

Use of the Internet by Medical Doctors in the State of Tamil Nadu with the Special Reference to the Work Sector

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Abstract: Today internet revolves as a connecting link worldwide with loads of information and it has become a part and parcel of life. There are few studies conducted in India regarding Internet usage, but most of these studies are conducted on medical students, hospital management etc., but not on medical doctors. The main objective of this paper is to find out the internet usage among medical professionals. For this investigation the researchers selected medical doctors as samples from three categories such as government sectors, private sectors and doctors who own their own clinic. The result of the study reveals that there is significant result in usage of internet for various purposes among medical professionals.

Keywords: Internet, new media, medical professionals, online medical database, online medical journals.

I. INTRODUCTION

Internet plays a vital role in sharing information among one another. Edward and Bruce (2002) observe that, “sources of information and other opportunities available via the Internet are increasing exponentially. The evolving nature of medical knowledge and technology requires medical doctors to develop computer skills (Tillman 2003). Joachim E. Fischer et al (2001) argue that in recent years several information management systems designed to meet the information needs of practicing physicians have been implemented in different countries and languages.

Linda Casebeer et al (2002) the Internet has been proposed as a possible tool to facilitate to access information and permeates almost every segment of today’s economy. An annual interview of a random sample of 1,000 U.S. physicians by the American Medical Association (AMA) demonstrated that 10% of physicians surveyed in 1997, 37% surveyed in 1999, and 70% surveyed in 2000 were World Wide Web (Web) users. Physicians reported most frequently using the Web for electronic mail (e-mail), medical information sources, travel information, product information, and professional association communications.

The Internet’s effect on medical practices has grown exponentially according to research done at the Center of Global eHealth Innovation at the University of Toronto, which specifically cites the likes of Google Health, Microsoft HealthVault (Dossia Eysenbach, 2008). Access and use of internet to seek health related information among medical doctors is important to provide a high quality of health services and to solve various health issues. In their medical practice, “physicians experience very specific information needs, in relation to which precision, reliability and promptness are fundamental aspects” (Martinez and Oddone 2008).

The advances of internet have led to new therapies, diagnostic tools, and ways of communicating. As physicians and lifelong learners, it has been imperative to embrace the new when it has meant better and more efficient patient care while holding on to the stable tenets of medicine that root our profession: humanism, integrity, ethics, professionalism, and trust, Katherine and Chretien (2015). Physicians are also exploring internet, both personally and professionally, although personal use is more common. Some physicians use internet media professionally to find and share health information, communicate/network with colleagues and trainees. The present investigation throws a light on the usage of internet in the field of medicine by medical doctors to enhance their profession.

There are a good number of theories and models employed in studying individuals' ICT adoption. Social psychology and its applied theories and models have been mainly used in this strand of research. These theories and models focus on people's intention to engage in a certain behavior (i.e., adopt and use ICT) as a major theoretical foundation. Both Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) (Icek Ajzen, 1985) have been widely used in ICT adoption and use research. As two of the major intention based theories they provide the basic theoretical backgrounds for other adoption theories including Technology Acceptance Model (TAM) and Enhanced TAM.

TAM, based on the theory of Reasoned Action (Fishbein and Ajzen, 1980), is a simple model of IT adoption that claims that the overall IT acceptance or utilization is based on users' beliefs like (a) system's perceived usefulness (PU) and (b) systems' perceived ease-of-use (PEOU), which are the major impact factors for their (c) attitude towards use (ATT) and also (d) behavioral intentions to use (BI). The objectives of the study are as follows:

- To measure the influence of internet among medical doctors
- To measure the nature of association between the users' demographics (occupation) and the dependent variables (usage of internet).
- To study the usage pattern among the users (Do they use internet)

II. REVIEW OF LITERATURE

The internet, short for inter-network, was initially designed as a medium to exchange research data, but it has now become an essential part of the technological infrastructure of modern organisations in both the public and private sectors. Some have even claimed it to be the fundamental basis of a global information society (Currie, 2000). If one can observe, in the current scenario there are a numbers of physicians who rely on the internet for information on health. A study, conducted early in 2009 by Manhattan Research, 89% of physicians who use the Internet for health information.

Benjamin Hughesa (2009) states that physicians use the internet far more than the general public and though physicians still prefer to consult with colleagues on complex cases the internet is viewed as an increasingly important source of medical information. This use of the internet is being impacted by Web 2.0, a term that represents a second generation of web- based tools and communities (e.g., social-networking sites, wikis) which aim to facilitate user collaboration by user-centric design.

In a study conducted by researchers Priyadarshini, Nandini et al (2013) finds that Assistant professor/Senior residents (80%) were the respondents who use it in higher level; associate professors were in the second categories (71.7%). Assistant professor/Senior resident used the Internet daily. Majority of the doctors had access to internet both purposes. Use of internet to seek health related information among medical doctors is important to provide a high quality of health services (Martinez and Oddone 2008).

Access and use of internet to seek health related information among medical doctors is important to provide a high quality of health services and to solve various health issues (Martinez and Oddone 2008). A study by Jackson et al. (2007) on the information-seeking behaviours of health and social care professionals in Barnsley, England, showed that the internet had high use among professionals, followed by informal networks such as verbal queries to colleagues, libraries or written resources.

A researcher (2008) argues that e-mail can be more efficient for physicians as it is asynchronous. Physicians can take their time crafting responses to patient questions and communicate when it is most convenient for them. Patients can read and re-read information at their own convenience, even sharing it with loved ones. This increases satisfaction and retention of information.

Ya-Wen Chiu et al (2009) say internet-based resources, web portals, online databases, and electronic journals were more often accessed by physicians to look for medical information than personal or paper ones. Almost universally, physicians have accessed online databases. Furthermore, physicians under 50 years of age tended to access online databases more often than their elder colleagues. Janelle et al quoted in a report that social media has enormous potential for both physicians and their patients. It can be used to disseminate information and forge meaningful professional relationships. However, these benefits must occur within the proper framework of professional ethics.

A researcher (2008) explains that it is easy to provide extra information through e-communication. Physicians can include links to reliable web-based information on particular medical conditions or attach documents explaining a condition in

more detail. Some systems include customizable template responses to common patient questions. The patient has an opportunity to learn about the condition, but the physician only has to invest a few seconds in providing that information.

As many doctors spend lots of time in social media, Mary Modahl (2010) indicates that, physicians are highly engaged with online networks and social media and nearly 65% for professional purposes. Overall, clinicians express significant interest in the potential applications of social media to their professions – whether via online physician communities, online patient communities or sites that could facilitate physician-patient interactions.

James Wooten (2012) in his study explains that the overall amount of medical information is growing at an alarming rate; even the body of knowledge covering only drug information seems to be endless. There are vast amounts of data on drugs that are approved by the Food and Drug Administration (FDA), and on agents undergoing clinical investigation. There are many sources of information available on internet that can help the medical practitioners to get the answers for drug-related questions. Deciding which one is best for a specific situation is the key.

Meredith Ringel et al (2009) in their research case study found out that the doctors described several scenarios in which they used Web search while in the room with a patient in order to research a treatment or condition. Dan Morris et al (2011) indicate that doctors mentioned that Google's Image Search feature was useful in diagnosing rashes and compare the images to the patient's rash. She noted that this method was preferable to using a reference book since the reference books typically contained only a couple of pictures of each rash, whereas the Web search returned a much larger sample set that would better account for variations she might see.

Rowena Sobczyk (2002) denotes that Internet is changing the way one practices medicine. Patients want to communicate with their physicians using e-mail and are willing to change doctors to get this service (1). Unlike the telephone consultation, an online consultation is structured and provides automatic documentation. It is estimated that 20% of all office visits could be handled over the internet.

The main objective of the present study is to investigate the internet usage in the field of medicine by medical professionals and to find out whether they face any hurdles in using them professionally.

III. RESEARCH METHODOLOGY

In this study the researcher aims to investigate the internet usage among the medical practitioners for their profession. Hence, the following research questions are mooted in this study so as to understand how the medical practitioners use internet as a tool in the field of medicine and accordingly research questions are generated below.

1. Do medical practitioners prefer to use internet as an informative tool for accessing information?
2. Is there any difference in using internet according to their work sector?
3. Do medical practitioners prefer to use internet as a communicative tool?
4. Do doctors use internet to access online database systems?

To answer the above research questions and to understand those intricacies, the researchers developed an attitude scale so as to measure those factors which are taken for the study.

The researchers used gender, age, education and occupation as independent variables and usage of internet as a dependent variable.

For the study the researchers selected three categories of medical professionals: those working in government hospitals, private hospitals and those having their own clinic. With this, the researcher collected a total sample from 238 respondents. After careful scrutiny it was found that some of the respondents did not answer some of the questions and some of the items were incomplete. After removing those incomplete samples, the final tally of respondents included in the study is 209.

IV. FINDINGS AND DISCUSSION

The data gathered were fed into IBM SPSS Statistics software and the following statistical methods were applied for desired results. Here is the sample characteristics derived based on the demographic variables chosen for the study.

Table 1.1

Gender * Age Cross-tabulation				
	25-35	36-45	46 and Above	Total
Male	52	43	11	106
Female	46	36	21	103
Total	98	79	32	209

According to the cross tabulation table above, it is projected that there are 106 male respondents out of 209 samples selected for the study, in which 52 respondents belong to the age group of 25 to 35 years, 43 male respondents belong to the age group of 36 to 45 years. 11 male members belong to the age group of 46 and above. When it comes to female respondents, there are 103 female respondents in the age group of 25 to 35 years and 46 female samples belong to 36 years to 45 years. 21 respondents belong to the age group of 46 and above.

Table 1.2

Education * Occupation Cross-tabulation				
	Government	Private	Own Clinic	Total
Ug	34	23	12	69
Pg	35	39	13	87
Others	9	30	14	53
Total	78	92	39	209

The above table reveals the occupation and educational qualification of the respondents for the study. Out of 209 samples 78 respondents belong to government sector, 92 respondents work in private hospitals and 39 respondents have their own clinic; considering their education qualification 69 members have under graduation, in which 34 work in government hospitals, 23 work in private hospitals and 12 established their own clinic. 87 respondents have done their post-graduation in which 35 of them work in government sectors, 39 respondents are in private and 13 have their own clinic. Out of 209 respondents, 53 of them have studied above post-graduation and among them 9 of them work in government hospitals, 30 work in private hospitals and 14 of them have their own clinics.

Table 1.3

Table of ANOVA for all the 10 items in terms of occupation										
Independent variables	S- Engine	E-Mail	Online Data Base	Social Network	Weblog	Website	Online Journal	Job - Search	Appointment	Drug
Occupation	F=8.781 Sig. =.000	F=.551 Sig. =.577	F=3.173 Sig. =.044	F=.542 Sig. =.582	F=1.367 Sig. =.257	F=.403 Sig. =.669	F=5.451 Sig. =.005	F=2.023 Sig. =.135	F=3.914 Sig. =.021	F=2.579 Sig. =.078
Independent variables	S- Engine	E-Mail	Online Data Base	Social Network	Weblog	Website	Online Journal	Job - Search	Appointment	Drug
Government	NV =78 MV =3.32	NV =78 MV =3.78	NV =78 MV =2.95	NV =78 MV =3.77	NV =78 MV =3.10	NV =78 MV =3.78	NV =78 MV =3.73	NV =78 MV =2.27	NV =78 MV =2.96	NV =78 MV =3.90
Private	NV =92 MV =3.70	NV =92 MV =3.89	NV =92 MV =2.58	NV =92 MV =3.79	NV =92 MV =2.80	NV =92 MV =3.79	NV =92 MV =3.60	NV =92 MV =2.47	NV =92 MV =2.58	NV =92 MV =3.90
Own Clinic	NV =39 MV =2.77	NV =39 MV =3.72	NV =39 MV =2.38	NV =39 MV =3.59	NV =39 MV =2.79	NV =39 MV =3.62	NV =39 MV =3.05	NV =39 MV =2.03	NV =39 MV =2.33	NV =39 MV =3.44
Total	NV =209 MV =3.38	NV =209 MV =3.82	NV =209 MV =2.68	NV =209 MV =3.75	NV =209 MV =2.91	NV =209 MV =3.76	NV =209 MV =3.55	NV =209 MV =2.31	NV =209 MV =2.67	NV =209 MV =3.81
Occupation	S- Engine Std.D	E-Mail Std.D	Online Data Base Std.D	Social Network Std.D	Weblog Std.D	Website Std.D	Online Journal Std.D	Job - Search Std.D	Appointment Std.D	Drug Std.D
Government	1.253	1.040	1.318	1.068	1.364	1.065	.989	1.245	1.243	.920
Private	1.087	.955	1.277	1.144	1.286	1.153	1.130	1.143	1.277	1.258
Own Clinic	1.180	.686	1.067	.751	1.031	.963	1.075	1.088	1.084	1.294
Total	1.212	.943	1.270	1.051	1.276	1.084	1.092	1.178	1.248	1.160

The ANOVA was significant, $F(2, 425) = 8.7, p < .05$. Thus there is a significant difference in usage of search engine in internet by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = .55, p < .05$. Thus there is a significant difference in usage of internet for sending e-mail by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = 3.1, p < .05$. Thus there is a significant difference in usage of online database management by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = .54, p < .05$. Thus there is a significant difference in usage social network by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = 1.36, p < .05$. Thus there is a significant difference in usage of weblogs by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = .40, p < .05$. Thus there is a significant difference in usage of website by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = 5.4, p < .05$. Thus there is a significant difference in usage of online journals by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = 2.02, p < .05$. Thus there is a significant difference in usage of internet for job search by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = 3.91, p < .05$. Thus there is a significant difference in usage of internet to give appointment by doctors based on their occupation. The ANOVA was significant, $F(2, 425) = 2.5, p < .05$. Thus there is a significant difference in usage of internet for searching information related to drugs by doctors based on their occupation.

V. DISCUSSION AND CONCLUSION

The results of the research explores that doctors who are working in private hospitals use search engines on a higher level when compared with doctors working in government sectors and those who practice on their own. Manhattan Research (2009) put the number at 89% of physicians who use the Internet for health information. G. De Leo, Cynthia Le Rouge (2006) study demonstrated that a vast majority of physicians indicate they utilize search engines (such as Google) to gather medical information.

Doctors working in private hospitals use internet mostly for communicating with others through e-mails when comparing with doctors in other sectors. Steven and Cheryl (2003) conclude in their study that e-mails appear to be an “add-on” for communication.

According to the results of the study doctors who are working in government hospitals use online database system effectively when compared to other doctors in private hospitals and those who practice on their own. Avula Tejaswi, Nela Manoj Kumar et al (2012) say: online database is widely used by doctors and this technology introduces an easy way to cure patients, if any new disease occurred. Cloud computing will create a major impact on medicine, and contribute to an overall improvement in its quality.

Access of social networking sites is more frequent among the doctors who are working in private sectors while comparing with the other doctors who work under various other sectors. Mary Modahl (2011) explored in his study that 42% of practicing physicians had used social networking sites in which 90% for personal reasons and 65% for professional activities.

When it comes to weblogs, the government doctors play a dominant role in accessing weblogs more often when compared with the doctors in private and own practitioners and doctors who are working in private sectors have more access to websites while comparing with the government sector doctors. Margatet Maag (2004) explains weblogs weblogs, and websites are an emerging writing tool for promoting writing skills for health professionals. G. De Leo, Cynthia Le Rouge's (2006) study demonstrated that a vast majority of physicians indicate they access a targeted website to gather medical information.

Government doctors use the online journals as sources of information for their profession while comparing with the private doctors and doctors who practice on their own. K. Ann McKibbin et al (2007) denote that primary care physicians, more so than specialists, chose full-text articles from clinical journals deemed important by several measures of value.

Most private doctors look for frequent jumps from one place to another for their jobs and the results denote the same. Victoria Stagg Elliott (2009) says internet has become such a huge player in recruitment, not just for doctors but for everybody. According to her study in a recent survey of 166 recruiters at hospitals and physician groups it was found that most rely heavily on internet job postings.

For Appointments and drug related information the government doctors use the internet most when comparing to the doctors working in private sectors and those practicing on their own. Nazia and Ekta Sarda (2014) explore that one of the

biggest reasons that online appointment scheduling is getting popular. It proves easier when one moves through computers, accesses a website or software and makes an appointment and through this, patients can also involve in the health decisions that they have to make. They can make an appointment with another doctor other than theirs, by nothing more than a click.

According to the results of the study there is a significant usage of internet among the medical doctors. Doctors often surf the new media for information. When it comes to the work place, doctors working in private hospitals use the new media slightly highly compared to the government doctors, but the doctors having their own clinic use the new media very less compared to the others. This may be because the doctors in clinics do not handle serious cases as the government and private doctors do. The usage of internet for communication purpose is more or less equally shared by every doctor and this denotes that each of them is using internet for the basic necessity, which is for sending and receiving mail. Online database system is also commonly used by the doctors for storing various details such as study materials, patient history, etc. On the whole, the usage of internet among the medical professionals is more common for various reasons.

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