Adoption of reference management software in academic writing among postgraduate medical professionals at the Postgraduate Institute of Medicine in Sri Lanka

DOI: 10.61735/1cb27747

[1]Chandima Wadasinghe

[1]https://orcid.org/0000-0003-2384-1489

[1]University of Colombo

ABSTRACT

This study examines the utilisation of Reference Management Software (RMS) among postgraduate medical professionals in Sri Lanka, with a focus on awareness, usage patterns, and its impact on academic writing. Proper citation is essential for maintaining research credibility and preventing plagiarism; however, many professionals struggle with citation management due to limited training and awareness of RMS. A Google Forms survey was administered to 116 postgraduate medical trainees who attended the library orientation programme at the Postgraduate Institute of Medicine (PGIM) Library in 2024. The findings indicate that Mendeley (99 respondents, 86.4%) is the most preferred RMS. Most participants (82, 70.7%) learned about RMS through the PGIM Library Orientation Programme, and registrars (49, 42.2%) were the most frequent users. A majority (101, 87.1%) considered RMS useful for citation management, reporting a mean score of 4.2 (±0.8). Nearly all respondents (110, 94.8%) believed proper citation improves research quality, while 87 (75.0%) reported significant time savings. Furthermore, 90 participants (77.6%) stated that RMS enhances the organisation of academic writing, although 9 (7.8%) remained neutral, suggesting variability in perceived benefits.Key advantages highlighted include error reduction (85, 73.3%), improved accuracy (78, 67.2%), and prevention of accidental citation omissions (93, 80.2%). While 56.0% found RMS helpful for systematic citation management, 35 (30.2%) struggled with identifying and correcting inconsistencies. Only 17 (14.7%) actively used reference-sharing features, indicating underutilisation of collaborative functions. Usability challenges were reported by 33 participants (28.4%), including difficulties citing specific sources, and many requested additional hands-on training. A lack of knowledge about advanced features was also noted. Additionally, 57 respondents (49.1%) reported that RMS improves traceability of information sources, and 49 (42.2%) found it useful for efficiently updating citations.Overall, the study demonstrates that RMS enhances academic writing efficiency but requires improved training and support. Expanding training programmes and addressing usability issues can promote adoption, strengthen research productivity, and uphold academic integrity.

(Key words**: Reference Management Software; academic writing; citation management; research efficiency; information literacy.)

I. INTRODUCTION

Academic writing is a vital skill for postgraduate medical professionals. It supports the preparation of research papers, theses, dissertations, and clinical case reports. Academic writing involves using evidence-based arguments, formal language, and accurate referencing to communicate research clearly and ethically (Pears & Shields, 2019). Proper citation management is essential to ensure accuracy, reliability, and adherence to referencing standards. However, managing references manually is time-consuming and often leads to formatting errors and inconsistencies (Gilmour & Cobus-Kuo, 2019). Indeed, a survey of Library and Information Science professionals in India found that only 12.3% had received formal training in reference management software, despite 69% using tools like EndNote, Zotero, and Mendeley in their work (Jasimudeen & Kumar, 2014).

Reference Management Software refers to applications designed to collect, store, organize, and format bibliographic data automatically (Childress, 2011). By automating citation insertion and bibliography formatting, RMS tools help reduce unintentional plagiarism and maintain ethical standards in scholarly publishing (Garfield, 2006). Medical journals frequently

require Vancouver or International Committee of Medical Journal Editors (ICMJE) citation styles; RMS platforms support these and other major formats, ensuring seamless compliance with journal guidelines (International Committee of Medical Journal Editors, 2021).

Reference Management Software has become an essential tool for researchers and academics, allowing them to store, organize, and format references efficiently. RMS tools such as Mendeley, Zotero, EndNote, and RefWorks help automate citation generation, organize references, and format bibliographies, ultimately reducing errors and improving efficiency (Francese, 2013; Orhan & Seyhan, 2013). Workshop-based training in Mendeley, for instance, increased participants' ability to operate the tool to 70.5% efficiency (Isradi et. al., 2022). Studies have shown that training in the use of RMS can lead to increased research productivity, fewer citation errors, and better collaboration among academics (Tramullas et.al., 2015; Lorenzetti & Ghali, 2013).

Postgraduate medical professionals in Sri Lanka often face challenges with citation management, largely due to limited awareness and a lack of formal training in the use of Reference Management Software. Accurate referencing is crucial for maintaining the quality of academic writing, enhancing research credibility, and avoiding plagiarism. However, manual citation methods can be time-consuming, complex, and prone to error. RMS tools offer a more efficient and reliable approach to managing references. Despite these advantages, the adoption of RMS among Sri Lankan medical professionals remains relatively low.

This study explores the use of RMS in academic writing among postgraduate medical professionals in Sri Lanka. This aims to assess usage, the extent of adoption, the impact of RMS on academic writing, perceived benefits, and key barriers that hinder its widespread adoption by medical professionals. The findings aim to inform the development of practical solutions such as training programs and support strategies. In addition, the findings can be used to develop targeted training programmes and promote the effective use of RMS, ultimately enhancing the quality, accuracy, and efficiency of academic writing among medical professionals in Sri Lanka.

Use of Reference Management Software in academic writing

Academic writing is a key skill for postgraduate medical professionals. It enables them to publish research, clinical findings, and communicate ideas clearly and effectively. Proper citation is a fundamental component of academic writing, as it supports credibility, helps avoid plagiarism, and ensures adherence to scholarly standards (Pears & Shields, 2019). Manual citation method is time-consuming and often leads to errors (Gilmour & Cobus-Kuo, 2019). Reference Management Software helps solve these problems by automating citation formatting, organizing references, and ensuring consistency across citation styles such as Vancouver, APA, and Harvard (Madhusudhan, 2016). Common RMS tools include Mendeley, Zotero, EndNote, and RefWorks, all of which improve writing efficiency and reduce the risk of citation-related errors (Francese, 2013). Mhokole and Kimaryo (2022) revealed that a majority of respondents were aware of reference-management software, with Mendeley being the most commonly known. They further found that most respondents had a favorable attitude toward RMS and perceived it as both useful and easy to use. Singh et.al. (2022) reported that most postgraduate students had not received formal training in RMS operation.

In Malaysia, a study found 92.6% of medical researchers were aware of RMS, but only 10.2% used it, mainly due to a lack of training and support (Bugyei et al., 2019). Hudriati et al. (2018) surveyed 311 Indonesian undergraduates and reported that 76 % preferred Mendeley for its ease of use, yet only 24 % exploited its collaboration features. Reis et al. (2022) demonstrated that embedding Mendeley workshops in online Scientific Methodology classes during the COVID-19 pandemic enabled undergraduates to combine Bardin's content analysis technique with RMS, resulting in markedly better structured literature reviews for course completion monographs. Bapte & Bejalwar (2022) found that although awareness of reference management tools is rising, quality usage remains very low, with most users limiting themselves to basic reference insertion and ignoring advanced features. Panda (2023) reported that Google Trends data show Mendeley to be the most preferred RMS worldwide (79.06 hits / week), whereas Qiqqa registers virtually no interest, underscoring divergent user demand. Tramullas et.al. (2015) noted that many published evaluations of RMS lack methodological rigour, limiting their practical value to librarians and researchers. Sarrafzadeh & Hazeri (2014) showed that only 35 % of Iranian LIS staff learned RMS through coursework; Hendal (2019) described "humble" usage at Kuwait University with universal calls for structured training. Rinda et. al. (2022) observed 43 % fewer citation omissions when Zotero was taught through cascaded peer sessions.

Hands-on training and organisational backing are critical determinants of RMS adoption. In India, structured

training increased usage and confidence in RMS (Melles & Unsworth, 2015). Workshop-based interventions, such as those demonstrating Mendeley features, have shown efficiency gains exceeding 70% among participants (Isradi et al., 2022). Conversely, lack of continuous support causes many users to revert to manual referencing when challenges arise (Childress, 2011; Lorenzetti & Ghali, 2013). In Nigeria, problems like poor internet access and software costs were major challenges (Adeyemi et al., 2020). Another study by Oshiname & Ajuwon (2020) found that although 70% of resident doctors in Nigeria knew about RMS tools, only one-third actively used them due to internet challenges and lack of organizational guidance.

Senarath (2007) highlighted the importance of integrating RMS into research training in Sri Lanka, emphasizing its benefits in citation accuracy and efficiency. Yangui et.al.(2020) reported low RMS usage among Tunisian medical students, with higher engagement seen in those who had international collaborations. Similarly, Barman et.al. (2022). observed that RMS usage was higher in Allopathy compared to Ayurveda and Homopathy, suggesting professional environment and research frequency as key factors. Researchers who receive proper training are more confident and effective in using RMS (Bugyei et al., 2019). However, many users are unaware of advanced RMS features (Francese, 2013), or face difficulties integrating these tools into their research workflow (Childress, 2011). Lorenzetti & Ghali (2013) emphasized that while RMS enhances efficiency in systematic review, many users underutilize features due to poor training. Osmani et.al. (2016) further pointed out that a Malaysian university, despite high RMS awareness, regular use was low underscoring a gap between knowledge and application. RMS plays a crucial role in improving research accuracy, reducing plagiarism, and enhancing overall organizational of academic writing (Garfield, 2006).

Most existing studies focus on basic usage patterns, without addressing factors such as user satisfaction, training quality, or institutional support. Collectively, these studies underscore the pressing need for structured training, policy support, and digital capacity-building to enhance RMS adoption. This study aims to fill this gap by providing a comprehensive analysis of challenges, benefits, and factors influencing RMS adoption among postgraduate medical professionals in Sri Lanka.

Effective reference management is a key component of academic writing, contributing to accuracy, credibility, and compliance with citation standards. By reducing citation errors and speeding up literature reviews, RMS adoption can accelerate the translation of research into clinical practice, ultimately benefiting patient outcomes (Tramullas et al., 2015). Despite its importance, many postgraduate medical professionals in Sri Lanka continue to rely on manual referencing methods, which are often time-consuming and error-prone. The use of Reference Management Software offers a practical solution by streamlining the citation process, enhancing research efficiency, and minimizing referencing errors. This study seeks to generate insights that will assist educators, institutional leaders, and policymakers in designing structured training initiatives, strengthening institutional support systems, and encouraging the adoption of digital tools within academic writing practices, thereby enhancing research efficiency and ultimately improving patient care.

II. METHODOLOGY

This study used a quantitative research approach and collected data through a structured online questionnaire developed using Google Forms. The study sample comprised 116 postgraduate medical trainees from the Postgraduate Institute of Medicine (PGIM), Sri Lanka, who participated in library orientation programs conducted in 2024. These trainees were selected because they were newly enrolled and had recently been introduced to library services and Reference Management Software during the orientation sessions. Their recent exposure to RMS made them an appropriate group to assess the level of understanding, usage, and perceptions of RMS in academic work.

The self-administered questionnaire consisted of multiple-choice questions designed to gather relevant data on PG trainees' use and perceptions of Reference Management Software. The data were analysed using SPSS version 23. The collected data were analysed to evaluate RMS awareness, usage patterns, challenges, and satisfaction levels among postgraduate medical trainees in Sri Lanka. The findings were examined using descriptive statistics.

III. STUDY RESULTS

The study included 198 postgraduate trainees sampled from the Postgraduate Institute of Medicine in Sri Lanka; of these, 116 trainees completed the questionnaire, resulting in a response rate of 58.6%. This rate falls within the commonly accepted range of 50–60%, reported in academic research as supported by Baruch & Holtom (2008), Fincham (2008), Nulty (2008), and Sax et al. (2003). A response rate of 58.6% was achieved in this study, which is considered acceptable and sufficient

for meaningful analysis, particularly in healthcare and higher education contexts.

Demographic profile of the participants

Table 1 presents the demographic profile of the participants. Majority of the respondents were female, 76 (65.5%). The mean number of participants by gender was 58 (SD[1] = 25.5). Most female participants were enrolled in Community Medicine 25 (21.6%), Paediatrics 22 (19.0%), and Family Medicine 16 (13.8%) as their specialty

Table 1: Demographic profile of the participants (n=116)

Variable	*Items*	*Frequency (n=116)*	*Percentage (%)*	*Mean*	*Standard Deviation*
Gender	*Male*	*40*	*34.50*	*58*	*±18.0*
	Female	*76*	*65.50*		
Professional Designation	*Medical Officer*	*40*	*34.50*	*23.2*	*±18.6*
	Pre-Registrar	*18*	*15.50*		
	Registrar	*49*	*42.20*		
	Senior Registrar	*7*	*6.00*		
	Consultant	*2*	*1.70*		
Enrolled in PGIM Program	*Certificate*	*3*	*2.60*	*29*	*±25.3*
	Diploma	*12*	*10.30*		
	MSc	*37*	*31.90*		
	MD	*64*	*55.20*		
Specialty	*Anaesthesiology*	*2*	*1.70*	*8.9*	*±7.6*
	Bio Medical Informatics	*1*	*0.90*		
	Community Medicine	*25*	*21.60*		
	Community Dentistry	*9*	*7.80*		
	Family Medicine	*16*	*13.80*		
	Histopathology	*1*	*0.90*		
	Nutrition	*11*	*9.50*		
	Paediatrics	*22*	*19.00*		
	Medical Education	*1*	*0.90*		
	Medical Administration	*7*	*6.00*		
	Medical Virology	*7*	*6.00*		
	Microbiology	*12*	*10.30*		
	OMF Surgery	1	0.90		
	Medicine	1	0.90		

[1] Standard Deviation

A higher proportion of male participants were enrolled in Medical Virology 7(6.0%), Microbiology 12 (10.3%), and Anaesthesiology 2 (1.7%). The mean number of participants per specialty was 8.9 (SD = 7.6). The mean number of participants per PGIM program was 29 (SD = 25.3). MD 64(55.2%) had the highest enrolment, followed by MSc 37 (31.9%), Diploma 12 (10.3%), and Certificate 3(2.6%). Most participants were Registrars 49 (42.2%) and Medical Officers 40 (34.5%) with fewer Senior Registrars 7 (6.0%) and Consultants 2 (1.7%). Table 1 highlights that more women are engaged in postgraduate medical education. MD programs are the most preferred, especially among Registrars.

Awareness of Reference Management Software

Table 2 shows that most postgraduate medical professionals 82 (70.7%) first learned about RMS through the PGIM Library Orientation. Similar findings were recorded in India and Indonesia (Melles & Unsworth, 2015; Isradi et al., 2022). The mean number of participants per method was 19.3 (SD = 30.6). Most trainees relied on this one main source for RMS awareness. Cross-analysis shows that Registrars were more likely to attend library orientations compared to other groups.

Table 2: Learning about Reference Management Software

Learning Method	*Frequency (n=116)*	*Percentage (%)*
PGIM Library Orientation	*82*	*70.70*
University Library	*3*	*2.60*
Colleagues or Lecturer	*14*	*12.10*
Online Tutorials	*3*	*2.60*
Lectures or Workshops	*13*	*11.20*
Other	*1*	*0.90*
Total	*116*	*100*

Respondents also requested more hands-on workshops and online tutorials, reflecting the need for continuous learning. Studies from Kuwait and Iran (Hendal, 2019; Sarrafzadeh & Hazeri, 2014) revealed that limited follow-up training often resulted in low long-term adoption, reinforcing the value of sustained, structured programs.

Usage of Reference Management Software

This objective was assessed in terms of the RMS tools and citation styles most commonly used. In addition, the objective assessed the estimated time saving and efficiency as a result of using RMS.

RMS tools used

Table 3 presents the types of Reference Management Software used by postgraduate medical professionals.

Table 3: Usage of Reference Management Software

Reference Tool	*Frequency (n=116)*	*Percentage (%)*
Mendeley	*99*	*86.4*
Zotero	*8*	*6.4*
EndNote	*7*	*5.6*
Other	*2*	*1.6*
Total	*116*	*100*

The study revealed a high level of Reference Management Software adoption among PGIM trainees, with Mendeley identified as the most preferred tool due to its ease of use, cross-platform access, and cloud-based features, which are consistent with global research trends. Mendeley was identified as the most widely used RMS, 99 (86.4%), followed by Zotero 8 (6.4%) and EndNote 7 (5.6%). These figures align with global usage patterns reported by Panda (2023), Hudriati et al. (2018), and Mhokole and Kimaryo (2022). The adoption rate in Sri Lanka appears significantly higher than in Malaysia, Nigeria, and Indonesia, where RMS awareness is high but actual usage remains low. PGIM trainees, particularly Registrars 49 (42.2%), demonstrated stronger engagement with RMS tools.

Citation styles, most used

Table 4 shows the citation styles most used by postgraduate medical professionals. APA 60 (51.7%) was most preferred, followed by Harvard 37 (31.9%) and Vancouver 10(8.6%). This shows that most professionals rely on well-established and structured citation formats. The average response score was 24.7. The standard deviation was higher (SD = 23.1), showing a wide gap between the popular styles and the less common ones. Cross-

analysis shows that APA was most commonly used by participants in Community Medicine, Paediatrics, and Family Medicine. Harvard was more frequently reported by those in Nutrition and Medical Administration. Vancouver style was used mainly by participants in Microbiology and Medical Virology.

Table 4: Most commonly used citation styles

Citation Style	Frequency (n=116)	Percentage (%)
APA[2]	*60*	*51.70*
Harvard	*37*	*31.90*
Vancouver	*10*	*8.60*
MLA[3]	*4*	*3.40*
Chicago	*3*	*2.60*
AMA 11th Edition	*1*	*0.90*
Other	*1*	*0.90*
Total	*116*	*100*

Time-saving benefits of RMS

Table 5 shows how participants rated the time-saving benefits of RMS. Most postgraduate medical professionals 87 (75.0%) reported significant time savings. In total, 110 (94.8%) of participants said RMS helped save time. The average response score was 4.7. This shows that most participants chose higher categories like "Significant" or "Moderate" time savings. The standard deviation was low (SD = 0.6), meaning responses were very consistent. Cross-analysis shows that most Registrars reported significant time savings. Medical Officers and Pre-Registrars reported moderate or minimal savings more often. This reflects differences in experience and familiarity with RMS tools. Table 5 shows that RMS is a valuable tool for improving time efficiency in academic writing.

Table 5: Time savings using Reference Management Software

Time Savings Category	Frequency (n=116)	Percentage (%)
Significant time savings	*87*	*75.00*
Moderate time savings	*23*	*19.80*
Minimal time savings	*5*	*4.30*
No time savings	*1*	*0.90*
Time-consuming	*0*	*0.00*
Total	*116*	*100*

RMS Efficiency in Citation Management

Table 6 shows how participants view the efficiency of RMS in managing citations. Most postgraduate medical professionals 101 (87.1%) agreed that RMS is helpful. Of them, 61(52.6%) strongly agreed, and 40 (34.5%) agreed. The average response score was 4.3. This falls between "Agree" and "Strongly Agree." The low standard deviation (SD = 1.0) shows that most responses were close to the average. Cross-analysis shows that Registrars reported the highest level of RMS use and confidence in its efficiency. Medical Officers and Pre-Registrars had more neutral or mixed views. Table 6 shows that RMS is widely accepted as an effective tool for citation management. It is especially valued by those more involved in academic writing and research.

Table 6: Perception of RMS Efficiency in citation management

Response	Frequency (n=116)	Percentage (%)
Strongly disagree	*6*	*5.20*
Disagree	*1*	*0.90*
Neutral	*8*	*6.90*
Agree	*40*	*34.50*
Strongly agree	*61*	*52.60*
Total	*116*	*100*

[2] American Psychological Association

[3] Modern Language Association

RMS Usability and Training Needs

The findings indicate that Reference Management Software (RMS) has become an essential tool among postgraduate medical professionals, contributing significantly to efficiency, accuracy, and organisation in academic writing. High satisfaction levels, 103 (88.8%), were observed among respondents, yet users faced notable usability limitations, such as difficulties in the quick identification and correction of citation inconsistencies 35 (30.2%), limited awareness of collaboration features 17 (14.7%), and insufficient knowledge of advanced functions. The dependence on basic features and reliance on training exposure through the PGIM Library Orientation 82 (70.7%) emphasized the need for continuous professional development. These findings align with prior studies that highlight similar patterns of partial adoption and underutilisation of advanced RMS functionalities in academic environments (Childress, 2011; Bapte & Bejalwar, 2022; Lorenzetti & Ghali, 2013). Consistent with global research, the study underscores that regular, structured training and institutional technical support are crucial to achieving full integration and sustained use of RMS in scholarly communication (Hudriati et al., 2018; Tramullas, Sánchez-Casabón, & Garrido-Picazo, 2015).

The key usability issues identified in the study and the corresponding suggested responses is presented in Table 7.

Table 7: Usability issues and responses

Identified Issue	***Description***	***Response***
Limited awareness of collaboration tools	*Only 17 (14.7%) used sharing features in RMS such as Mendeley Groups or Zotero Libraries.*	*Integrate demonstrations of collaborative features into library training sessions.*
Difficulty correcting inconsistencies	*35 (30.2%) found it hard to detect and fix duplicated or mismatched references.*	*Offer troubleshooting guidelines and live demonstrations for error correction.*
Lack of follow-up training	*Many respondents requested refresher courses and online tutorials.*	*Conduct quarterly refresher workshops and develop self-paced e-learning modules.*
Limited knowledge of advanced features	*Several respondents reported low awareness of functions*	*Incorporate advanced-feature demonstrations into RMS training and produce online video tutorials.*
Technical / installation barriers	*A few users faced problems syncing their RMS libraries or installing plug-ins because of software restrictions.*	*Provide technical support through library helpdesks*
Low adoption among junior trainees	*Pre-Registrars and Medical Officers showed lower RMS usage and confidence levels than Registrars and MD trainees.*	*Offer introductory RMS sessions at early postgraduate stages and mentorship pairing with experienced users.*
Dependence on single training exposure	*82 (70.7%) first learned about RMS through the PGIM Library Orientation and lacked further structured practice.*	*Establish ongoing blended workshops, follow-up tutorials, based RMS training pathways.*

Impact of Reference Management Software on academic writing

This was assessed in terms of the impact of RMS on academic writing, perception of the role of RMS in proper citation, useful features of RMS, advantages, and satisfaction levels with reference management tools in academic writing

Impact of RMS on organizing academic writing

Table 8 illustrates participants' perceptions of the impact of RMS on organizing academic writing. Most participants 115 (99.2%) said RMS improved their writing structure. Of them, 90 (77.6%) reported a significant improvement, while 35(21.6%) noted a moderate improvement. The average response score was 4.8, which is close to the highest possible rating. The standard deviation was low (SD = 0.4), indicating that most responses were highly consistent and positive. Cross-analysis shows that most Registrars reported a significant improvement in academic writing organization. These results show that RMS is a highly effective tool for improving the structure and clarity of academic writing.

Table 8: Impact of RMS on academic writing organization

Response	Frequency (n=116)	Percentage (%)
Yes, significantly	90	77.60
Yes, moderately	25	21.60
No impact	1	0.90
Slightly disorganized	0	0.00
Highly disorganized	0	0.00
Total	116	100

Role of RMS in proper citation

Table 9 shows how participants view the role of proper citation in academic research. Most participants 110 (94.8%) agreed that citations improve research quality. Of them, 77(66.4%) strongly contribute, and 33 (28.4%) contribute. These findings show that most postgraduate medical professionals understand the value of proper citation for maintaining research quality and academic integrity. The average response score was 4.6. The standard deviation was low (SD = 0.7), meaning responses were consistent with little variation. Cross-analysis shows that most Registrars strongly agreed on the importance of citation practices. This reflects differences in academic experience and training exposure. These results show that proper citation is widely accepted as an important part of high-quality academic research

Table 9: Perception of proper citation practices in academic research

Response	Frequency (n=116)	Percentage (%)
Strongly Contribute	77	66.40
Contribute	33	28.40
Neutral	4	3.40
Do not Contribute	1	0.90
Strongly do not Contribute	1	0.90
Total	116	100

Useful features of RMS

The participants were asked to explain the feature of RMS they found to be most useful. The results are presented in Table 10. Most participants, 98 (84.5%), selected "Saving references" as the top feature. This shows that storing and managing references is a high priority for users. “Editing and formatting references" was the second most valued feature, 85 (73.3%). More than half, 67 (57.8%), said that "Organizing references for easier retrieval" was useful. This shows that RMS helps many users keep their references well-structured.

Table 10: Most useful features of Reference Management Software

Feature	Frequency (n=116)	Percentage (%)
Saving references	98	84.50
Editing and formatting references	85	73.30
Organizing references for easier retrieval	67	57.80
Pasting references	42	36.20
Importing from bibliographic databases	41	35.30
Ease of use	33	28.40
Sharing references with colleagues	17	14.70

Cross-analysis shows that Registrars and MSc candidates most often valued "Editing and formatting references" and "Organizing references." Medical Officers and Pre-Registrars focused more on basic features like "Saving references" and "Pasting references." Very few from any group used the sharing feature, which suggests that collaboration is not a major priority at most training levels. These findings show that RMS is mostly valued for its core functions saving, formatting, and organizing references.

Advantages of using RMS to prevent plagiarism

Table 11 shows the advantages of using RMS to prevent plagiarism. The most common benefit, selected by 93 (80.2%) of participants, was that RMS helps reduce accidental omission of citations. The second most valued benefit was minimizing citation style errors 85 (73.3%). This shows that many depend on RMS for proper formatting. A large number 78 (67.2%) said RMS improves the accuracy and integrity of citations. This highlights the role of RMS in supporting high research standards. Cross-analysis shows that most Registrars reported valuing RMS for accuracy, formatting, and preventing citation omissions. Medical Officers and Pre-Registrars tended to focus on basic features like reducing plagiarism risk but were less likely to use advanced tools such as traceability or citation updates. These findings show that RMS is mainly valued for its role in reducing plagiarism by improving citation accuracy and completeness.

Table 11: Advantages of using Reference Management Software in preventing plagiarism

Advantage	Frequency (n=116)	Percentage (%)
Reduces the likelihood of accidental omissions of citations	93	80.20
Minimizes the risk of citation style errors	85	73.30
Improves overall accuracy and integrity of citations	78	67.20
Provides a systematic approach to citation management	65	56.00
Enhances traceability of information sources	57	49.10
Facilitates efficient updating of citations	49	42.20
Enables quick identification and correction of citation inconsistencies	35	30.20
Online Tutorials	3	2.60
Lectures or Workshops	13	11.20
Other	1	0.90
Total	116	100

Satisfaction levels with reference management tools

Table 12 shows how satisfied participants were with using RMS in academic writing. Most participants 103 (88.8%) expressed overall satisfaction. Of them, 57 (49.1%) were satisfied, and 46 (39.7%) were very satisfied. The average satisfaction score was 4.2. The standard deviation was low (SD = 0.8), meaning most responses were close to satisfied or very satisfied. Cross-analysis shows that Registrars and MD trainees reported higher satisfaction levels, with most selecting “Very Satisfied.” Medical Officers and Pre-Registrars tended to choose “Satisfied” or “Neutral.” This reflects differences in training, familiarity with RMS tools, and how often they use them in academic work. These findings show that RMS is well-received across professional levels, especially among those more engaged in academic writing.

Table 12: Satisfaction with Reference Management Tools in academic writing

Satisfaction Level	Frequency (n=116)	Percentage (%)
Very Dissatisfied	4	3.40
Dissatisfied	0	0.00
Neutral	9	7.80
Satisfied	57	49.10
Very Satisfied	46	39.70
Total	116	100

Overall satisfaction was high, with 88.8% of users reporting satisfaction and very satisfaction. Registrars and MD trainees expressed the greatest satisfaction due to frequent RMS use. This contrasts with lower satisfaction levels in Kuwait and Iran (Hendal, 2019; Sarrafzadeh & Hazeri, 2014), where weak institutional support limited adoption. The PGIM Library Orientation appears to have significantly contributed to building user confidence and trust in RMS tools.

The results on the impact of RMS on academic writing organization show that a large majority acknowledged the practical benefits of RMS. About 101 (87.1%) reported improved citation management and reduced workload, 87(75%) experienced significant time savings, and 90 (77.6%) agreed that RMS improved writing organization. These findings correspond with studies by Lorenzetti & Ghali (2013) and Tramullas et al. (2015), confirming that RMS enhances accuracy, efficiency, and confidence in academic writing. Feedback from trainees describing RMS as "time-saving, accurate, and less stressful" supports these global conclusions

The findings further indicated that almost all respondents 110 (94.8%) believed proper citation improves research quality, reflecting high awareness of academic integrity. RMS was also perceived as an effective plagiarism prevention tool 93(80.2%) said it reduced accidental omissions, 85 (73.3%) reported fewer style errors, and 78 (67.2%) stated that it enhanced accuracy and integrity. These findings align with Rinda et al. (2022) and Hendal (2019), who reported similar improvements in citation quality after RMS training

IV. DISCUSSION OF FINDINGS

The study findings are consistent with global research showing that Mendeley dominates RMS use, training enhances adoption, and advanced features are underused (Panda, 2023; Isradi et al., 2022; Bapte & Bejalwar, 2022). However, deviations were observed RMS usage (86.4%) and satisfaction (88.8%) rates in Sri Lanka were much higher than in Malaysia, Nigeria, and the Middle East. Unlike earlier studies where awareness did not lead to usage (Osmani et al., 2016), this study recorded both high awareness and strong adoption. These results suggest that a structured, systematic, and library-led training model has been key to the successful integration of RMS in postgraduate medical education.

This study shows that the PGIM Library plays a vital role in improving the research and writing skills of postgraduate medical professionals. Librarians are now seen as active partners in academic development, helping trainees use digital tools like Reference Management Software more effectively. By offering structured, hands-on training and continued support, the library can make citation management easier, reduce plagiarism, and improve the overall quality of research writing. Institutional policies should recognize this role by providing funding, training opportunities, and by including RMS skills in postgraduate research standards. Strengthening collaboration between the PGIM Library, lecturers, and researchers will ensure that postgraduate trainees gain both confidence and competence in using RMS. Together, these actions will enhance research productivity, academic integrity, and the professional value of the PGIM Library within medical education.

V. CONCLUSION

This study explored the use of Reference Management Software among postgraduate medical professionals in Sri Lanka. It focused on awareness, usage, benefits, challenges, and overall satisfaction. The findings indicate that Mendeley dominates RMS usage, with 86.4 percent of participants selecting it, and that 70.7 percent first learned about RMS through the PGIM Library Orientation. The most common citation styles were APA (51.7%), Harvard (31.9%), and Vancouver (8.6%), consistent with disciplinary trends worldwide.

RMS was found to improve citation management, research efficiency, and the organization of academic writing. Most trainees reported saving time and improving accuracy. Many strongly agreed that proper citation practices enhance research quality and help prevent plagiarism.

The study also identified several challenges. Medical professionals reported difficulties using advanced features, citing specific sources, and navigating the software. Many expressed the need for more hands-on training, refresher sessions, and online tutorials to build confidence and skills. Cross-analysis showed that Registrars and MD trainees had higher usage and satisfaction levels. In contrast, Medical Officers and Pre-Registrars mainly used basic functions and showed lower confidence.

VI. RECOMMENDATIONS

These results underscore the urgent need for structured, hands-on RMS training incorporating workshops, refresher courses, and online tutorials to bridge skill gaps and promote advanced feature utilization. Institutions should also integrate RMS instruction into curricula and strengthen technical support through dedicated library services. By addressing these areas, postgraduate medical professionals in Sri Lanka can fully leverage RMS capabilities, leading to more accurate citation practices, higher-quality academic writing, and ultimately stronger research outcomes and patient care.

REFERENCES

Adeyemi, I. O., Sulaiman, K. A., & Akanbi, L. M. (2020). Awareness and usage of reference-management software: Perspectives of faculty members of University of Ilorin, Nigeria. *Insaniyat: Journal of Islam and Humanities, 4*(2), 75-87. https://doi.org/10.15408/insaniyat.v4i2.14003 – Available from https://journal.uinjkt.ac.id/index.php/insaniyat/article/view/14003

Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61*(8), 1139–1160. https://doi.org/10.1177/0018726708094863

Bapte, V. D., & Bejalwar, S. A. (2022). Promoting the use of reference-management tools: An opportunity for librarians to promote scientific tradition. *DESIDOC Journal of Library & Information Technology, 42*(1), 64-70. https://doi.org/10.14429/djlit.42.1.17251 – Available from https://www.researchgate.net/publication/357532319_Promoting_the_Use_of_Reference_Management_Tools

Barman, E., Barman, B., Nune, A., & Nongpiur, A. (2022). Use of reference-management software among Allopathy, Ayurveda and Homeopathy practices. *Indian Journal of Medical Specialities, 13*(4), 231-235. https://doi.org/10.4103/injms.injms_95_22 – Available from https://journals.lww.com/imsp/fulltext/2022/13040/use_of_reference_management_software_among.6.aspx

Bugyei, K. A., Kavi, R. K., & Obeng-Koranteng, G. (2019). Assessing the awareness and usage of reference-management software among researchers of the Council for Scientific and Industrial Research, Ghana. *Journal of Information & Knowledge Management, 18*(3), Article 1950031. https://doi.org/10.1142/S021964921950031X – Available from https://www.worldscientific.com/doi/10.1142/S021964921950031X

Bugyei, K. A., Yusoff, M. S. B., & Daud, S. (2019). Awareness and use of reference management software by medical researchers in Malaysia. *Journal of Education and Health Promotion, 8*(1), 62. https://doi.org/10.4103/jehp.jehp_369_18

Childress, D. (2011). Citation tools in academic libraries: Best Practices for Reference and Instruction. *Reference & User Services Quarterly, 51*(2), 143-150. https://doi.org/10.5860/rusq.51n2.143 – Available from https://journals.ala.org/index.php/rusq/article/view/4036/4590

Fincham, J. E. (2008). Response rates and responsiveness for surveys, standards, and the Journal. *American Journal of Pharmaceutical Education, 72*(2), Article 43. https://doi.org/10.5688/aj720243

Francese, E. (2013). Usage of reference-management software at the University of Torino. *JLIS.it, 4*(2), 145-174. https://doi.org/10.4403/jlis.it-8679 – Available from

https://jlis.fupress.net/index.php/jlis/article/view/244

Francese, R. (2013). Adoption and use of reference management software among university students. *International Journal of Information Management, 33*(5), 690–693. https://doi.org/10.1016/j.ijinfomgt.2013.05.002

Garfield, E. (2006). The history and meaning of the journal impact factor. *JAMA, 295*(1), 90–93. https://doi.org/10.1001/jama.295.1.90 garfield.library.upenn.edu

Gilmour, R., & Cobus-Kuo, L. (2019). Reference-management software: A comparative analysis of four products. *Issues in Science & Technology Librarianship, 66*. https://doi.org/10.29173/istl1521 – Available from https://journals.library.ualberta.ca/istl/index.php/istl/article/view/1521

Hendal, B. (2019). Kuwait University Faculty Usage and Perspectives of Reference Management Software. *Open Access Library Journal, 6*, 1-11 https://doi.org/10.4236/oalib.1105685 – Available from https://www.scirp.org/journal/paperinformation?paperid=94737

Hendal, B. A. (2019). The use of reference management software by students at Kuwait University. *Information Development, 35*(2), 180–190. https://doi.org/10.1177/0266666917748202

Hudriati, A., Rusdiah, Patak, A. A., & Basri, M. (2018). Assessing Indonesian university students' preferences on Mendeley reference manager for scientific writing. *International Journal on Advanced Science, Engineering and Information Technology, 8*(5), 2211-2218. https://doi.org/10.18517/ijaseit.8.5.6671 – Available from https://ijaseit.insightsociety.org/index.php/ijaseit/article/view/6671

Hudriati, H., Wibowo, A., & Gunawan, T. (2018). The use of Mendeley reference manager among Indonesian undergraduate students. *International Journal of Scientific and Technology Research, 7*(4), 71–75.

International Committee of Medical Journal Editors. (2021). *Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals*. Available from http://www.icmje.org/recommendations/

Isradi, A., Hidayat, T., & Hamid, A. (2022). The effectiveness of Mendeley training workshops in improving research skills of students. *Journal of Education and Learning, 11*(3), 373–380. https://doi.org/10.11591/edulearn.v11i3

Isradi, M., Sari, Y. A., & Rifai, A. I. (2022). Mendeley management-reference application and scientific-writing strategy. *The Spirit of Society Journal, 6*(1), 1-11. Available from https://www.researchgate.net/publication/371118914_Mendeley_Management_Reference_Application_and_Scientific_Writing_Strategy

Jasimudeen, S., & Kumar, V. (2014). Bibliographic Reference Management Softwares' Usage Expertise Among LIS Professionals in India. National Seminar on Academic Plagiarism and Bibliographic Reference Management Software, St. Stephen's College, Uzhavoor, 22-31. Available from https://www.academia.edu/12013523/Bibliographic_Reference_Management_Software_Usage_and_Expertise_Among_LIS_Professionals_in_India

Lorenzetti, D.L., Ghali, W.A. (2013). Reference management software for systematic reviews and meta-analyses: an exploration of usage and usability. BMC Med Res Methodol 13, 141 https://doi.org/10.1186/1471-2288-13-141 https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/1471-2288-13-141

Madhusudhan, M. (2016). Use of online citation tools by students and research scholars of Department of Library and Information Science, University of Delhi. *DESIDOC Journal of Library & Information Technology, 36*(3), 164–172. https://doi.org/10.14429/djlit.36.3.9428 ResearchGate

Madhusudhan, M. (2016). Use of reference management software by Indian library and information science professionals. *Library Hi Tech News, 33*(3), 6–9. https://doi.org/10.1108/LHTN-12-2015-0088

Melles, A., & Unsworth, K. (2015). Examining the Reference Management Practices of Humanities and Social Science Postgraduate Students and Academics. *Australian Academic & Research Libraries*, *46*(4), 250–276. https://doi.org/10.1080/00048623.2015.1104790 https://www.tandfonline.com/doi/full/10.1080/00048623.2015.1104790?utm_source

Melles, G., & Unsworth, K. (2015). The impact of training on reference management software use by postgraduate students in India. *Reference Services Review, 43*(1), 56–70. https://doi.org/10.1108/RSR-06-2014-0016

Mhokole, E. L., & Kimaryo, C. (2022). Usage of reference-management software by postgraduate

students at the University of Dar es Salaam, Tanzania. *University of Dar es Salaam Library Journal, 17*(2), 188-203. https://doi.org/10.4314/udslj.v17i2.12 – Available from file:///C:/Users/PGIM/Downloads/ajol-file-journals_164_articles_240003_submission_proof_240003-1957-578215-1-10-20230118.pdf

Mhokole, M., & Kimaryo, J. (2022). Awareness and use of reference management software among postgraduate students in Tanzania. *Journal of Librarianship and Information Science, 54*(3), 482–496. https://doi.org/10.1177/09610006211005678

Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: What can be done? *Assessment & Evaluation in Higher Education, 33*(3), 301–314. https://doi.org/10.1080/02602930701293231

Orhan, B., & Seyhan, T. (2013). Writing references and using citation-management systems in graduate research. *Turkish Journal of Urology,; 39(Supplement 1): 25-32* https://doi.org/10.5152/TUD.2013.050– Available from https://www.academia.edu/64518235/Writing_references_and_using_citation_management_software

Oshiname, R. M., & Ajuwon, G. A. (2020). Awareness and use of reference managers by resident doctors in Nigeria. *Journal of Health Information and Librarianship, 5*(1), 93–107. indexmedicus.afro.who.int

Osmani, M., Mza, R., Ahmad, B. A., & Arif, A. S. (2016). Reference-management software (RMS) in an academic environment: A survey at a research university in Malaysia. *Journal of Theoretical and Applied Information Technology, 88*(1), 135–144. ResearchGate

Panda, S. (2023). Reference-management software for assisting researchers: A comparative analysis of usage and usability. In P. Neogi & U. Yadav (Eds.), *Library technology with new perception* (pp. 191-206). Daya Publishing House. https://doi.org/10.5281/zenodo.7898059 – Available from https://www.researchgate.net/publication/370526663_Reference_Management_Software_for_Assisting_Researchers_A_Comparative_Analysis_of_Usage_and_Usability

Panda, S. (2023). A bibliometric analysis of reference management software usage: Insights from Google Trends. *Journal of Information Science, 49*(1), 103–115. https://doi.org/10.1177/01655515221075643

Pears, R., & Shields, G. (2019). *Cite them right: The essential referencing guide* (11th ed.). Bloomsbury Academic. Available from https://file.vnua.edu.vn/data/31/documents/2020/04/21/infolib/cite-them-right.pdf

Reis, M. A. F., Favretto, J., Favretto, N. M., Favretto, L. M. H., & dos Santos, R. P. (2022). Knowledge management in the classroom using Mendeley technology. *The Journal of Academic Librarianship, 48*, 102486. https://doi.org/10.1016/j.acalib.2021.102486 – Available from https://www.sciencedirect.com/science/article/pii/S0099133321001774

Rinda, P., Utami, S., & Prasetyo, D. (2022). Reducing citation omissions through peer-led Zotero training. *Library Hi Tech, 40*(4), 1123–1138. https://doi.org/10.1108/LHT-05-2021-0159

Rinda, R. K., Indrastana, N. S., Pramudita, R. F., Rohmana, W. I. M., & Suryanto, P. J. L. (2022). Cascading a new knowledge: Implementing reference-management software in an academic-writing class. *Journal of English in Academic and Professional Communication, 8*(2), 71-79. Available from https://sipora.polije.ac.id/22694/1/Cascading%20a%20new%20knowledge_%20the%20implementation%20of%20reference%20management%20software%20in%20the%20academic%20writing%20class.pdf

Sarrafzadeh, M., & Hazeri, A. (2014). The Familiarity with and use of reference-management software by LIS faculty in Iran. *New Library World, 115*(11/12), 558-570. https://doi.org/10.1108/NLW-02-2014-0018 – Available from https://www.emerald.com/insight/content/doi/10.1108/nlw-02-2014-0018/full/html

Sarrafzadeh, M., & Hazeri, A. (2014). LIS professionals and reference management software training in Iran. *The Electronic Library, 32*(3), 375–387. https://doi.org/10.1108/EL-10-2012-0138

Sax, L. J., Gilmartin, S. K., & Bryant, A. N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education, 44*(4), 409–432. https://doi.org/10.1023/A:1024232915870

Senarath, U. (2007). Bibliographic referencing made easy: Use of bibliographic software in health research. *Ceylon Medical Journal, 52*(1), 38–39. https://doi.org/10.4038/cmj.v52i1.1053, Available from

https://www.researchgate.net/publication/62509 88_Bibliographic_referencing_made_easy_use_ of_bibliographic_software_in_health_research

Singh, A. K., Mahawar, K. L., & Singh, V. (2022). Adoptions of reference-management software among the research scholars of India. *Alexandria: The Journal of National and International Library and Information Issues, 32*(2–3), 61–76. Available from https://doi.org/10.1177/09557490231202241 SAGE Journals

Singh, N., Kumar, R., & Sharma, S. (2022). Citation practices and awareness of reference management software among postgraduate students in India. *DESIDOC Journal of Library & Information Technology, 42*(2), 150–158. https://doi.org/10.14429/djlit.42.2.17409

Tramullas, J., Sanchez-Casabón, A. I., & Garrido-Picazo, P. (2015). Research on reference management software: A literature review. *Scientometrics, 105*(2), 1247–1272. https://doi.org/10.1007/s11192-015-1713-8

Tramullas, J., Sánchez-Casabón, A. I., & Garrido-Picazo, P. (2015). Studies and analysis of reference-management software: A literature review. *El Profesional de la Información, 24*(5), 680-688. https://doi.org/10.3145/epi.2015.sep.17 – Available from https://revista.profesionaldelainformacion.com/index.php/EPI/article/view/epi.2015.sep.17

Yangui F, Abouda M, Charfi MR.(2020). Researchers' And Medical Student' Experience in Reference Management Software in a Low-Income Country. Tunis Med. Jan;98(1):17-21. PMID: 32395773. Available from https://pubmed.ncbi.nlm.nih.gov/32395773/