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Usage of Electronic Resources among Ophthalmologists

S Thanuskodi "Dr."
"Alagappa University, India", thanuskodi_s@yahoo.com

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Dr. S. Thanuskodi & Mr. A. Ashok Kumar
Department of Library and Information Science
Alagappa University, India
Email: thanuskodi_s@yahoo.com

Abstract

The results of the study show that the respondents have average level of e-resources usage skills, particularly on awareness about many available e-resources. The variables of the respondents namely gender, age groups, designations, specialisations and the type of institutions were significantly influencing their e-resource usage skills and its dimensions. Frequency of access is daily among the respondents belonging to below 35 years age group. Most of the respondents use open access journals, whilst few have individual subscription to e-Journals. Most of the respondents belonging to Government and private/trust institutions access 1 to 3 e-journals only. Smart phones/ tablets are the widely used devices to access e-resources among ophthalmologists, followed by laptops. The researcher suggested conducting orientation and information literacy programs in order to eradicate lack of awareness. Providing supporting facilities for access, Selective Dissemination of Information and identifying the problems before rectifying are the notable aspects suggested by the researcher. The researcher also insists on the role of libraries and ophthalmology associations regarding the effective usage of electronic and online resources.

Keywords: User Study, Internet, e-resources, Database, social media and ophthalmology.

Introduction

The prominence of electronic and online resources in this information era is a fact that is inevitable. Electronic and digital formats of information are interspersed in our day to day routines personally, academically and professionally. John Shaw Billings, a great surgeon and librarian once famously mentioned, "The learning of the doctor which goes on after he has his degree is, after all, the most important part of his education." The above quote insists about the importance of continuing medical education to be a virtuoso medical professional. For continuous learning, digital resources play a vital supportive role to adopt. As it supports and enhances the output of the better patient care in the society, it is fruitful to do research on the same.

The role of ophthalmologists in this society is unavoidable for eye and vision care of patients. Earlier the information which they sought to support their patient care and medical practices depended solely upon the print versions, but after the technological evolution the multifarious digital formats were also available. Even in the present scenario, some of the medical professionals prefer printed versions of resources, now the condition is changing as they need not come physically to the library premises to find the print formats, but can stay at their clinic table and access online resources through networks at any time. The eclectic availability of e-resources has changed what users actually read and use. The users, particularly doctors now tend to use only what is easily accessible during their constrained time. Serendipity of getting authenticated and reliable resources is still an issue in the usage electronic and online resources. Hence, the necessity of analyses on the usage of e-resources among ophthalmologists spontaneously rises to predict the supportive elements in their

clinical practices. In this chapter, the various facets involved and combined in the present research have been presented and elucidated.

Review of Literature

Meera Newmon and Vandana Sengar (2016) has studied on digital library and e-resources uses and problems in engineering colleges of Rajasthan. This study aimed to know the availability, awareness of e-resources for engineering students and problems while using e-resources. They found through the study that available e-resources is almost sufficient, but the infrastructure to use these facilities is not adequate. The study also resulted that the practical use of e-resources is not up to the worth in comparison to the investments made.

Bhat NA and Ganaie SA (2016) has conducted a survey study on use of e-resources by the users of Dr.Y.S. Parmar University of Horticulture and Forestry. For this study purpose questionnaire were distributed and data collected. The result found that the users are preferred both print and e-resources, in e-resources access they preferred online access only. They concluded the study that the library should procure reputed e-books and e-theses collections and launch an awareness campaign to promote their use.

Kumar G Kiran and Kumbar Mallinath (2012) also conducted a study to evaluate the use of electronic resources among the faculties in five autonomous engineering colleges at Bangalore. Purpose of the study is to evaluate the needs, benefits, and preference of web browsers, search engines, file formats, problem faced, and search patterns as the key parameters. For this purpose, a structured questionnaire is used for data collection besides personal interview and observation to add clarity. The study is limited to the faculty of the Autonomous Engineering Colleges affiliated to Visvesvaraya Technological University (VTU) in Bengaluru Region of Karnataka State, India. It highlights some problems, constraints and forward suggestions for better use of electronic resources. The study assesses the faculty awareness and use of electronic resources in their academic and research needs.

Fleming-May, R.A and Grogg, J.E (2010) has studied about improving understanding of electronic resources usage beyond logons and downloads. Logons and downloads offer a glimpse into user behaviour, but they present only part of the picture. To create a fuller understanding, initiatives such as Project MESUR and the Eigen factor, as well as user-oriented models and ROI studies, have emerged. This study thro light on the factor that the understanding the electronic resources and their usage. Maintaining electronic resources in digital repository and its effectiveness in the usage are discussed in this study.

Kaur B and Verma R (2009) has discussed in their case study on the use of electronic resources in Thapar University. They were attempted to study the issues like use of electronic information resources, its impact on the collection of print and electronic journals its awareness among the users, and the places where the users are accessing these resources. For this study purpose, a survey was conducted in the academic year 2006-07 at the Thapar University, Patiala. A total number of 504 users from the undergraduate, postgraduate, research scholar and faculty members were selected and their response was obtained with the help of questionnaire. The findings show that users from all these categories were using e-resources; the awareness about e-resources encourages users to use such resources to the maximum; and the users are using computer centre and hostels more for accessing the information. Besides, the printed material is being quickly replaced by the electronic resources.

Kelley KB and Orr GJ (2003) analysed in their survey study about trends in distant students' use of electronic resources in the University of Maryland University College (UMUC), Maryland. For this study purpose, Information and Library Services (ILS) at UMUC conducted a needs assessment survey to examine trends in student use of library resources, services, and instruction in order to understand how student usage patterns, needs, and preferences have changed as well as stayed the same. One important element of the survey was to obtain in-depth information on student usage patterns for electronic resources and services. The findings of the survey followed national trends and demonstrated that non-traditional, predominantly part-time students' usage patterns have changed and now favour the use of electronic resources (the Internet, in particular) and also mirror trends observed in traditional student behaviour toward libraries and library resources in many important respects

Yannis K Valtis et al. (2016) has discussed about an EBM programme providing free access to an online clinical resources to health workers in resource-limited settings. This study aimed to analyse UpToDate, a leading evidence based clinical resource and the cost barrier to access the same. The authors suggested to enhance the evidence based clinical resource access include removal of cost barriers as well as technological barriers, such as internet connectivity.

Wong, C. K. et al. (2012) has conducted a study on Chinese older adults' internet use for health information. The Technology Acceptance Model (TAM) was applied to examine the prediction of perceived ease of use, perceived usefulness, and attitudes toward Internet use on behavioural intention to search for health information online. Ninety-eight Chinese older adults were recruited from an academic institute for older people and community centres. Frequency of Internet use and physical and psychological health were also assessed. Results showed that perceived ease of use and attitudes significantly predicted behavioural intention of internet use.

Moretti, F. A et al. (2012) has conducted a study on access to health information on the internet and related with public health issue. This study aims to progress in the understanding of the user profile and of search trends for health information on the internet. For this purpose, analyses were performed based on 1,828 individuals who completed an electronic questionnaire available on a very popular health website. At the same time, through the "elite survey" method, 20 specialists were interviewed, aiming at assessing quality control strategies regarding health information disseminated online. The study brings out the result that a predominance of 90% female users who research information for themselves, who consider the internet one of their main sources of health information (86%), and who spend from 5 to 35 hours online every week (62%) was verified. High reliability is assigned to information from specialists (76%), and low reliability to television, radio, or blogs (14%). This study was concluded that the internet is proving to be a major source of health information for the population, and that website certification is a strategy to be contemplated to improve the quality of information and to promote public health.

Giglio, A. D. et al. (2012) has analysed the quality of internet information available to patients on websites in Portuguese in their paper. Diabetes mellitus (DM), systemic arterial hypertension (SAH), and acute myocardial infarction (AMI) are the most prevalent in Brazil, thus, information on these pathologies is extremely searched for on the internet. For this reason, this study attempted to evaluate the quality of information available in Portuguese on

the Web regarding these disorders. For this purpose, the Discern Questionnaire (DQ) and Health on the Net (HON) were used as tools in order to evaluate the quality of information. At the end of the study brings the results that when evaluating the information content available, 45%, 95%, and 85% of pages had the definition of DM, SAH, and AMI, respectively. They concluded with the derived data that the available information in Portuguese on the internet regarding the three pathologies selected (DM, SAH, and AMI) is quite often inadequate and insufficient.

Gondim, A. P. S. et al. (2012) has analysed regarding the quality of health and medication information on websites. This study aims to evaluate the quality of information about health and medication available on Brazilian websites. For this purpose, a descriptive study with a quantitative approach regarding Brazilian websites, conducted from January to March 2011. The search sites were located using two search phrases: "medication information" and "health information." They concluded the study that the honesty criterion differed significantly between sites, and the quality of information presented on health and medication websites showed significant differences, suggesting the need for a more systematic organization of these topics on the Internet.

Miles, A. (2011) reviewed the electronic medical information resource named, PubMed Health from the National Centre for Biotechnology Information. In this review article the purpose, content and features of PubMed Health was discussed. Support of this electronic resource on Evidence Based Medicine (EBM) and Health Information Technology for Economic and Clinical Health (HITECH) Act are discussed. This review also indicates the importance of awareness this new resource among medical librarians and being prepared to answer questions about the content and purpose of PubMed Health.

Thanuskodi (2010) identified and tested ten e-journal sources: Highwire Press, MedBio World, Ingeta, All Health Net, Blackwell Synergy, Medind, Science Direct, LWW Online, Springer Link, and Health Inter Network India and found that the respondents preferred the Highwire Press CDROM database with a mean score of 4.15 on a 5 point rating scale.

Rice, R. E. (2006) also analysed the multivariate results from the Pew surveys on influences, usage, and outcomes of internet health information searching. This paper provides results from seven major nationally representative datasets from the Pew Internet and American Life Project to answer two primary questions, one is what influences people to seek online health information, and other one is what influences their perceived outcomes from having access to this information. The researcher found that internet health seeking is consistently similar to general Internet activities such as email, news, weather, and sometimes hobbies. A variety of outcomes from or positive assessments of searching for Internet health information are predicted most strongly by gender, engaging in other internet activities, internet health information seeking including more frequent health seeking, more specific health reasons, belonging to an online support group sharing health interests, and helping another deal with an illness or major health condition.

Ahem, D. K. et al. (2006) has discussed in their study on eHealth. This study focused on the perspectives on the evolution of eHealth research. For this study purpose 38 semi-structured, qualitative interviews were conducted among stakeholders in eHealth between May 2002 and September 2003, and the participants were asked about their perspectives on the credibility, value, and future potential of information technology for health behavior

change and chronic disease management. Finally the study brings the results that consistent themes were identified across stakeholder groups, with slight differences in emphasis. They concluded this study with the factors and recommendations included the need for improvement and formalization of development and evaluation standards across private and public sectors, additional research on the technology needs and preferences of traditionally underserved populations, and long-term epidemiologic studies of the impact of eHealth on outcomes and cost-effectiveness.

Eysenbach, G. (2003) also discussed in his study regarding the impact of the internet on cancer outcomes. Based on a comprehensive review of the literature, the available evidence on how persons with cancer are using the Internet and the effect of Internet use on persons with cancer is summarized. The author distinguishes four areas of Internet use: communication via electronic mail, community of virtual support groups, content on health information on internet, and e-commerce. The author found that a conceptual framework summarizing the factors involved in a possible link between Internet use and cancer outcomes and future areas for research are highlighted, and presented in the study.

Brodie, M. et al. (2000) has conducted a study on the health information, the internet and the digital divide. For this study purpose, two telephone surveys conducted between 15 November and 19 December 1999 with nationally representative random samples. Representatives of National Public Radio, the Henry J. Kaiser Family Foundation, and Harvard University's John F. Kennedy School of Government worked together to develop the survey questionnaire and to analyze the results, with fieldwork conducted by International Communications Research. For each survey, the results were weighted to reflect nationwide distribution. The results of the study suggest that there is great potential for using computers and the Internet to make health information available to a wide audience. Once people gain access to the internet, its use at home to get health information is similar across income, education, race, and age. Therefore, the number of persons using the internet to access health information should rise along with computer use.

Adeleke D.S and Emeahara E.N (2016) has studied on the relationship between information literacy and use of electronic information resources by post graduate students of the university of Ibadan, Nigeria. For this study, data were collected using questionnaire. The study found that low level of usage of e-resources, particularly full texts data bases is linked to lack of search techniques skills by most of the postgraduate students. They concluded that ICT course should be part of the curriculam of every postgraduate programme, with emphasis on e-information literacy.

Almarabeh T et al. (2016) has analysed on awareness and usage of computer and internet among medical faculties' students at the University of Jordan. This study aimed to ascertain the computer and internet literacy level of medical faculties' students. The result brings that most medical students have average and advance knowledge on the basic use of computer and internet. They concluded the study with the findings that ICT can be a useful tool in medical education but the lack of time, internet connectivity and resources is still a serious constraint.

Thanuskodi, S., & Meena, M. (2013) reported the result of a survey conducted at Annamalai University to determine the extent to which users are aware and make use of e-journals. The study also examines the search pattern of e-journals. A questionnaire was

distributed among the faculty members, research scholars, and post-graduate students to collect desired data. A total of 200 questionnaires were distributed to the selected sample of Faculty of Engineering and Technology; 180 valid samples were collected. The result reveals that 46.67% of respondents want to access only electronic version of journals, whereas only 23.88% of users want to read the printed journals, but 29.45% of respondents want to use both electronic and printed journals. The study found that most of the respondents 73.33% use e-journals for writing papers. 68.33% of respondents use e-journals for studying their course work, and 51.11% of respondents use them for research work. The analysis reveals that most of the respondents, 73.33%, use e-journals for writing papers.

Thanuskodi, S., & Subramaniyan, S. (2013) identified e-resources are mushrooming online and in other formats. This phenomenon is due to the rapid advancement of information technologies, including the Internet and digitizing techniques. The extent of e-resources (including e-journals, e-books, etc.) is spiraling, although no exact number is available. These changes significantly enlarge the size of the electronic resources pool. Electronic resources have become one of the most important aspects of a digital library. The study reveals that slightly over one-third of the respondents (40%) spent less than 2 hours on the Internet per session, followed by those having 2-3 hours per session (29.17%). The study also shows that of the total of 120 respondents, 30.83% search documents with the help of the library Website

Abbas AD et al. (2013) were conducted a survey on information-seeking behaviour and computer literacy among resident doctors in Maiduguri, Nigeria. This study also aims to examine its relationship to computer ownership. For this study purpose, a pre-tested self-administered questionnaire was used to obtain information from the resident doctors in the University of Maiduguri Teaching Hospital (UMTH) and the Federal Neuro-Psychiatry Hospital (FNPH). Finally the study ends with the results that 73% of respondents use printed material as their major source of medical information. Ninety three percentages of the respondents own a laptop, a desktop or both, while 7 have no computers. Ninety-four percentage respondents only had computer literacy. They concluded the study as despite the high computer ownership and literacy rate among resident doctors, the printed material remains their main source of medical information.

Lee, Doohee and Rutsohn, P. (2012) also conducted a national physician survey study on racial differences in the usage of information technology. This study, using a national physician survey (n = 6,628), investigated racial differences in the utilization of IT. Results of the study reveal racial differences in the usage of IT. The authors of the study concluded the report as the findings make a contribution to the literature by revealing that acceptance and adoption rates of IT may vary significantly between majority and minority physicians at the national level. This observation could have an impact on efforts ranging from policy development to resource allocation to entrepreneurial activities such as Internet marketing as the role of IT continues to unfold in the medical community.

Objectives of the Study

The primary objectives of the study are framed as follows:

- To analyse the information competency skill among ophthalmologists on their information needs.

- To identify the awareness among ophthalmologists on availability of internet and electronic resources in the field of ophthalmology.

- To study the accessibility skills of electronic and internet resources among the ophthalmologists.

- To know the purpose of the usage of electronic resources.

- To ensure the advantages of using electronic and internet resources.

- To analyse the level of problems facing by the ophthalmologists while using electronic resources.

- To find the frequency of accessing e-resources by the ophthalmologists.

- To know the mode of accessing e-Journals by the ophthalmologists.

- To identify the most satisfied e-resources for the ophthalmologists.

Methodology

This study is aimed to find out the actual usage of e-resources among ophthalmologists, including ophthalmology students. For this purpose ophthalmologists were selected from various eye hospitals including individual clinics and the ophthalmology students were selected from various post graduate institutes of ophthalmology. The population from which the sample is drawn belonged to the selected eye hospitals, eye clinics and post graduate institutes of ophthalmology only, from the state of Tamilnadu. The term 'ophthalmology doctors' consists of various positions like senior consultant, junior consultant and professors from selected hospitals and clinics in Tamilnadu. The term 'ophthalmology students' denotes the PG students including DNB and MS, senior residents and fellowship students, and short term trainees from selected Government and private institutes of Tamilnadu. Aiming at a successful study, with respect to the time constraint of the doctors, the investigator has taken limited hospitals, clinics and institutes in the state to do the investigation. The number of people from the target population where the researcher conducting survey is the sample size for the survey study. For this present study, 450 questionnaires were distributed among ophthalmologists and ophthalmology students, only 358 filled questionnaires (79%) were received.

Major Findings

E-Resources usage skills
It is found that the ophthalmologists have average level of skills in e-resources usage and its dimensions, as they scored more than 50% in all dimensions of e-resources usage skills. They are being aware of the 'advantages' of e-resources (83%), which is higher than other dimensions and they encountered 'problems' while using e-resources at average level (54%) which is lower than all other dimensions of e-resources usage skills. The notable

aspect is that their awareness on the availability of various e-resources is only at on average level (55%).

It is predicted that there is no significant difference between male and female ophthalmologists with regards to information competency, awareness on e-resources, accessibility of e-resources, advantages of e-resources and problems while using e-resources. It is also identified that there is significant difference between male and female ophthalmologists in the aspects of purposes of using e-resources. It could be observed that there is a gender difference in the aspect of purposes of using e-resources according to the scored mean.

It is found that the age group difference has significantly influencing relationship with all dimensions of e-resources usage skills. The respondents who belong to 'above 45 years' age group have higher information competency skills than the respondents of the other age groups, which reflects their experience on information seeking. With respect to the purpose of using e-resources the respondents belonging to 'below 25 years' and '31-35 years' age groups who are the younger generation scored higher. This finding reflects that the younger generation keenly uses e-resources for various purposes such as study, research, preparation for journal club presentation, taking notes for teaching and publication purposes.

It is identified that ophthalmologists in various designations have significantly influencing relationship with all dimensions of e-resources usage skills. The senior consultants have higher e-resources usage skills than the ophthalmologist in other designation. In particular, the senior consultants and junior consultants have scored higher when compare with ophthalmologists in other designations while considering their purpose of usage.

There is significant difference among the ophthalmologists belonging to the various specialisations in ophthalmology, with respect to all dimensions of e-resources usage skills. With respect to information competency, the respondents belonging to neuro-ophthalmology specialisation had higher mean than other specialisations. The respondents who have specialised in paediatric with strabismus were found to have more awareness than ophthalmologists with other specialisations. The accessibility to e-resources were found to be equally higher among paediatric with strabismus, glaucoma and neuro-ophthalmology specialised ophthalmologists than ophthalmologists with others specialisations. The respondents belonging to glaucoma and orbit oculoplastics specialisations have scored higher mean on the purpose of using e-resources than ophthalmologists with other specialisations. In the dimension of advantages, the ophthalmologists specialised in uvea scored higher mean than the ophthalmologists with other specialisations. The respondents belonging to paediatric with strabismus specialisation were found to be have higher mean in 'problems' than the ophthalmologists with other specialisations, which reflects that they have been facing more problems while using e-resources than ophthalmologists with other specialisations. The differences found among the various e-resources usage skills with respect to various specialisations throws light on the information requirements for the study, research and practices; availability of e-resources; available formats of e-resources and concerned doctors' busy schedule in their particular specialised area.

It is found that the 'types of institutions' has significantly influencing relationship with all dimensions of e-resources usage skills, except accessibility. There is no significant difference in accessibility, with reference to various types of institutions. The respondents

belonging to private/ trust hospitals and institutions were found to have higher mean with respect to 'information competency', 'advantages' and 'purposes', which shows their continuous academic learning and research. It is predicted that the respondents belonging to Government institutions and hospitals have higher awareness on e-resources than other respondents. Comparatively the respondents who belong to individual clinics and Government institutions and hospitals face more problems while using e-resources, which reflects the inadequate supporting facilities to access and use e-resources.

Frequency of access

Most of the respondents accessing e-resources 'daily', belonging to the age group of 35 years and below, which reflects that the youngsters are accessing e-resources daily. Most of the respondents belonging to the age group of above 36 years are accessing e-resources in 'twice in a week' and 'once in a week' basis. The work schedule of the ophthalmologists who belong to that age group may the cause for this difference. It could be seen that the professors of ophthalmology were accessing e-resources not on daily basis, but on 'twice in a week' and 'once in a week' basis. It is also found that very few respondents are accessing e-resources never, which reflects the overall awareness on the importance of e-resources among the ophthalmologists. Most of the respondents who belong to Government and private/trust institutions are accessing e-resources daily, whilst most of the respondents belonging to individual clinics are accessing e-resources once in a month.

E-Journal access

Most of the respondents belonging to senior residents / scholars and professors categories depend on their institutional subscription to access e-Journals. It is found that their e-resources access is maximum depending on the academic institution where they are pursuing their research and medical practices. It is identified that the PG students, senior consultants and junior consultants prefer open access to e-Journals for their information needs. It is also found that the short term trainees are equally accessing e-resources through institutional subscription and the access sponsored by pharma companies and associations. Few respondents have individual subscriptions to e-Journals with respect to various designations, may be due to costlier subscription charges. It is identified that large number of respondents who belong to Government institutions have individual subscription whereas the respondents who belong to private/trust institutions have access to open access journals only. The respondents belonging to individual clinics were equally access e-Journals through individual subscription and open access.

It is found that most of the respondents belonging to Government and private/ trust institutions were accessing 1 to 3 e-Journals, whereas most of the respondents belonging to individual clinics were accessing above 10 e-Journals. It shows that the specialisation of the ophthalmologists may decide the needs for e-Journals, as the Government and private/trust institutions doctors focused on particular specialisation, whilst the ophthalmologists belonging to individual clinics were seeking updated information on all specialisations. Most of the PG students and professors were accessing 1 to 3 e-Journals, which reflects their examination oriented academic needs. Whilst most of the senior residents / scholars, senior consultants and short term trainees were accessing 4 to 6 e-Journals. It is also found that most of the junior consultants do not access any e-Journals, which may be due to their lack of time.

Usage of devices to access

Most used devices to access e-resources are smart phones / tablets, followed by laptops. It shows the preference of comfortable handling the devices by the respondents. Usage of e-Book readers is found to be very minimal, compared to other devices to access e-resources. Most of the respondents of younger generation belonging to below 25 years and '26 to 30' years age groups were using smart phones, while the respondents who belong to 31 to 35 years, 36 to 40 years, 41 to 45 years and above 45 years age groups were using laptops to access e-resources.

Access to online resources and search techniques

It is found that most of the ophthalmologists belonging to all age groups and all designations were accessing online resources by using search engines. It is also identified that phrase search was the most frequently used search technique by most of the respondents belonging to below 25 years, 26 to 30 years, 31 to 35 years and above 45 years age groups. It was notable finding that the respondents belonging to the 36 to 40 years and 41 to 45 years age groups did not know any search techniques at all.

Period of awareness

It is known from the study that most of the male doctors had awareness on e-resources since last 10 years and female doctors had awareness on e-resources since last 7 years. It is also known that most of the PG students and professors had awareness on e-resources since last 7 years, meanwhile senior residents / scholars, junior consultants and senior consultants had awareness on e-resources since last 10 years. It reflects their nature of continuing education, academic, research and publication work based on their designations and age groups.

Awareness and usage of Mobile Apps and PubMed

It is identified that most of the ophthalmologists with respect to the variables such as gender, age groups, designations and types of institutions were using mobile apps 'sometimes' (41.1%) whereas only few were using it always (6.1%).

The proficiency of PubMed search and usage by male and female respondents is found to be at moderate level. With respect to all age groups, the respondents have proficiency in PubMed search and usage was found to be at moderate level, except the 26 to 30 years and 31 to 35 years age groups. The respondents belonging to the age groups 26 to 30 years and 31 to 35 years were found to have higher proficiency in searching and using PubMed. It is identified that PG students, professors, senior consultants and short term trainees has moderate level of proficiency, whilst junior consultants has higher level of proficiency. Most of the senior residents / scholars have higher level as similar as moderate level of proficiency in PubMed search and usage. Totally 14.8% of respondents only have extreme level of proficiency in PubMed search and usage. These findings reflect the lack of awareness on mobile applications and on other hand, lack of proper training in PubMed search and usage.

Awareness and usage of Cochrane Eye and Vision, ClinicalKey and Vision 2020

It is identified that most of the ophthalmologists with respect to gender, age groups and institutions use Cochrane Eye and Vision 'sometimes' (38.5%). It is also found that most of the junior consultants 'often' use and short term trainees never use these e-resources.

With respect to usage of ClinicalKey, most of the male and female ophthalmologists, respondents belonging to 26 to 30 years and 36 to 40 years age groups, PG students, senior residents/ scholars, junior consultants and short term trainees never use. Most of the respondents belonging to 31 to 35 years, 41 to 45 years age groups, individual clinics, professors and senior consultants use ClinicalKey sometimes. The respondents who always and often used ClinicalKey were found to be minimal and insignificant.

Vision 2020 e-resources are being used by most of the ophthalmologists 'sometimes'. Most of the respondents belonging to 36 to 40 years age group and junior consultants are 'seldom' users of Vision2020 e-resources. These derived data shows the lack of awareness on Cochrane Eye and Vision, ClinicalKey and Vision2020 e-resources and the respondents' dependence on concerned libraries for their e-resource retrievals.

Maximum online search analyses

The ophthalmologists' maximum online search was performed to find journal articles (40.8%), followed by e-Books (21.8%). It is found that maximum online search was done by the PG students to find e-Books, which reflects their preference of e-resources related to their examination oriented academic needs. The senior residents/ scholars, professors and senior consultants preferred journal articles, which shows their choice was based on their research, teaching notes and continuing education. The junior consultants carried out maximum online search equally for surgical video clippings and journal articles, whilst short term trainees preferred browsing clinical images.

Interestingly, the respondents belonging to cornea and refractive surgery, retinal vitreous/ diabetic retinopathy, uvea, orbit oculoplastics and low vision specialisations preferred maximum online search to find journal articles. Meanwhile, general ophthalmology and paediatric with strabismus specialists carried out maximum online search for e-Books and glaucoma specialists carried out maximum online search to find surgical video clippings. These findings reveal that the respondents' choice of online search was based on their academic and professional needs.

Mode of accessing surgical videos

It is known from the analyses that most of the ophthalmologists access surgical video clippings through 'online channels' with respect to all age groups, except 41 to 45 years and above 45 years age groups, as their preference is 'CD/DVDs' as a mode to access surgical video clippings. Online channels were found to be preferred by most of the PG students, senior residents/ scholars, junior consultants and senior consultants also. Most of the professors preferred 'CD/DVDs', whilst the short term trainees depended equally on 'library drives' and 'mobile apps' to access surgical video clippings. These derived data from the study reveals their extreme level of awareness on online channels like 'EyeTube' to access surgical video clippings. At the same time it could be predicted that some of them preferred offline access such as CD/DVDs and library drives for their convenience.

Most satisfied e-resources

It is identified that ophthalmologists were most satisfied with e-Journals, followed by e-Books. The respondents belonging to the age group of 'below 25' years, the younger generation mostly prefer e-Books for their examination focused academic needs. It is also known that most of the respondents belonging to all designations were satisfied with e-Journals to update their professional skills, except short term trainees. The short term trainees were mostly satisfied with surgical video clippings and online discussion forums, as it heeds their needs of practical oriented study. For the specialists in the areas of cornea and refractive surgery, retinal vitreous / diabetic retinopathy, glaucoma, uvea, orbit oculoplastics and low vision, the e-Journals are being the most satisfying e-resources. E-Books are the most satisfying e-resources for the respondents belonging to general ophthalmology, whilst surgical video clippings for the respondents belonging to cataract/ IOL and neuro-ophthalmology specialisations. For paediatric with strabismus specialists, both the e-Books and e-Journals are satisfying e-resources. Mostly the respondents belong to Government institutions satisfied with e-Books, whereas private/ trust and individual clinics were satisfied with e-Journals. These variances in satisfaction derived from the study reveal the difference in the needs, day to day practices and researches carried out by ophthalmologists of every category.

Social media usage

It is found that the ophthalmologists mostly use social media to communicate with friends, followed by the purpose to update subject knowledge with reference to all age groups, except '41 to 45 years' age group. The respondents belonging to '41 to 45 years' age group mostly use social media to connect with other doctors worldwide. At the same time, most of the PG students, senior residents/scholars and junior consultants use social media to communicate with friends, whilst professors and senior consultants use social media to connect with other doctors worldwide. It is also found that the most used social media to share information among ophthalmologists is WhatsApp groups, followed by Facebook pages, particularly among '26-30 years' age groups. These derived data says that the social media are primarily used for general communication whereas communicating with friends and updating subject knowledge happened to be their secondary preference only.

Opinions and expectations of respondents

Most of the respondents, who are not belonging to academic sectors opined that they unable to spend up to 3 hours in a working day for information seeking, which reveals that their tight work schedule and time constraints. Their opinion that some e-resources listed are new to them reflects their lack of awareness on the availability of some online and electronic resources. Their demands on support from their institution management to develop authorship skills by supporting their publications represent the lack of academic and research support from their hospitals and institutions. The respondents' expectations on the needs of more open access resources directly indicate the incessantly increasing costs of subscriptions. It shows that the economic hindrance impedes their e-resource usage, particularly for the ophthalmologists belonging to individual clinics.

Conclusion

In the present study, the researcher derived data through a well-structured questionnaire focused on e-resources usage skills and its dimensions, to identify the actual usage of e-resources among ophthalmologists in the state of Tamilnadu. The result of the study throws light on e-resources usage skills among ophthalmologists, and found that they have average level of usage skills. The study also brings the findings on awareness and usage of specific e-resources which are available online, such as PubMed, Cochrane Eye and Vision, ClinicalKey and Vision2020 e-resources. It also identified the awareness and usage of latest technology to access e-resources such as smart phone applications /mobile applications.

The overall study throws light on the fact that the management of the concerned institutions and hospitals should consider about measures to intensify the investments on e-resources in their libraries. The libraries should be well-equipped to obtain the latest technology to support the doctors' ever increasing information needs in this digital era. The age has changed from 'providing e-resources at the client's desktop' to 'providing e-resources at the client's hand palm', as the smart phones and the devices like e-Book readers play an inevitable role in daily life. Also, now-a-days there are varied formats of e-resources not only in readable formats, but it is watchable and audible. The audio visual resources like surgery videos and subject lectures are augmented. Hence, the libraries should be ready for the challenge to provide to digital formats of resources for effective use. As stated in the suggestions part, to escalate the information competency, awareness, accessibility and usage of e-resources without any accessing problems for various academic, research and publication purposes, the libraries play an integral role to perform. The medical librarians cannot train the doctors, unless they themselves are well trained and qualified to handle electronic and online resources. The importance of ICT skilled library professionals is noteworthy to enrich the e-resources usage among the medical professionals, including ophthalmologists.

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