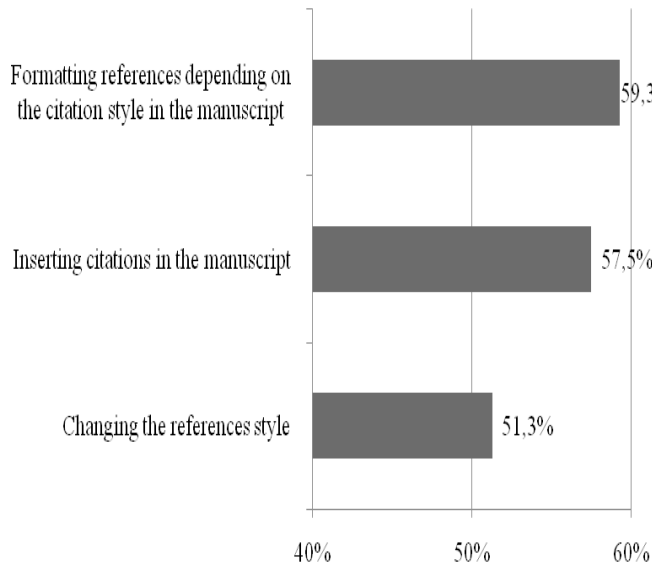


Figure 1: The problems faced by researchers in managing references

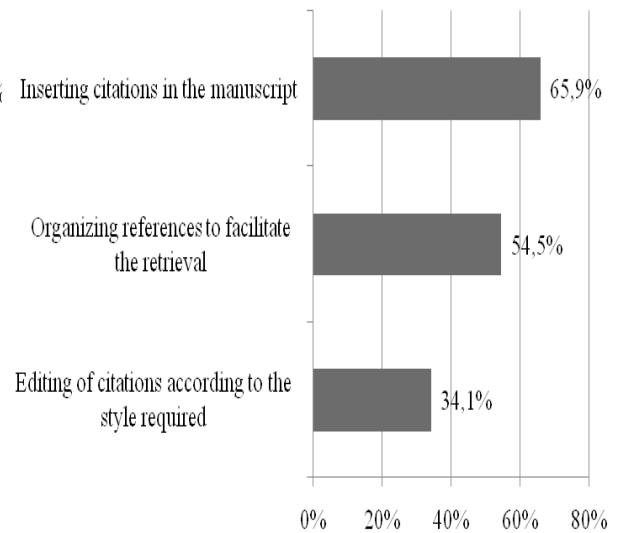


Figure 3: The essential features used in RMS

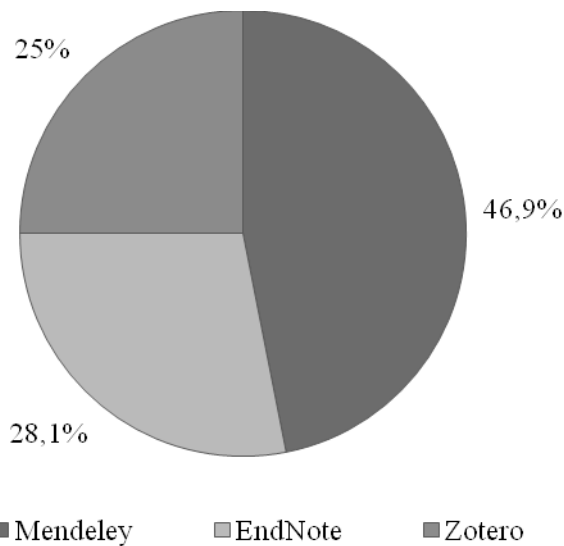


Figure 2: The most used RMS

Table 1: The participants' knowledge about RMS

Pre-test questions	Responses		
	Yes	No	Don't know
RMS can insert and format citations in a manuscript (%)	46.2	2.6	51.3
Writing bibliographic references in a manuscript can be done only in one style for a citation (%)	26.5	25.6	47.9
RMS can insert citations only in Microsoft Word (%)	22.2	20.5	57.3
RMS can automatically correct the referring of citation if a new reference was inserted in the text (%)	39.6	4.4	56
RMS can insert citations from:			
· Articles (%)	46.2	0	53.8
· Books	10.3	35.9	53.8
· Images	3.5	42.7	53.8
· Videos	0.9	45.3	53.8
RMS can import citations from:			
· PubMed	37.6	3.4	59
· Google Scholar	11.1	29.9	59
· Amazon	1.7	39.3	59
· Reviews websites	8.5	32.5	59

The analysis of the reasons behind the choice of RMS proves that the software was used because it was convenient (38.4%), most known (38.4%), easy (30.7%), or suggested by colleagues (30.7%).

The fact that RMS is free and open-source was preferred by 81% of the participants, and only 49.6% of them know that *Zotero* was an open-source software.

The participants' knowledge about RMS was insufficient. The wide variety of captured citations such as articles, books, pictures, and videos was unknown by 53.8% of the participants. The 59% of the participants did not know the different sources of citations inserted by *Zotero*, like PubMed, Google Scholar, Amazon, and websites reviews (Table 1).

DISCUSSION

The focal point of this survey is to describe the difficulties faced by associate professors and Ph.D. students from low-income countries such as Tunisia in managing references and using RMS. To the best of our knowledge, no survey had described the use of RMS in low-income countries. From all participants in the survey, 53.7% were aware of the existence of RMS and only half of them (26.5%) had used it before.

These results contrast with the situation in the developed countries where RMS is widely known and used (7). In Europe, at the University of Torino in Italia, 92% of researchers know about RMS and 75% of them are active users. The non-usage of RMS was especially seen among researchers aged more than 55 years old (8). In high-income countries, the use of RMS was established among researchers as a time-saving tool for writing academic papers (9). However, in low-income countries, the use of RMS is insufficient despite the awareness as it exemplified in the Sri Lankan survey. In the latter, researchers express their views and experience in research publications, the non-usage of RMS was seen despite software awareness (10). Thus, more training could be helpful to promote RMS use. Only 5% of our participants followed educational seminars, training sessions, or workshops in RMS.

Among RMS, *Mendeley* (46.9%) was the most used followed by *EndNote* and *Zotero*. These results differ with those in high-income countries where *EndNote* was the most used. For example, at the University of Torino in Italia, the use of *EndNote* was relevant (49% of users), followed by *BibTeX* (11%) and *Mendeley* (9%) (8). A

Canadian study showed that 52.6% of authors are using *EndNote* to produce literature reviews (4). *EndNote* was sold in most university bookstores in North America and in some universities of the United States and Canada. *EndNote* site licenses are given to students (9).

The lack of knowledge about networking collaboration and virtual science functions explain the lack of awareness about opportunities provided by the web to scientific researchers. Tunisians medical researchers face many difficulties especially in making a search in Medline. Other difficulties include formatting references depending on the required style, inserting citations and changing them from one style to another. These difficulties were also found in researchers working in low incomes countries such as seen in the Sri Lankan research (10).

In our current study, the most common features were inserting and organizing citations in the manuscript. However, editing citations according to the required style was not a relevant activity. This could be explained by the fact that the majority of the participants are Ph.D. students who use Vancouver style recommended by the Tunisian medical universities in the medical doctoral thesis. In the Italian study, RMS was used in their basic functions which are editing and pasting citations when writing a paper. This makes the researchers reluctant to look for any additional RMS features (8).

The reasons behind the choice of one software at the expense of the other numerous RMS ones are varied. In the Italian study, the reasons are subjective such as the choice of the most known software or the one suggested by colleagues (8).

Nevertheless, economic issues can be important in selecting an RMS since the free and open source software was the most popular among our participants. This could explain the frequent use of *Mendeley*. Our results differ from the Italian ones, where only 16% of researchers paid attention to the fact that RMS is free. Moreover, in high-income countries, the economic constraint was not an essential factor in choosing the software (8). This reason probably explains the lack of awareness about open source RMS and the high use of *EndNote* despite studies describing and comparing technical aspects and RMS cost (1,11,12).

Zotero is a free and open-source browser extension produced by the Center for History and New Media at George Mason University (13,14). Even if it was not the first free-of-cost RMS, *Zotero* quickly gained the

reputation of the open source alternative (15). This free open source software is similar to other RMS and can index non-traditional media. It can easily capture web pages, references from an online database, news from a newspaper, book record from an online catalog, films, artwork, bills, law cases, sound recordings, and videos (11,16,17).

There are several potential limitations to our research relevant to the study design and the limited size of the study population. It is a descriptive survey more than explanatory and restricted by the simple collection of quantitative data. Hence, deeper and more analytic studies are suggested in the future.

The main limitation was the small size of the study. This survey was conducted upon a small percentage of researchers from the University associate professors and some and Ph.D. students. This small sample did not represent richness and diversity of the multidisciplinary researchers.

As a consequence, the result of this study cannot be applied to all Tunisian medical universities or the total Tunisian scientific field. All these limitations can be overcome by consistently producing in-depth researches and studies following the same topic.

CONCLUSIONS

Our results clearly show the lack of awareness about RMS and more than the half of the participants ignore the software's basic functions. The lack of knowledge about RMS can be traced back to the lack of specific training on referring citations. Currently, the use of RMS is an alternative option, rather than a part of researchers training and skills. The choice of RMS in low-income countries depends on the cost. Free RMS can be the best alternative in low-income countries. It is clear that training in RMS could help in saving time and making the research process much easier. Thus, medical students and researchers should benefit from a formal training in RMS as part of their academic medical education and curriculum.

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